

# Waterline FEIS Addendum – Meliadine Mine

*Information Request Responses*



Submitted to:  
**Nunavut Impact Review Board**

Submitted by:  
**Agnico Eagle Mines Limited – Meliadine Division**

October 13, 2020

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## **Table of Contents**

<b>CROWN-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA (CIRNAC)</b> .....	<b>1</b>
<b>ENVIRONMENT AND CLIMATE CHANGE CANADA (ECCC)</b> .....	<b>26</b>
<b>FISHERIES AND OCEANS CANADA (DFO)</b> .....	<b>29</b>
<b>GOVERNMENT OF NUNAVUT (GN)</b> .....	<b>33</b>
<b>HEALTH CANADA (HC)</b> .....	<b>50</b>
<b>KANGIQLINIQ HUNTERS AND TRAPPERS ORGANIZATION (KHTO)</b> .....	<b>56</b>
<b>KIVALLIQ INUIT ASSOCIATION (KIVIA)</b> .....	<b>59</b>
<b>KIVALLIQ WILDLIFE BOARD (KWB)</b> .....	<b>81</b>
<b>NUNAVUT IMPACT REVIEW BOARD (NIRB)</b> .....	<b>109</b>
<b>TRANSPORT CANADA (TC)</b> .....	<b>150</b>

## **List of Appendices**

Appendix IR-1	Hydraulic and Transient Conditions Study Meliadine Project
Appendix IR-2	Impact Assessment of the Diversion of Site Runoff to Melvin Bay on the Flow and water Level Regimes in Meliadine Lake Rev1
Appendix IR-3	P&ID
Appendix IR-4	Design Drawings
Appendix IR-5	HDPE Pipe Specification
Appendix IR-6	Waterline Layout with Covered Sections
Appendix IR-7	Waterline Installation Along All-weather Access Road
Appendix IR-8	Anticipated Ecosystem and Socio-economic Impacts Associated with Covering the Waterline
Appendix IR-9	Melvin Bay Hydrodynamic Modelling and Characterization of the Fate and Behaviour of the Discharged Saline Effluent
Appendix IR-10	2019 Updated Prediction of Groundwater Inflow to Tiriganiaq Underground Mine
Appendix IR-11	Literature Review of Caribou, Waterlines, and Roads

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Appendix IR-12	Anticipated Ecosystem and Socio-economic Impacts Associated with the Alternative Discharge Scenario of 20,000 m <sup>3</sup> /day
Appendix IR-13	Predictive Noise Effects Assessment: Construction of the Rankin Inlet By-Pass Road and Associated Activities in Itivia Quarry
Appendix IR-14	WMC International Ltd., Meliadine West Gold Project, Traditional Ecological Knowledge Study, Final Report
Appendix IR-15	Meliadine Pipeline Construction Feasibility Report
Appendix IR-16	Calculation Note Daily Greenhouse Gas Emission Estimate

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**CROWN-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA  
(CIRNAC)**

<b>Interested Party:</b>	<b>CIRNAC</b>	<b>Rec No.:</b>	<b>CIRNAC-IR-1</b>
<b>Re:</b>	<b>Scope of Treated Groundwater Effluent Discharge into Marine Environment</b>		

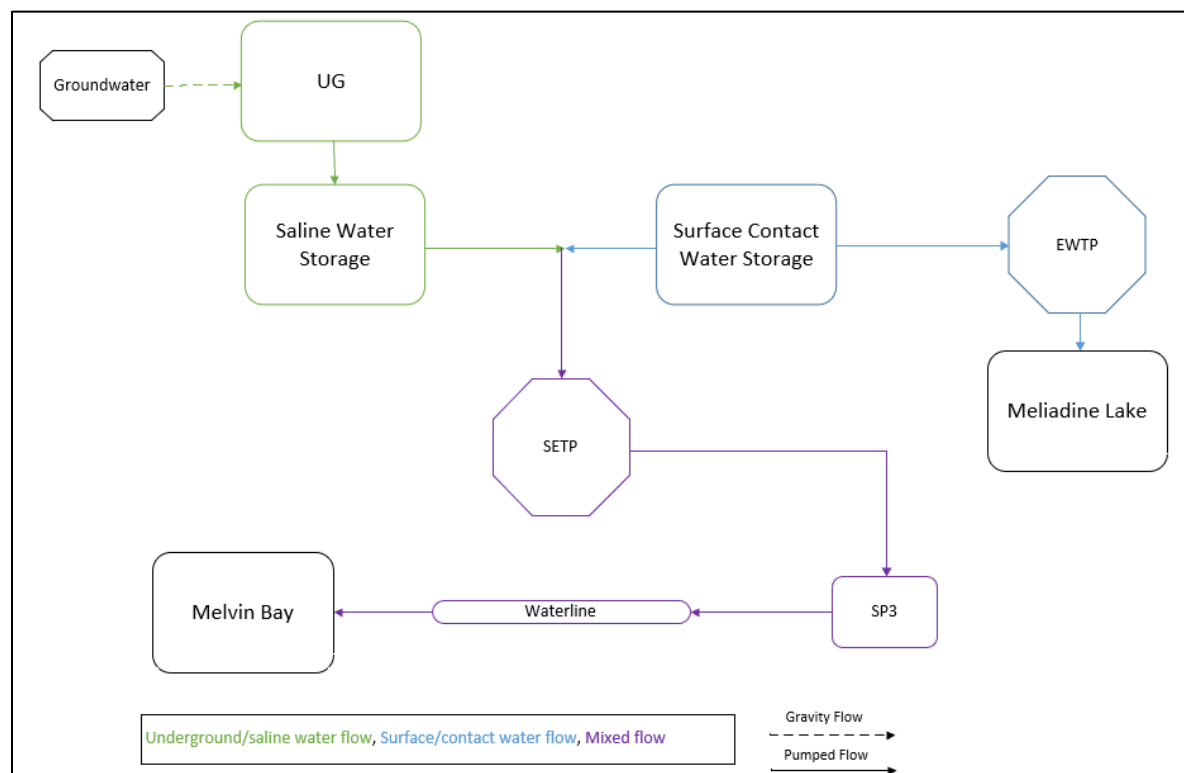
**Recommendation Made by Interested Party:**

*CIRNAC requests that:*

- a) AEM confirm if only treated saline groundwater will be conveyed through the waterlines and discharged directly from the treatment facilities into the waterlines for conveyance to and discharge within Melvin Bay;*
- b) Alternatively, AEM should provide information on other additional arrangements.*

**Agnico Eagle's Response to Recommendation:**

Various contact water sources at site – including Underground (Saline) and Surface Contact Water – are combined, at times, to minimize overall site footprint and to support long-term environmental management at site. The combined flows of Saline and Surface Contact Water will be pumped to the Saline Effluent Treatment Plant (SETP) for treatment prior to discharge to the waterline. The flow diagram below (Figure CIRNAC-IR-1a), adapted from the flow diagram provided in the August 2020 FEIS Addendum to include saline and contact water management, presents this concept. This flow diagram is consistent with the one presented in Saline Effluent Treatment Plant Design Report (Agnico Eagle 2020) approved by NWB on September 9, 2020.



**Figure CIRNAC-IR-1a: Waterline conceptual flow diagram**

*EWTP = Effluent Water Treatment Plant; SETP = Saline Effluent Treatment Plant; SP = Storage Pond UG = Underground*

<b>Interested Party:</b>	<b>CIRNAC</b>	<b>Rec No.:</b>	<b>CIRNAC-IR-2</b>
<b>Re:</b>	<b>Water Treatment System Performance</b>		

**Recommendation Made by Interested Party:**

*CIRNAC requests that AEM provide information:*

- a) That AEM's current water treatment practices are able to achieve their design intent;*
- b) That reasonable steps AEM have been taking to rectify the situation prior to proposing the amendment;*
- c) If AEM had experienced any prior water treatment / management challenges at the site and how those challenges have been rectified.*

**Agnico Eagle's Response to Recommendation:**

The following table presents the status of water treatment plant performance onsite, as well as challenges at the site and how those challenges have been rectified.

<b>Plant</b>	<b>EWTP</b>	<b>SWTP</b>	<b>SETP</b>	<b>RO</b>	<b>STP</b>
<b>Design Flow rate (m<sup>3</sup>/day)</b>	Max 28 000 m <sup>3</sup> /day <sup>1</sup>	120 m <sup>3</sup> /day	Max 1600 m <sup>3</sup> /day after upgrade	2000 m <sup>3</sup> /day approximately <sup>3</sup>	216 m <sup>3</sup> /Day upgraded to 299 m <sup>3</sup> /day
<b>Status</b>	Operational	Non-operational <sup>2</sup>	Operational	Operational	Operational
<b>Next action</b>	Non-applicable	Planning the decommissioning of the plant <sup>4</sup>	Upgrade ongoing	Periodic membrane change	Upgrade ongoing
<b>Inspection/follow-up during the operation</b>	Several inspections by operator daily to follow up the process of all water-treatment plant. Operators are dedicated to these plants.				
<b>Notes</b>	<p><sup>1</sup> Maximum hydraulic design of clarification system</p> <p><sup>2</sup> Root cause of low efficiency:</p> <ul style="list-style-type: none"> <li>• The technology isn't as efficient as expected in Arctic climates;</li> <li>• In wintertime, safety issues were brought forward due to generation of vapor;</li> <li>• The field TSS concentration negatively affects the system and increases the downtime period;</li> <li>• The sole filtration system mesh wasn't appropriate to contain salt efficiently;</li> <li>• The crusting phenomenon inside the SWTP was higher than expected and led to increased downtime period and intensive cleaning efforts.</li> </ul> <p>As short-term solutions, a microfilter was added to the bag filtration system, the packing was changed to Teflon, but the SWTP still experienced a major derating (range 0 to 82 m<sup>3</sup>/day, average 39 m<sup>3</sup>/day in steady state operation when it was supposed to operate at 120 m<sup>3</sup>/day).</p> <p><sup>3</sup> Depend on feed water TDS and recovery required (design between 1400 and 10,000 mg/L TDS)</p> <p><sup>4</sup> The capacity of the SWTP is not a solution for long term saline water management due to the very low capacity of the plant compare to underground inflow prediction.</p>				

<b>Interested Party:</b>	<b>CIRNAC</b>	<b>Rec No.:</b>	<b>CIRNAC-IR-3</b>
<b>Re:</b>	<b>Maximum Proposed Discharge Volume of the Waterlines System</b>		

**Recommendation Made by Interested Party:**

*CIRNAC requests that AEM:*

- a) Clarify whether it is proposing a maximum discharge rate of 12,000 m<sup>3</sup>/day or 20,000 m<sup>3</sup>/day;*
- b) Explain the design basis and calculations supporting its proposed maximum discharge rate;*
- c) Confirm whether the current effects assessment has considered impacts associated with discharge rates of up to 20,000 m<sup>3</sup>/day; and*
- d) Clarify the rationale of using 16-inch diameter pipes and provide calculations demonstrating the maximum carrying capacity of these two 16-inch diameter waterlines.*

**Agnico Eagle's Response to Recommendation:**

**Part A**

Agnico Eagle is requesting a maximum discharge rate of 12,000 m<sup>3</sup>/day in this application. Within the application there is an alternative to divert additional surface water to the water line for an additional 8,000 m<sup>3</sup>/day for a total capacity of 20,000 m<sup>3</sup>/day.

**Part B**

Agnico Eagle elected to use 16-inch diameter pipe based on preliminary calculation indicating that may need to convey flow up to design flow of 20,000 m<sup>3</sup>/day in the future. A detailed engineering calculation table found in the Appendix IR-1 show that each line can convey up to 11,500 m<sup>3</sup>/day and stay within the rated pressure of 16-inches HDPE DR17 PE4710 pipe which is 125 psi. The first table in the Appendix IR-1 also shows that the combined flow can reach up to 20,000 m<sup>3</sup>/day and stay within the max rated pressure of 125 psi.

**Part C**

The current assessment does not include an assessment of the 20,000 m<sup>3</sup>/day as this is presented only as potential longer-term alternative. However, the NIRB requested an assessment of 20,000 m<sup>3</sup>/day and this is provided in NIRB-IR-1-August27.

**Part D**

As described in Section 3.4.2 (Agnico Eagle 2020), Agnico Eagle evaluated the benefits and disadvantages of using one or two waterlines for the conveyance of treated effluent. Two waterlines were selected for the following reasons:

- Two 16-inch diameter waterlines would be easier for snowmobiles and ATVs to cross than one larger waterline, based on feedback from consultation and engagement sessions;
- Two 16-inch diameter waterlines would be easier for caribou to cross than one larger waterline from the perspective of a physical barrier, based on feedback from consultation and engagement sessions;

3. A contingency for redundancy in the event of a malfunction or an accident with one of the waterlines;
4. Allows for maintenance on one waterline while the other still functions;
5. Provides more flexibility in how daily volumes of treated effluent is moved from the mine to the ocean; and
6. Provides for future potential increases in treated effluent without requiring additional infrastructure and disturbance, in the event this is required.

The maximum carrying capacity of two 16-inch waterlines is 20,000 m<sup>3</sup>/day (i.e., 10,000 m<sup>3</sup>/day in each line).



<b>Interested Party:</b>	<b>CIRNAC</b>	<b>Rec No.:</b>	<b>CIRNAC-IR-4</b>
<b>Re:</b>	<b>Water and Load Balance Conceptual Model</b>		

**Recommendation Made by Interested Party:**

*CIRNAC requests that AEM provide a conceptual Water Quality and Load Balance Model. The model should indicate all proposed changes relative to the currently approved project.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle considers that the information provided as part of the Meliadine Saline Water Balance and Water Quality Model – Saline Water Management (Golder, 2020) fulfil the requirement to complete the assessment of the Project. The Saline Effluent Discharge to Marine Environment Project focus primary on the change of conveyance of the saline water to marine environment and Agnico Eagle does not expect change in the composition of the water quality of the effluent to the Melvin Bay as:

- No change is observed on the saline water quality stored on site;
- No change is observed on the groundwater quality reporting to the underground mine, and;
- No change on the water treatment process is proposed, only an increase in the SWTP capacity to accommodate the higher discharge volume.

The water management strategy on site has not changed: various contact water sources at site – including saline and surface water – are combined at times and pumped to the Saline Effluent Treatment Plant (SETP) for treatment prior to discharge to Melvin Bay. This is done to minimize overall site footprint and to support long term environmental management at site. What has changed is that due to higher than originally anticipated groundwater flows to the underground, more water must be managed on site, requiring increased discharge to Melvin Bay. Simplified flow diagrams of the current and proposed water management strategy, adapted from the August 2020 FEIS Addendum, are shown below to illustrate with the difference in bold.

Updates to the water volumes and water quality due to the waterline flows are described in the Melvin Bay diffuser design document (Appendix A of the August 2020 FEIS Addendum) and the saline water balance document (Appendix H of the August 2020 FEIS Addendum). The potential impacts on water quantity to Meliadine Lake are described in Appendix IR-2 of the response package.

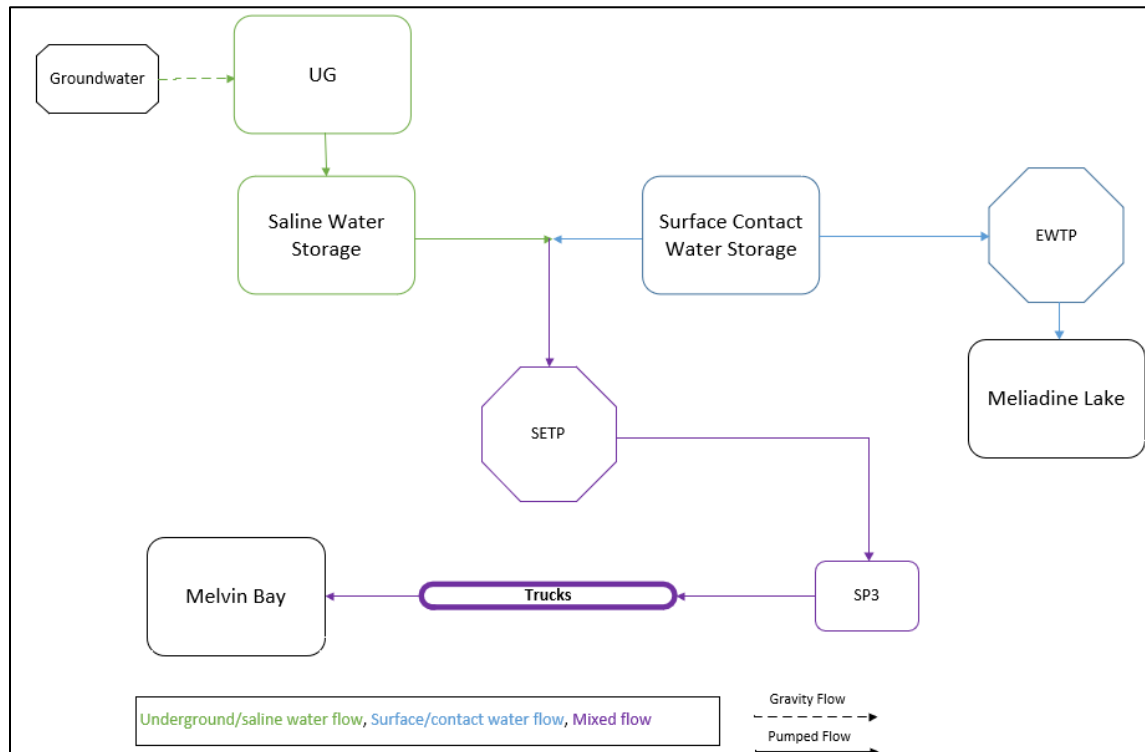


Figure CIRNAC-IR-4a: Current conceptual flow diagram

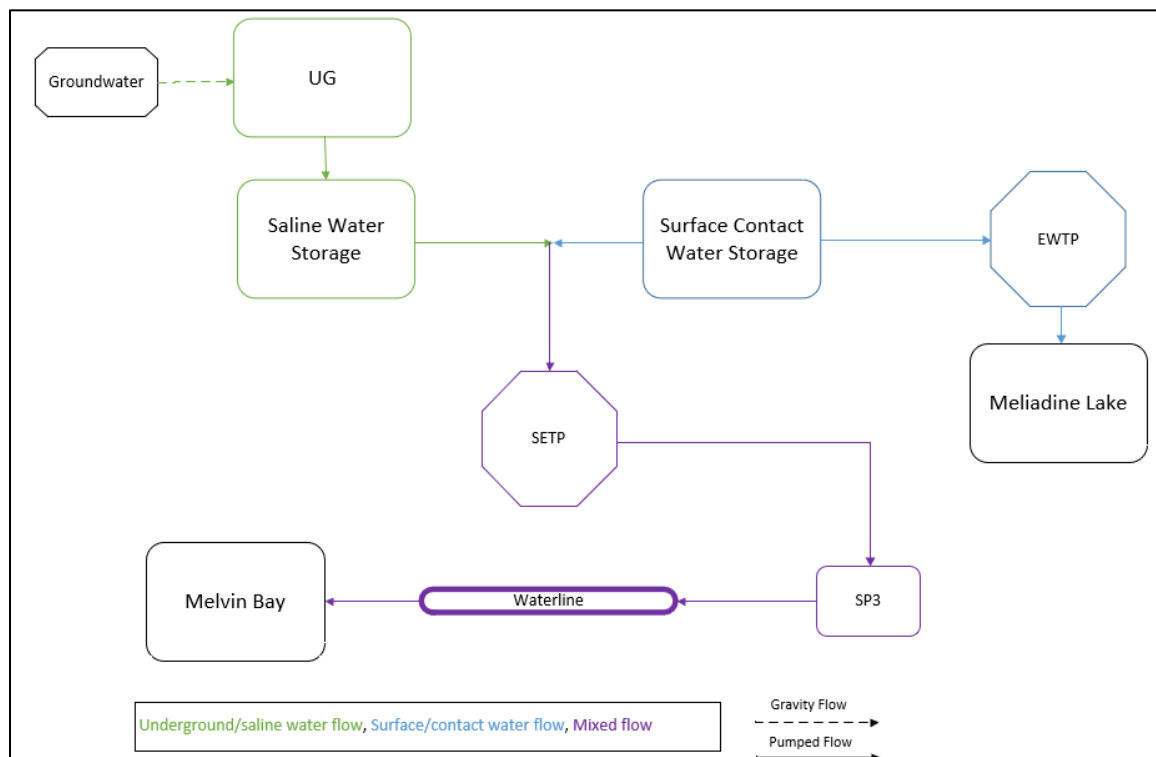


Figure CIRNAC-IR-4b: Proposed Waterline conceptual flow diagram

<b>Interested Party:</b>	<b>CIRNAC</b>	<b>Rec No.:</b>	<b>CIRNAC-IR-5</b>
<b>Re:</b>	<b>Process Modifications to Avoid Non-Compliance Issues</b>		

**Recommendation Made by Interested Party:**

*CIRNAC requests that based on AEM's previous experiences, AEM describe how potential non-compliant events will be detected and proactively mitigated in the future.*

**Agnico Eagle's Response to Recommendation:**

The transportation of water through the waterline differs from the current situation (transportation by truck). Water quality will be monitored for several parameters, such as for conductivity, chlorine, and turbidity, within the water treatment plant and prior to pumping to the waterline. In case of parameters exceeding the operational targets, the discharge will be stopped and water will be recirculated to the saline storage area at the mine site by opening the recirculation valves to redirect water to the saline storage area and closing the discharge valve. Then, treatment will be optimized to comply with discharge criteria before resuming the discharge.

<b>Interested Party:</b>	<b>CIRNAC</b>	<b>Rec No.:</b>	<b>CIRNAC-IR-6</b>
<b>Re:</b>	<b>Deposition of Total Suspended Solids Inside Waterlines</b>		

**Recommendation Made by Interested Party:**

*CIRNAC requests that AEM clarify if and how the potential for inline deposition of TSS factored into the design of the proposed amendment. This should include: 1) operational conditions, 2) design velocities, 3) accumulation in topographic depressions and 4) residual sediments removal.*

**Agnico Eagle's Response to Recommendation:**

The system can be operated following different modes, with 1, or 2 pumps running and with one or two lines running in parallel (Appendix IR-3). With that flexibility, possible TSS accumulation can be managed. In the Appendix IR-1, summarize flow velocities. As the system can operate on one or two lines, minimal velocity can be maintained in the circuit to keep TSS from settling. Risk of accumulation in depression is reduced doing so. Design also includes required equipment to pig both whole lines, not only will pigging flush the line but it will also descale what may have settled from a low velocity.

<b>Interested Party:</b>	<b>CIRNAC</b>	<b>Rec No.:</b>	<b>CIRNAC-IR-7</b>
<b>Re:</b>	<b>Discharge Season for Treated Groundwater Effluent at Melvin Bay</b>		

**Recommendation Made by Interested Party:**

*CIRNAC requests that AEM clarify the assumed duration of the icefree season and the number of days in the design for discharges to Melvin Bay.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle assumed 102 ice-free days and 85 days of operation of the system. These 17 days of contingency allows for maintenance and uncertainties regarding the commencement of the discharge.

Interested Party:	CIRNAC	Rec No.:	CIRNAC-IR-8
Re:	Incremental Marine Impacts from Treated Groundwater Effluent Discharge and Monitoring		

#### Recommendation Made by Interested Party:

*CIRNAC requests that AEM:*

- a) Present side-by-side comparisons of effluent dispersion modelling for the approved project and the proposed amendment;*
- b) Describe pathways related to the planned discharges to the marine environment through the effects assessment, even if designated as “Minor” by AEM;*
- c) Submit a revised Water Quality and Flow Monitoring Plan that is commensurate with the significant increase in proposed discharge to the marine environment of Melvin Bay.*

#### Agnico Eagle’s Response to Recommendation:

##### Part A

The effluent modelling conducted as part of the Approved Project was presented in Appendix F of the Final Environmental Impact Statement (Agnico Eagle 2018). The effluent modelling conducted as part of the proposed amendment was submitted in Appendix A of the August 2020 FEIS Addendum.

A comparison of ambient conditions characterizing Melvin Bay, discharge parameters, and plume behavior is presented in Table CIRNAC-IR-8. Aside from the increase in discharge flow rate, all conditions/parameters are similar between the approved project and proposed amendment. Where appropriate, ambient condition and discharge data were updated to reflect a range of expected conditions.

In addition to the reference of MDMER end of pipe discharge limits, a more stringent dilution criterion for the proposed amendment was applied than used in the approved project: that is, a maximum change of +/- 10% in ambient chloride concentration at the edge of the mixing zone was used, which established a conservative dilution target of 11:1 for the proposed amendment (based on the differential between the potential discharge effluent chloride concentration relative to the ambient chloride concentration). The modelling confirmed that a minimum dilution target (11:1) as it applies to the chloride criterion is reached by the edge of the mixing zone. In addition, all other non-major ion constituents (nutrients, metals) will also be effectively dispersed and attenuated by a constituent-specific dilution factor that is expected to be much greater than 11:1.

**Table CIRNAC-IR-8: Effluent Dispersion Modelling – Approved Project and Proposed Amendment**

Parameter	Approved Project	Proposed Amendment
<b>Ambient Conditions</b>		
Ocean Current Speed (m/s)	0.01 / 0.20	0 / 0.05 / 0.25 / 0.40
Ocean Water Temperature (°C)	0.0	-1.9 / 0.0 / 5.8 / 8.5
Ocean Salinity (mg/L)	29,300	30,800 / 33,000
<b>Discharge Parameters</b>		
Discharge Depth (m)	20	20
Diffuser Type	Single Port	Multiport (5 ports)
Diffuser Pipe Diameter (inches)	4" DR11	12" DR11
Flow Rates (m <sup>3</sup> /day)	420 / 800	6,000 / 12,000 / 20,000
TDS (mg/L)	37,700	39,600
Effluent Temperature (°C)	0	0 / 2 / 5 / 10 / 20
<b>Plume Behaviour</b>		
Target Dilution	3: 1	11: 1
Target Dilution Achieved at the Edge of the Mixing Zone	Yes	Yes
Maximum Plume Height (m above diffuser)	13.7	12.1

## **Part B**

The pathway to potential environmental effects related to discharge to the marine environment was listed as minor because measurable effects to water quality are not expected at the edge of the mixing zone. Based on the dispersion modelling described in Part A) and Appendix IR-9, the treated effluent discharged to Melvin Bay through an engineered diffuser will be effectively dispersed well within the mixing zone. As noted in Section 8.1.1, a minor pathway is defined as a minor environmental change that would have a negligible residual effect on VECs and VSECs or the associated habitat relative to baseline or guideline values; a minor pathway is not carried through the effects assessment. In contrast, a primary pathway is defined as likely to result in a measurable environmental change that could contribute to residual effects on VECs and VSECs or the associated habitat relative to baseline or guideline values. The results of the dispersion model indicate that measurable effects to water quality will be localized to the mixing zone, and therefore, based on the definition of a primary pathway provided above, saline discharge to Melvin Bay is not a primary pathway.

As stated in Section 3.3. of the August 2020 FEIS Addendum (Agnico Eagle 2020), treated effluent will be required to comply with discharge criteria at the end of pipe. From measured groundwater data (refer to IR-NIRB-17), the water quality of the discharge is expected to remain consistent with regulated end of pipe limits (e.g., MDMER limits, and the discharge not being acutely toxic). Further, the treated effluent quality is expected to remain within parameter ranges projected by the 2018 FEIS Addendum (Agnico Eagle 2018) and is therefore not anticipated to present any supplemental risk to the receiving

environment than assessed in the 2018 FEIS Addendum. Subsequently this has a negligible residual effect to marine VECs (habitat and biota) and is thus a minor pathway.

### **Part C**

The Water Quality and Flow Monitoring Plan is a requirement of the Nunavut Water Board under Type A Water Licence 2AM-MEL1631, which regulates monitoring in Meliadine Lake and water management at the mine site. As noted by NIRB in their letter dated September 28, 2020, the Project Certificate amendment for a waterline and increased discharge to the marine environment includes activities that do not require amendments to the Water Licence 2AM-MEL1631. Therefore, it is not necessary to update the Water Quality and Flow Monitoring Program. Monitoring activities (e.g., water quality field measurements and collection of water samples for chemical analysis) will be undertaken in Melvin Bay as part of the Ocean Discharge Monitoring Program (Appendix F, Agnico Eagle 2020), which was submitted as part of the amendment to the Project Certificate.

In response to the statement that the maximum flow rate of 12,000 m<sup>3</sup>/day is a significant increase in discharge, Agnico Eagle respectfully disagrees because of the size and volume of Melvin Bay (approximately 55 Mm<sup>3</sup> of water, i.e. 55,000,000 m<sup>3</sup>) relative to the annual volume of discharge, and therefore the assimilative capacity of the receiving environment in which the discharge is occurring with thousands of cubic metres of water being exchanged and renewed on a daily basis due to daily tidal movement. This statement is supported by a detailed three-dimensional hydrodynamic dispersion modelling completed by Tetra Tech (Appendix IR-9) that indicates that the discharge will be effectively dispersed via an engineered diffuser into Melvin Bay well within the 100 m mixing zone. The excellent flushing capacity of the bay, primarily due to tides, results in no residual accumulation of effluent on a year-by-year basis.

### **References**

- Agnico Eagle. 2018. Meliadine Gold Mine – Final Environmental Impact Statement Addendum, Environmental Assessment of Treated Groundwater Effluent Discharge into Marine Environment, Rankin Inlet. June 2018.
- Agnico Eagle. 2020. Meliadine Gold Mine – Final Environmental Impact Statement Addendum, Environmental Assessment of Treated Groundwater Effluent Discharge into Marine Environment, Rankin Inlet. August 2020.



<b>Interested Party:</b>	<b>CIRNAC</b>	<b>Rec No.:</b>	<b>CIRNAC-IR-9</b>
<b>Re:</b>	<b>Waterline Failure Modes and Effects Assessment</b>		

**Recommendation Made by Interested Party:**

*CIRNAC requests that AEM identify potential failure modes in the system and their causes and effects for the proposed amendment.*

**Agnico Eagle's Response to Recommendation:**

At this time Agnico Eagle has not completed a failure modes analysis of the system; however, below is an assessment of the potential outcome of an accident or malfunction.

Table CIRNAC-IR-9 provides a list of potential accidents and malfunctions and identified mitigation measures related to the waterline. Given the level of engineering completed to date, the likelihood and potential outcome should be interpreted qualitatively.

**Table CIRNAC-IR-9: Summary of Accidents and Malfunctions**

<b>Accident or Malfunction</b>	<b>Mitigation</b>	<b>Consequence</b>	<b>Likelihood</b>
Failure of the covered/buried portions of the waterline	Buried/covered Regular internal inspections Leak detection system, such as a pressure drop sensor Designed for corrosion protection and freeze/thaw consistent with northern environments. Spill Contingency Plan	Dependent on the location and the size of the leak or spill from the waterline the consequence can be limited and localized with no to limited detectable impacts. A reasonable worst case scenario is localized measurable impacts to fish and fish habitat if the spill or leak was to occur over a river or localized measurable impacts to soils, terrain and vegetation on land.	The likelihood of small leaks with limited to no detectable effect could occur at some point during the mine life. The chance of a large leak going undetected and causing harm to fish or wildlife is low.
Failure of exposed waterline	Regular internal inspections. Leak detection system, such as a pressure drop sensor Designed for corrosion protection and freeze/thaw consistent with northern environments. Emergency response plan	A reasonable worse case scenario would be a measurable reversible impact on valued components.	
Spills during construction from construction equipment	Trained drivers Speed restrictions Regular maintenance Emergency response plans Spill Response Plan	These spills are expected to have limited impacts on the environment due to the detection time and ability to contain the spill.	The likelihood of small spills with limited to no detectable effect could occur at some point during the mine life.
Sabotage of the waterline	80% to 90% of the line is buried/covered Regular internal inspections Leak detection system, such as a pressure drop sensor Emergency response plan	Dependent on the location of the sabotage the consequence can be limited and localized with no to limited detectable impacts to localized measurable impacts to fish and fish habitat (including localized loss of fish)	Sabotage to the waterline could occur during the mine life.

Accident or Malfunction	Mitigation	Consequence	Likelihood
		and wildlife, vegetation, soils terrain and permafrost. A reasonable worst case scenario would be a measurable reversible impact on valued components.	
Sloughing below the waterline	Regular internal inspections HDPE can tolerate a certain amount of movement without failing	Measurable change in terrain, soils and permafrost.	Low chance of occurring due to project design.
Water freezing in the waterline, compromising performance and/or leading to failure	No discharge foreseen during freezing conditions Winterization of the waterline Regular inspection and maintenance.	Reasonable worst case scenario is the waterline is damaged and requires repair and/or portions of it may require removal and replacement. This could result in additional construction effort and additional sensory disturbance to wildlife while this additional work occurs.	This is unlikely to occur due to Agnico Eagle's experience with other lines on the mine site and experience clearing lines.
Cover and slope failure	Sufficient cover depth Use of gravel and sand to construct covers Designed for travel overtop Appropriate sloping 2.5H:1V for stability (e.g., the outside slope of the pipe covering will be same as the road)	Localized cover failure could make it more difficult for wildlife to cross the waterline. There is a potential for a small localized effect to a few individual animals.	This is unlikely to occur due to the planned slopes and planned construction material and regular inspections.
Seepage from the underground portion of the marine discharge pipe	Marine water quality monitoring Ice free discharge only	Localized minor impacts to marine habitat due to the flushing capacity of Melvin Bay and an ice free only discharge.	This may occur during the Project life. Monitoring water quality during the discharge season will occur.

Some additional information of the failure modes are presented here with their mitigation measure:

**Over pressure in the system:** there are two relief valves that protect both pipeline from over pressure, they are to be installed at each end of the line one draining in the pump box, the other draining at the diffuser (see Appendix IR-1 and Appendix IR-3 of this response package).

**Bad operation:** Again, both relief valve will protect the pipeline. The control system also will have integrated security logic that will prevent operating the system outside its designed mode.

**Equipment malfunction:** System is equipped with leak detection that will be triggered by any leak. All three pumps are also equipped with an emergency stop.

**Major pipeline failure:** System is equipped with leak detection that will be triggered by any leak. All three pumps are also equipped with an emergency stop. Once pumps are stopped, leak volume will be limited to the volume contained between up and down hill high point from the failure point.

The pressure class of a polyethylene pipe includes an allowance for surge pressures. The allowance for recurring surge pressures (regular valve and pump operation) is 50% of the pressure class. For occasional surge pressures (unanticipated system failures), the allowance is 100% the pressure class.

<b>Interested Party:</b>	<b>CIRNAC</b>	<b>Rec No.:</b>	<b>CIRNAC-IR-10</b>
<b>Re:</b>	<b>Potential Impacts to Ice-Rich Soils and Permafrost</b>		

**Recommendation Made by Interested Party:**

*CIRNAC requests that AEM assess the potential adverse impacts:*

- a) Of the release or spill of saline water to the terrestrial environment at locations where ice-rich soils are present;*
- b) To permafrost associated with heat transfer from the waterlines.*

**Agnico Eagle's Response to Recommendation:**

**Part A**

Agnico Eagle agrees that this information should be provided and will do so as part of the responses to technical comments.

**Part B**

Please see response to NIRB-IR-016.

<b>Interested Party:</b>	<b>CIRNAC</b>	<b>Rec No.:</b>	<b>CIRNAC-IR-11</b>
<b>Re:</b>	<b>Prevention of Waterline Spills</b>		

**Recommendation Made by Interested Party:**

*CIRNAC requests that AEM provide details regarding the design and function of the fiber optic leak detection system and how emergency response would be actioned. In addition, CIRNAC requests that if available, AEM provide examples of a similar system operating in northern climates.*

**Agnico Eagle's Response to Recommendation:**

The leak detection system uses multimode leak detector to identify the physical characteristics of a leak, such as changes in temperature, pressure, ground strain and acoustics. The fiber-optic cable acts as a fully distributed sensor that offers thousands of detection points along the entire pipeline, capable of pinpointing the location of a leak within 10 m, in real time.

Similar systems are in use in many northern regions, such as Russia and Alberta.

<b>Interested Party:</b>	<b>CIRNAC</b>	<b>Rec No.:</b>	<b>CIRNAC-IR-12</b>
<b>Re:</b>	<b>Conceptual Waterlines Design and Operation</b>		

**Recommendation Made by Interested Party:**

*CIRNAC requests that AEM provide descriptions of the terrestrial portion of the conveyance system, including but not limited to:*

- *Waterlines basic design parameters (e.g., maximum/minimum pressure, volumes, velocities);*
- *Waterlines operational plan (e.g., one line operates at full capacity and the second serves as a backup, or both lines operate in parallel);*
- *Corridor profile / topography;*
- *Ground preparation (e.g., clearing of rock debris, grading to avoid surface water ponding, localized fill);*
- *Waterlines material and general specifications;*
- *Waterlines anchoring (if required);*
- *Pumping requirements and power supply;*
- *Conveyance system monitoring (e.g., pressure, flow, temperature);*
- *Conveyance Section isolation (e.g., automated valve control to limit releases);*
- *Annual winterization (e.g., purging of residual saline effluent); and*
- *Waterlines maintenance requirements (e.g., residual sediments removal, descaling).*

*Given the current stage of the design process, detailed designs are not necessary. Instead, CIRNAC simply requires conceptual descriptions of the waterlines design and how it will be operated to ensure that potential adverse impacts on the environment are avoided, prevented, monitored and adequate mitigation measures are in place.*

*In addition, CIRNAC requests that AEM describe the designs and performance of comparable long-distance saline effluent conveyance systems of similar size that operate in arctic environments. This information is necessary to support AEM's conclusion that the proposed amendment can operate without resulting in potential adverse impacts to the environment.*

**Agnico Eagle's Response to Recommendation:**

**Bullet 1:**

The waterline was designed with those parameters in hand:

1. maximum flow of 20,000 cubic m<sup>3</sup>/day;
2. site elevation 68 meters;
3. highest waterline elevation 98 meters;
4. discharge elevation 0 meters;
5. HDPE maximum allowable pressure 125 psi.

Along the line, vacuum breakers and air vents are installed to protect each pipeline from transitory phenomenon effects.

**Bullet 2:**

Waterline can be run with one or two pumps, and with one or two waterlines. Also, there is a third pump as backup that can be utilized for either of the two waterlines. Operation mode selection will be based on daily flow requirements. System could be operated with one or two pumps flowing in one or both waterlines. Each spring both waterlines will be subject to a full visual inspection. System starting procedure will have to be followed to confirm there are no leaks on start-up.

**Bullet 3:**

See Appendix IR-4 of this response package for detailed plan and profile drawings.

**Bullet 4:**

See drawings in Appendix IR-4 of this response package for site preparation requirements and detailed installation.

**Bullet 5:**

Appendix IR-5 of this response package can be consulted to review HDPE pipe specification.

**Bullet 6:**

Appendix IR-4 and Appendix IR-6 of this response package present where the waterlines will be buried. Anchoring will be required following the pumping station on the mine site to contain any movement that could result from the temperature variation or water flow.

**Bullet 7:**

Each pump is designed to flow 418 cubic meter per hour, doing so will require 200 hp electric motor for each pump. Pumps can be run in parallel, a third pump serve as backup for maintenance or if one of the two other pumps fails.

**Bullet 8:**

The system monitoring includes pumping station flowmeter, tail container flowmeter, pressure monitoring, pumps motors variable frequency drive monitoring and leak detection along both pipes. Signal from all those instruments are managed by PLC that control the system.

**Bullet 9:**

System does not include any automated valve. All valves along both waterlines are manual. If any section of one line needs to be isolated, the system can be run with the other line.

**Bullet 10:**

System will be winterized once pumping season will be over. To do so:

- Pump will be stopped and locked down;
- No flow will be confirmed at the final container;
- Line pigging will be performed to drain both pipes.
- Water in both waterlines will be drained by the pigging process.

- Once dry drained, lines will not be operated until next summer/pumping season and remain dry for the whole winter.

**Bullet 11:**

The whole waterline system including pumps and pumps box will be maintained following its components maintenance recommendations. Although sediment accumulation isn't suspected, pigging the waterline every fall to drain it before winter will remove accumulated sediment.



<b>Interested Party:</b>	<b>CIRNAC</b>	<b>Rec No.:</b>	<b>CIRNAC-IR-13</b>
<b>Re:</b>	<b>Burying/Covering the Waterlines Along the All-weather Access Road</b>		

**Recommendation Made by Interested Party:**

*CIRNAC requests that AEM:*

- a) Confirm it intends to cover/bury 80% to 90% of the waterlines length and provide information on which portions of the route the pipelines will not be covered/buried;*
- b) Describe why the concept was changed;*
- c) Describe the revised concept (e.g., will the waterlines be covered by extending the side slopes of the road?);*
- d) Indicate how the change affects the effects assessment presented in the FEIS Addendum;*
- e) Provide information on the incremental borrow requirements associated with covering the waterlines and whether borrow sources will need to be expanded to meet the requirements;*
- f) Confirm whether the change will require other modifications to the waterlines concept (other than the elimination of the previously identified caribou crossings); and*
- g) Indicate how the fiber-optic leak detection system will function on the buried waterlines.*

**Agnico Eagle's Response to Recommendation:**

**Part A**

At this time 80-90% of the waterline will be covered. The decision basis for determining the locations is based on the following considerations:

1. The topography and underlying material in the location along the AWAR and bypass road.
2. Water crossings
3. Feedback from the communities and the HTO in regard to key areas for caribou crossing
4. Access for waterline maintenance

The figure provided in Appendix IR-6 of this response package provides the areas of the portion of lines that will not be covered/buried.

**Part B**

This concept was changed based on feedback from communities on concerns related to the waterlines and caribou movement, as well as whether the crossing structures would be sufficient. Agnico Eagle committed to covering the waterlines as much as feasible from an engineering and design perspective. This commitment was made public on our Facebook page August 19, 2020 and included in our August 28, 2020 Waterline Consultation Report (NIRB Public Registry ID 331287).

**Part C**

Appendix IR-7 provides a detailed section drawing showing how the waterline will be installed alongside the AWAR.

**Part D**

Appendix IR-8 of this response package provides an assessment of the impacts of covering the waterlines. However, in summary the key impacts from covering the waterlines are related to air quality from the construction of the covers and the potential for dust emissions during cover construction and operation. Impacts to caribou, related to barriers to movement are anticipated to be positive and given that all materials required to cover the waterlines will be from existing and approved quarries and burrows, there is no change anticipated to the total footprint of the Meliadine Mine, beyond that which was assessed in previous FEIS.

**Part E**

It is estimated that 60,000 m<sup>3</sup> of burrowed material will be required to cover the lines. That quantity will be drawn from within existing eskers. No new sources of burrows will be required.

**Part F**

Covering of the lines may change the specifics of construction around the AWAR where there are hydrological connections that need to remain intact to avoid impacts to hydrology and fish and fish habitat.

**Part G**

Please refer to CIRNAC-IR-11.

<b>Interested Party:</b>	<b>CIRNAC</b>	<b>Rec No.:</b>	<b>CIRNAC-IR-14</b>
<b>Re:</b>	<b>Employment and Procurement – Cessation of Groundwater Trucking Operations</b>		

**Recommendation Made by Interested Party:**

*CIRNAC recommends that AEM provide information on their plan of dealing with the impacted people, particularly Inuit beneficiaries because of cessation of trucking operations for the conveyance of treated saline effluent from the mine site to the Melvin Bay.*

**Agnico Eagle’s Response to Recommendation:**

In the 2018 FEIS Addendum Treated Groundwater Effluent Discharge, it was acknowledged that two to four drivers would be required for the summer season to haul water. To haul water in 2020, Agnico Eagle hired 40 contractors from an NTI firm within the community. Due to the nature of the tasks for hauling water that requires contact with the mine site infrastructure and workers, preventing the COVID “No Contact” protocol to be enforced, south based contractors were hired to haul water during the summer to comply with our protocol. Agnico Eagle anticipates in the short-term that Inuit beneficiaries will be hired to support in the construction of the waterlines.

The total workforce required for the waterline would be approximately 35 direct/indirect workers during construction. The target for Inuit employment is 10 to 14 of those workers.

<b>Interested Party:</b>	<b>CIRNAC</b>	<b>Rec No.:</b>	<b>CIRNAC-IR-15</b>
<b>Re:</b>	<b>IQ and Traditional Land and Resource Use – Wildlife Monitoring Program</b>		

**Recommendation Made by Interested Party:**

*CIRNAC recommends that AEM provide a summary of the KHTO's involvement in a wildlife-monitoring program specific to the all-weather access road and any other project components (e.g., marine discharge). The summary should include an overview of existing monitoring results, their relevance to project monitoring plans, and adaptive management considerations.*

**Agnico Eagle's Response to Recommendation:**

KHTO has been involved in regular AWAR wildlife observations and were involved in the caribou migration at the Meliadine Mine. Results of the KHTO wildlife observations will be compiled and included in the 2020 Annual Report. As a result of the social distancing practices relating to COVID-19, the KHTO have not been able to participate directly with Agnico Eagle employees and consultants in relation to field programs during the 2020 season but did participate in some of the programs in 2019. The KHTO have provided information on ice-free and ice on conditions at Melvin Bay in relation to TC 131. The results of the KHTO observations will be compiled and included in the 2020 annual report.

Agnico Eagle, by way of a 2019 Contribution Agreement, agreed to fund KHTO to develop the capacity and carry out various wildlife research and monitoring. Specifically, KHTO was to participate in monitoring impacts and behavioural observations of caribou at the Meliadine Mine and on the AWAR and collect Inuit Qaujimajatuqangit. Regrettably, KHTO then wildlife monitor was unable / unwilling to provide KHTO board approved monitoring reports for the year 2019. The wildlife monitor did attend some monitoring programs in 2019 but they were minimal and was a part of some of the sampling on Melvin Bay but for the most part no AWAR surveys were done in 2019 by the KHTO. They were however part of the caribou migration for 2019.

## **ENVIRONMENT AND CLIMATE CHANGE CANADA (ECCC)**

<b>Interested Party:</b>	<b>ECCC</b>	<b>Rec No.:</b>	<b>ECCC-IR-1</b>
<b>Re:</b>	<b>Air Quality Management Plan</b>		

**Recommendation Made by Interested Party:**

*ECCC requests that the Proponent provide details on how they intend to monitor dust emissions, respond to community concerns (particularly for construction activities occurring close to the communities), and mitigate dust during construction of the waterline described in the IS Addendum.*

**Agnico Eagle's Response to Recommendation:**

Modelling to predict the maximum monthly and annual dust deposition or dustfall (as total suspended particles), resulting from the construction of the bypass road and operation of the Itivia quarry around the community of Rankin Inlet showed that the predicted maximum monthly and annual dust deposition were well below the respective dustfall criteria during construction (Golder 2017). In previous assessments Agnico Eagle assessed air emissions relative to where the greatest impacts would be measured. As the Waterline Project remains smaller in scale than what was assessed in the FEIS (Agnico Eagle 2014), and consistent with much of the activities assessed in the 2018 FEIS Addendum (Agnico Eagle 2018), many of the predicted effects will remain unchanged.

Furthermore, a quantitative generalized assessment of emissions from pipelines was calculated based on guidance in the Western Regional Air Partnership fugitive dust handbook and EPA construction emissions data to provide an estimate of emissions from the waterline. The emissions estimations are likely conservative for the following assumptions:

- Construction per the approximately 3-month period and assumed emissions over all kilometres of the route to a by-km result.
- Construction emissions for this pipeline assume worst-case emission factors, in comparing to road construction as a similar process.
- Tundra surface material is likely wetter than the standard construction surfaces the emission factors are calculated from and permafrost is near surface, so natural mitigations will likely reduce emissions that cannot be accounted for here.

In terms of tonnes of dust per km per day of surface pipeline construction, total fugitive dust emissions are low, as presented in Table ECCC-IR-1.

**Table ECCC-ER-1: Total Fugitive Dust Emissions**

<b>Emissions Estimation</b>	<b>Tonnes per km per day</b>
TSP	0.0135
PM10	0.0047
PM2.5	0.0005

Nevertheless, Agnico Eagle will continue to use best management practices to control and suppress dust emissions during the construction phase of the waterline. Dust suppression practices to be implemented during the construction and operations phase include:

- Roads will be regularly graded to mix excessive silt found on the road surface with the coarser materials located deeper in the roadbed during construction and operation of the waterline. This will reduce the percentage of silt in the road surface with the benefit of reducing related dust;
- Regularly inspect the road and undertake timely repairs to minimize the silt loading on the road surface during construction and operation of the waterline;
- Where possible, avoid multiple handling of materials that have the potential to generate dust;
- Employees and contractors will be encouraged to report excessive dust to their supervisor.
- Maintain the short construction period for waterline cover construction
- Minimize dust-generating activities, as practicable, during periods of high wind
- Speed limits for vehicles will be enforced to assist in reducing dust emissions
- Regular maintenance of vehicles, equipment, and road surfaces, per current practice
- Adherence to relevant existing management plans (e.g., Roads Management Plan and Dust Management Plan)
- Use of dust suppression methods as outlined in the Nunavut Environmental Protection Act.
- Use of gravel in the waterline covers to minimize dust during construction.
- Application of water to roadways during periods where water application would not result in any safety hazards during waterline construction.
- All mobile vehicles and mine equipment will meet the applicable emission standards at time of purchase. Newer equipment was assumed to comply with Tier 3 emission standards.

Agnico Eagle will present more details of the dust construction best practices in the 30-day notice that will be issued to regulators prior to the beginning of the work.

**References:**

Agnico Eagle. 2014. Final Environmental Impact Statement (FEIS) - Meliadine Gold Project, Nunavut from: [ftp://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/11MN034-Agnico Eagle%20MELIADINE/2-REVIEW/09-FINAL%20EIS/FEIS](ftp://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/11MN034-Agnico%20Eagle%20MELIADINE/2-REVIEW/09-FINAL%20EIS/FEIS).

Agnico Eagle. 2018. Meliadine Gold Mine – Final Environmental Impact Statement Addendum, Environmental Assessment of Treated Groundwater Effluent Discharge into Marine Environment, Rankin Inlet. June 2018.

Golder (Golder Associates Ltd.). 2017. Meliadine Gold Mine Dust Deposition Modelling for Construction of By-Pass Road. Submitted to Agnico Eagle Mines Limited. Doc 615-1663489. March 2017.

## **FISHERIES AND OCEANS CANADA (DFO)**



<b>Interested Party:</b>	<b>DFO</b>	<b>Rec No.:</b>	<b>DFO-IR-1</b>
<b>Re:</b>	<b>Waterline Pipe Installation</b>		

**Recommendation Made by Interested Party:**

*DFO requests that AEM:*

*1.1 DFO recommends the Proponent provide:*

- Clarification on method of installation for proposed pipelines from the Meliadine mine site to the Itivia facility along the all-weather access road and by-pass road.*
- Calculation and description of habitat area impacted below high water mark, if any.*

*1.2 Engage with DFO to ensure that all fish frequented watercourses adequately enable fish passage if pipeline crossing designs will impact area below the high water mark.*

**Agnico Eagle's Response to Recommendation:**

**Part 1.1**

**Bullet Point 1:** Refer to construction drawing package (Appendix IR-4 of this response package).

**Bullet Point 2:** Where the waterline crosses major water crossings that are supported by bridges along the AWAR (i.e., Meliadine River, Char River and Mile 5 crossings), the waterline will run directly under, and secured to the bridges, avoiding any potential disturbance to habitat below the high watermark.

For crossings over streams with minimal potential to support fish, such as those where flows are not visible and where there are no defined bed and banks, the waterline will be carefully positioned to allow for unobstructed flows during spring freshet conditions, maintaining bank integrity and vegetation. Heavy machinery will not be used within the high watermark during installation. Agnico Eagle is also committed to minimizing the size of the footprint to the extent possible, and to ensure proper sediment control, as per DFO measures to protect fish and fish habitat.

The potential risks to fish and fish habitat from the construction and operation of the waterline are expected to be very low, for example, the calculated disturbance footprint below the high watermark on watercourses with the potential to support fish is expected to be negligible in magnitude. As the design is advanced, Agnico Eagle will work with DFO for required approvals under the protections of the *Fisheries Act*, if required

The current construction method proposed for the marine environment is horizontal directional drilling, which would be above the high watermark. As investigations continue into the detailed methods, if the method requires a change, DFO will be notified.

**Part 1.2**

In the event the detailed design changes, such that areas below the high watermark are affected, Agnico Eagle will engage with DFO to confirm that measures are being implemented to maintain fish passage, disturbance footprints are negligible, and that any affected bank or riparian vegetation will be remediated to the extent possible following waterline installation.

<b>Interested Party:</b>	<b>DFO</b>	<b>Rec No.:</b>	<b>DFO-IR-2</b>
<b>Re:</b>	<b>Construction/Installation of discharge pipe and diffuser</b>		

**Recommendation Made by Interested Party:**

*DFO requests that AEM:*

*2.1 Provide clarification on the following proposed items:*

- *Footprint associated with the installation of the pipeline below the high- water mark*
- *Detailed design drawings of pipeline and diffuser*
- *Calculation and description of habitat area impacted below the high water mark*

*2.2 Engage with DFO as required for the proposed pipeline and diffuser installation. Please refer to our Project Near Water website for more information. <https://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>*

**Agnico Eagle's Response to Recommendation:**
**Part 2.1**

**Bullet Pont 1:** Appendix IR-6 of this response package provides the footprint of the waterline. The construction footprint will be provided with the future submission of a Request for Review application, if required. The calculated disturbance footprint below the high watermark on watercourses with the potential to support fish is expected to be negligible in magnitude.

**Bullet Point 2:** Detailed design drawings of the pipeline and diffuser will be developed if the amendment is approved. However please see the construction design package (Appendix IR-4 of this response package).

**Bullet Point 3:** Construction activities and the placement of the waterline are intended to occur above the high watermarks at crossings where streams are fish-bearing or potentially fish-bearing (i.e., where flows are present), and therefore, habitats adjacent to fish-bearing watercourse will not be impacted. For crossings over streams where flows are not visible and where there are no defined bed and banks for the stream (i.e., streams that are not fish-bearing), the waterline will be carefully positioned to allow for unobstructed flows during spring freshet conditions, maintaining bank stability and vegetation. Heavy machinery will not be used within the high watermark during installation. Agnico Eagle is also committed to maintaining a negligible habitat footprint to the extent possible, and to ensure proper sediment control, as per DFO measures to protect fish and fish habitat.

The potential risks to fish and fish habitat from the construction and operation of the waterline are expected to be very low, for example, the calculated disturbance footprint is expected to be negligible in magnitude. As the design is advanced, Agnico Eagle will work with DFO for required approvals under the protections of the Fisheries Act, if required

**Part 2.2**

Agnico Eagle will engage with DFO as required for the proposed waterline and diffuser installation through the DFO Request for Review process. Currently, Agnico Eagle's intends to avoid works below the high watermark on streams that are fish-bearing or potentially fish bearing where flows are present. Agnico

Eagle is committed to follow the fish and fish habitat protection provisions of the *Fisheries Act* by incorporating recommended measures to avoid causing death of fish and the harmful alteration, disruption or destruction (HADD) of fish habitat. Where Agnico Eagle cannot completely implement all measures to protect fish and fish habitat, applicable standards and codes of practice will be applied during construction of the waterline and diffuser. The potential risks to fish and fish habitat from the construction and operation of the waterline are expected to be very low, for example, the calculated disturbance footprint below the high watermark on watercourses with the potential to support fish is expected to be negligible in magnitude.

**GOVERNMENT OF NUNAVUT (GN)**

<b>Interested Party:</b>	<b>GN</b>	<b>Rec No.:</b>	<b>GN-IR-01</b>
<b>Re:</b>	<b>Pipeline Alternatives</b>		

**Recommendation Made by Interested Party:**

*With respect to the disposition of this issue, the GN requests the Proponent provide the following information:*

- 1. What would the diameter of each pipeline be if 3 and 4 were used instead of the 2 proposed?; and*
- 2. What is the feasibility of using more than 2 pipelines from cost and logistical/engineering perspectives? Would the use of more than 2 pipelines make it easier to burying the pipelines?*

**Agnico Eagle's Response to Recommendation:**

**Part 1**

Agnico Eagle is not considering the use of more than two pipelines as there would be no benefits both for the covering as well as operationally wise. A smaller diameter would adversely impact the capacity to convey water as the resistance between the pipes and the water increase as the diameter decreases.

**Part 2**

It is possible from an engineering perspective to have more than two pipelines; however, it wouldn't make it easier to bury the pipes. The surface of the pipe to cover is determined by factors such as terrain and water crossings.

<b>Interested Party:</b>	<b>GN</b>	<b>Rec No.:</b>	<b>GN-IR-02</b>
<b>Re:</b>	<b>Pipeline Design</b>		

**Recommendation Made by Interested Party:**

*With respect to the disposition of this issue, the GN requests the Proponent provide the following information:*

- 1. Clarification regarding the color of the pipes used to construct the pipelines;*
- 2. Clarification regarding which side of the road the pipelines will be placed; and*
- 3. Further information regarding all markings, flagging and signs that will be used to identify the location of the pipelines including the number, type and spacing of all markings, flagging and signs to be used.*

**Agnico Eagle's Response to Recommendation:**

**Part 1**

The waterline will be constructed of HDPE and the colour is black.

**Part 2**

The majority of the waterline will be on the east side of the AWAR; please refer to construction drawings in Appendix IR-4 of this response package.

**Part 3**

Regarding the identification of the waterlines, warning signs will be installed every 200 meters for a total of 175 signs.

<b>Interested Party:</b>	<b>GN</b>	<b>Rec No.:</b>	<b>GN-IR-03</b>
<b>Re:</b>	<b>Caribou Crossings</b>		

**Recommendation Made by Interested Party:**

*With respect to the disposition of this issue, the GN requests the Proponent provide the following information:*

1. *Does the Proponent's new commitment to bury 80 to 90 percent of the waterline replace its prior commitment to construct up to 70 crossings to enable caribou crossings?*
2. *Does the Proponent guarantee that the as-built pipeline will include 70 crossings for caribou or is the decision to build some or all crossings pending a future decision by the Proponent based on a determination of whether some or all of the 70 are required;*
3. *If the decision to build additional crossings is to be made on an "if required" basis, as indicated section 8.1.2 of the Addendum, please clarify the scope of "if required". For example:*
  - *Who will make this determination/decision?*
  - *What information, criteria, and/or thresholds will it be based on?*
  - *How will this information be collected? By whom?*
  - *When will this decision be made relative to the NIRB's review of the Project?*
4. *Specify the size of these crossings (i.e. the length of pipeline buried at each crossing and the width of the ramped, gentler slopes);*
5. *Provide references to published studies that support the efficacy of these crossings in facilitating the movements of barren-ground caribou, based on the design specifications as proposed in the Addendum; and*
6. *What monitoring will be conducted to validate crossing locations and/or the permeability of the proposed buried waterline corridor. The GN recommends the Proponent provide a technical memo on:*
  - *Study design and schedule*
  - *Details of sampling effort*
  - *Descriptions of how the study design could validate crossing locations and/or the proposed waterline's general permeability (as indicated in Section 8.1.2 of the Addendum).*

**Agnico Eagle's Response to Recommendation:**

**Part 1**

As described in the response to KivIA-IR-08, Agnico Eagle has committed to covering 80-90% of the waterline. With this cover in place, caribou are expected to cross the road-waterline structure in the same way they currently cross the road. Agnico Eagle has committed to covering up to 90% of the waterline with fine-grained materials from existing esker quarries based on community feedback during consultation. The line cannot be completely covered due to water crossings and topographical constraints.

**Part 2**

Given the waterlines will now be covered, the need for constructed caribou/ATV crossings is no longer necessary however will be further evaluated if required especially around Apache Pass.

**Part 3**

See responses above.

**Part 4**

See responses above.

**Part 5**

See responses above.

**Part 6**

Monitoring of crossing use by caribou is not relevant given the waterlines will now be covered. However, the existing TEMMP includes monitoring activities that can describe caribou interactions with the waterlines and the AWAR from collar data, AWAR Road Surveillance and Surveys, and Behaviour monitoring. In addition, Agnico Eagle has committed to additional monitoring to inform adaptive management of the waterlines including site visits by Inuit Elders, tracking caribou road crossings using GPS collars, a remote camera study and continued road surveys with the HTO.

These monitoring programs examine a) when and where caribou interact with the road, b) the rate of deflections (caribou turning away from the road) and c) caribou behaviour near the road and in response to stimuli. These monitoring programs are sufficient to examine potential effects of the road and waterline on caribou within the existing monitoring programs described in the TEMMP.



<b>Interested Party:</b>	<b>GN</b>	<b>Rec No.:</b>	<b>GN-IR-04</b>
<b>Re:</b>	<b>Caribou Response</b>		

**Recommendation Made by Interested Party:**

*With respect to the disposition of this issue, the GN requests the Proponent provide the following information:*

1. *Present the July 2020 behaviour monitoring data, and an analysis of these data, that were used to substantiate the statement that caribou may be delayed in their movements when the waterlines are constructed;*
2. *Please present the source documents for the statement regarding “experience in Alberta” that was used to substantiate the statement that caribou may be delayed in their movements when the waterlines are constructed;*
3. *Please provide a review of, and references for, the source documents that were used to support the statement that crossing structures over similar structures are used by caribou in other jurisdictions:*
  - *Please identify which of these source documents involves studies of barren-ground caribou crossing pipelines on the ground; and*
  - *Please explain in technical detail how these studies detected/measured the effect of crossing structures in increasing the permeability of pipelines to caribou.*
4. *Provide a copy of the report ERM (2020), as cited in the Addendum;*
5. *Provide a copy of the Appendix H, as cited in the FEIS Addendum (as a literature review of caribou and linear development); and*
6. *Please clarify the basis of the statement local effects are predicted in caribou that may not translate to measurable demographic changes to caribou populations:*
  - *Which studies of barren-ground caribou is this based on?*
  - *Please provide citations for these studies.*
  - *If this conclusion is based on professional opinion rather than specific studies of barren-ground caribou, please clarify and qualify this professional opinion.*
  - *Has Inuit Qaujimajatuqangit (IQ) on this topic been collected? If so, please provide citations for relevant documentation of this IQ. What does this IQ suggest about possible demographic changes?*

**Agnico Eagle’s Response to Recommendation:**

**Part 1**

During 2020, Agnico Eagle updated the methods used for behaviour monitoring to follow the scan sampling guidelines produced by the Government of Northwest Territories, Department of Environment and Natural Resources (GNWT ENR). Behaviour monitoring occurred along Project roads and at the mine site. The results of this monitoring is scheduled to be included in the Meliadine 2020 TEMMP Report to the NIRB in March 2021.

**Part 2**

Agnico Eagle has provided the literature review Appendix IR-11 of this response package.

In addition, construction activity is often assessed in environmental assessments as a source of sensory disturbance (i.e., avoidance due to noise, smell and human presence, among others). It follows a general logic that construction activities for the waterlines would cause noise and human presence and may cause caribou to pause as they are moving through the area, should construction occur at the same time that caribou are on site. However, Agnico Eagle has committed to placement and covering of the waterlines outside of the period when caribou are most likely to be on site in large numbers (i.e., late June to mid-July). Nonetheless, Jalkotzy et al. (1997) compiled one of the earliest summaries of linear disturbance effects such as roads and pipelines, on wildlife and described some studies that examined construction activities on wildlife. During construction, buried pipelines have been shown to have an effect on ungulate movements. Elk, moose and deer all elicited a negative response to pipelines during construction (Klein 1979; Van Ballenberghe 1978; Morgantini 1982, 1984). Crossing frequency was related to species size, size and number of pipes, berms and trenches involved in the construction (Morgantini 1982, 1984). Crossing frequency declined as the number of pipes increased and as visibility across the rights-of-way decreased (i.e., the right-of-way width became wider), however, this work was within a forested environment and the same observations may not hold true for barren ground caribou that live in an open environment and within large herds. In addition, construction is planned in the fall, outside the window in which caribou are present in the area.

**Part 3**

Agnico Eagle has provided the literature review in Appendix IR-11 of this response package.

In summary, Agnico Eagle understands that barren ground caribou currently cross the AWAR, which is a low-profile road with fine-grained materials. Based on our understanding of some of the mitigation presented, we feel we can mitigate any additional effects of the covered waterlines.

**Part 4 and 5**

Agnico Eagle has provided the literature review in Appendix IR-11 of this response package

**Part 6**

The problem of scale in ecology has a long history where patterns observed are not similar between spatial or temporal scales (Wiens 1989; Levin 1992; Schneider 2001). Environmental assessment considers whether incremental (local) or cumulative (regional) impacts and are intermittent or more common (temporal scales) and influence species at the population level. Several recent studies on barren-ground caribou have demonstrated that environmental effects measured at the local scale did not result in measurable changes at the population levels (Gurarie et al. 2019; Mallory et al 2020; Golder 2020). Thus, barren-ground caribou have exhibited plasticity, which allows them to be resilient to local scale effects.

As described in the response to KivIA-IR-08, Agnico Eagle has committed to covering 80-90% of the waterline. With this cover in place, caribou are expected to cross the road-waterline structure in the same

way they currently cross the road and the TEMMP studies will be completed to monitor caribou interactions and apply adaptive management, if necessary.

Regarding *Inuit Qaujimajatuqangit* (IQ) and as part of early consultation (Nanuk 1999) for this Project elders and community members were asked for their views and concerns about exploration and mining, in particular as Rankin Inlet is one of the few communities that had exposure to mining activity prior to recent mines (e.g., Meliadine). There were a few comments and observations provided based on the anticipated mining effects to caribou from the mine, however, most were in relation to the mine serving as a protected area or area where caribou would hang around as long as they were not being hunted, which may have a demographic consequence, although not explicitly stated (Nanuk 1999). In addition, natural features such as overlap with muskox and anthropogenic features such as the creation of Rankin Inlet itself were also raised as a mechanism affecting caribou distribution (Nanuk 1999). However, community members did express concerns that helicopters would scare caribou off (Nanuk 1999).

**Literature Cited:**

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- Nanuk (Nanuk Enterprises Ltd.). 1999. WMC International Ltd. Meliadine West Gold Project: Traditional Ecological Knowledge Study. Final Report. Rankin Inlet, July 1999.
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<b>Interested Party:</b>	<b>GN</b>	<b>Rec No.:</b>	<b>GN-IR-05</b>
<b>Re:</b>	<b>Baseline Conditions</b>		

**Recommendation Made by Interested Party:**

*With respect to the disposition of this issue, the GN requests the Proponent provide the following information:*

1. *A table of monthly, recorded traffic levels on the AWAR (including public traffic) presented by year since project operations at the Meliadine mine began:*
  - *This table should identify what portion of the recorded traffic was for the purposes of saline water discharge; and*
  - *For comparison, the table should also identify traffic levels as predicted and presented in the 2014 FEIS;*
2. *A table of projected future traffic levels (including public traffic) for the AWAR if the Project amendment is approved:*
  - *This should be based on recorded traffic levels during operation of the mine and the assumption that truck-based transportation of saline water discharge along the AWAR will cease; and*
  - *This table should be presented as a reference document that reviewers can use in the assessment and monitoring of the Project if the proposed amendment is approved;*
3. *An analysis of collar data, and other data if available, to estimate the effects of the approved Project on the movements of caribou (e.g. delays in crossing the AWAR and/or deflections from the Project). This should include an evaluation of deflections of migrating caribou relative to the 10% threshold in the TEMMP;*
4. *Clarify where and how in the FEIS Addendum changes in baseline conditions for caribou, traffic levels and estimated effects, that have taken place since the 2014 FEIS was submitted, have been reported and integrated into the assessment; and*
5. *Provide a quantitative assessment of the effects of the Project amendment on caribou movements that incorporates changes in caribou baseline since the 2014 FEIS, revised predictions for traffic levels (taking into account levels already observed), and observed effects of the approved Project on caribou, if any.*

**Agnico Eagle's Response to Recommendation:**

**Part 1**

As presented in the 2019 annual report, the monthly traffic level from Rankin Inlet to Meliadine and from Meliadine to Rankin are provided below. Regarding predicted traffic levels, see the response to NIRB-IR-012.

Month	Departures From MEL	Arrivals To MEL
January	538	538
February	513	515
March	602	600
April	663	670
May	670	663
June	771	759
July	1093	1084
August	1516	1498
September	1493	1487
October	1245	1278
November	715	697
December	589	580
<b>Sum</b>	<b>10408</b>	<b>10369</b>
<b>Total</b>	<b>20777</b>	

Contained within this 2019 traffic data are 810 round trips between August 1 to October 11 for brine discharge.

## **Part 2**

Public traffic (ATV) is not recorded as part of this dataset. The above levels of traffic, represented monthly, would reflect future levels of traffic with the subtraction of brine discharge. See NIRB-IR-012 for additional information on traffic.

## **Part 3**

As described in the response to KivIA-IR-08, Agnico Eagle has committed to covering 80-90% of the waterline. With this cover in place, caribou are expected to cross the road-waterline structure in the same way they currently cross the road. Caribou will not have to cross an un-covered waterline or use crossing structures.

Given the waterlines will now be covered, and will essentially be seamless with the road but with a lower profile, Agnico Eagle does not believe there would be any additional effect to caribou outside of the existing AWAR, which is monitored within the TEMMP.

Existing caribou crossing information and walkline densities is presented in Figure KivIA-IR-9a. Areas with the highest frequencies of caribou collar crossing will have the waterlines covered (Figure KivIA-IR-9b).

As described in the response to KivIA-IR-08, the TEMMP (2020) includes an evaluation of deflections and an analysis of caribou crossing data, which is completed as part of the TEMMP reporting.

**Part 4**

As per a response to a similar request from the GN on the 2019 Annual Report, we have provided the following. Traditional Knowledge and Inuit Qaujimagatuqangit information collected as part of the FEIS for the Mine identified that Elders in the region indicated that caribou migrate through the Project development area approximately every 6 to 12 years (FEIS Volume 9, Section 9.3, Agnico Eagle 2014). This cyclical migratory information was incorporated as part of the impact assessment, which assessed disruption or alteration of migration routes from the presence of the Mine or Project-related activities (FEIS Volume 6, Section 6.6, Agnico Eagle 2014). Caribou (in large numbers) interact with the Project up to of 11 days as part of post-calving movements, or 3% of the year with a few other individual observations throughout the year. Changes to caribou demography, if they were to occur as a result of the Project, would likely not be measurable at the level of the herd given this short duration. The numbers, as reflected in the collar data, are highly variable. For example, in 2019, 90% of the collared animals interacted with the Regional Study Area (RSA); however, 28% interacted with the AWAR, 1% interacted with the lease area, and 5% interacted with Rankin Inlet. Although there is an increase in the number of collared animals overlapping with the RSA, this does not necessarily translate to an increasing amount of time spent within the RSA by collared animals.

Trends observed to date are within FEIS predictions, and the TEMMP was designed to mitigate Project-related impacts and is already a conservative management plan for caribou. For example, mitigation measures include closure of the mine site when a group of 50 caribou are within 5 km of the site, and closure of the road when a group of 50 caribou are observed along the road. Given that caribou may occur in the area during the post-calving period, they typically occur in very large aggregations, numbering in the thousands. This means that there are really only two states for the Project: 1) there are thousands of caribou on site and both Mine and roads are closed, or 2) there are no caribou on site and both Mine and roads are open. The current management measures in the TEMMP are appropriate to address this binary condition for caribou.

At this point, and for the above-mentioned reasons, Agnico Eagle does not believe the TEMMP's caribou monitoring and mitigation provisions require an update.

**Part 5**

Agnico Eagle does not believe it is necessary to conduct additional assessments of effects of traffic on caribou. The potential effects of traffic have already been assessed in the Meliadine FEIS (Agnico Eagle 2014) and the 2018 FEIS Addendum (Agnico Eagle 2018). The potential for the waterline to obstruct caribou movement has been mitigated following consultation; Agnico Eagle has committed to covering 80-90% of the waterline following suggestions from the community. In addition, the installation of the waterline will remove the need for water truck traffic. Therefore, it is not anticipated that the addition of the waterline will cause any effect on caribou movement.

The TEMMP (2020) includes monitoring for caribou movement, through collar monitoring and ground-based behaviour monitoring. The results of this monitoring is reported in the annual TEMMP report.

The Meliadine FEIS (Agnico Eagle 2014) included IQ data that caribou have historically periodically shifted their distribution to cover the Project area, and potential effects of the Project were evaluated in consideration of that information.

The Meliadine FEIS Addendum (Agnico Eagle 2018) evaluated the potential effects of increased traffic due to trucking saline water from Meliadine to the ocean discharge.

The current Addendum application (Agnico Eagle 2020) is applying to install a waterline from Meliadine Mine to the ocean. This Addendum evaluated the potential effects of the waterline on caribou movement. As described in the response to KivIA-IR-08, Agnico Eagle conducted consultation on the waterline and in response to concerns about caribou crossing the waterline, Agnico Eagle has committed to covering 80-90% of the waterline (Commitment #9; NIRB Public Registry ID 331287). With the waterline buried in the side of the road, caribou are expected to cross in the same way they currently cross the road. Caribou will not have to cross an un-covered waterline or use crossing structures.

In addition, the waterline will decrease the traffic level at site.

From a caribou perspective, the road will remain unchanged, though somewhat wider where the waterline is buried in the side of the road, and with somewhat reduced traffic. If no effect is predicted, then there is no way to provide a quantitative assessment of change in road crossing behaviour.

The TEMMP (2020) includes monitoring for caribou movement and road crossing/deflections. Examining the collar data for the project RSA indicates that the fix frequency during July when caribou are in the RSA is long. There are multiple kilometres between fixes for the same animal. These data do not provide the fine-scale movement data required for a detailed road-crossing analysis that the GN is envisioning.

Agnico Eagle is currently in negotiations for an Agreement with the GN to support collaring of the Qamanirjuaq herd. Agnico Eagle will continue to support collaring research and is interested in discussing future data quality for this herd, including the use of gated collars such that more detailed information on caribou movement can be gathered.

#### **References:**

- Agnico Eagle. 2014. Final Environmental Impact Statement (FEIS) - Meliadine Gold Project, Nunavut from: [ftp://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/11MN034-Agnico Eagle%20MELIADINE/2-REVIEW/09-FINAL%20EIS/FEIS](ftp://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/11MN034-Agnico%20Eagle%20MELIADINE/2-REVIEW/09-FINAL%20EIS/FEIS).
- Agnico Eagle. 2018. Meliadine Gold Mine – Final Environmental Impact Statement Addendum, Environmental Assessment of Treated Groundwater Effluent Discharge into Marine Environment, Rankin Inlet. June 2018.



<b>Interested Party:</b>	<b>GN</b>	<b>Rec No.:</b>	<b>GN-IR-06</b>
<b>Re:</b>	<b>Monitoring Caribou Response</b>		

**Recommendation Made by Interested Party:**

*With respect to the disposition of this issue, the GN requests the Proponent provide the following information:*

1. *Given, the logistical and safety limitations previously noted by AEM, please explain how a higher frequency of AWAR wildlife surveys will be implemented during the period when caribou are directly interacting with the AWAR and proposed water pipelines;*
2. *Clarify what the frequency of AWAR wildlife surveys will be when caribou are directly interacting with the AWAR and proposed water pipelines;*
3. *Provide a technical memo explaining how AWAR road surveys will be used to monitor AWAR and pipeline effects on caribou:*
  - *This should specify the data being collected, program sampling design, sampling effort (based on a power analysis), spatial extent of sampling, sampling schedule and analytical approach to be employed; and*
  - *This should also include a schedule for data analyses and presentation of results that demonstrates how this monitoring program will provide the necessary quality and quantity of data to facilitate adaptive management in a timely manner; and*
4. *Provide a technical memo explaining how the caribou collaring program will be used to monitor AWAR and pipeline effects on caribou:*
  - *This should specify the data being collected, program sampling design, the number of collars needed by AEM on Qammanirjuaq caribou to detect adverse effects of the Project (based on a power analysis), and a sampling schedule;*
  - *This should also include a schedule for data analyses and presentation of results that demonstrates how this monitoring program will provide the necessary quality and quantity of data to facilitate adaptive management in the timely manner; and*
  - *Please note, the GN acknowledges that caribou collaring is a GN-led activity in the Kivalliq region, however the GN is seeking specific information on the study design needs and level of collaring effort that the Proponent will need in-order to monitor the effects of the proposed, amended Meliadine Project on caribou. This information is needed in-order for the GN and other intervenors to assess the likelihood that the collaring program will provide a reliable means of Project monitoring.*

**Agnico Eagle's Response to Recommendation:**

**Part 1**

The TEMMP Plan includes AWAR road surveillance of wildlife; recording incidental observations. The TEMMP Plan also includes AWAR road surveys, which are scheduled for once per week during the year. Operationally, during the approximately month-long period when caribou are approaching or near site, driving and height of land surveys are conducted three times per day (6 am, noon and 6 pm).

Some of these surveys are curtailed for logistic or safety reasons when large groups of caribou are on the road, which could trap surveyors in the field or expose them to danger as harvesters use the road to harvest caribou very near the road.

These surveys curtailed for safety largely affect the ability to collect information on harvester use of the road, as was planned in the 2014 TEMP. However, Agnico Eagle has committed to a Hunter Harvest Study to examine the location, number and season of harvesting for caribou by residents of Rankin Inlet.

Currently the caribou monitoring programs outlined in our response to GN-IR-03 Part 4 discusses caribou monitoring. Agnico Eagle does not anticipate the need for any additional caribou monitoring in response to the addition of the covered waterlines when caribou are on site.

## **Part 2**

Surveys would be conducted daily as they are currently, and often multiple times per day, to primarily understand the distribution, herd size and direction of travel while caribou are on site. Secondly, if observation opportunities are available, and safe, behavioural scans are also completed. However, during the caribou alert status, access to vehicles and the road is often limited to mitigate any disturbance to caribou during the brief period they interact with the site.

## **Part 3**

The current TEMMP programs designed to monitor caribou interacting with the road, will still hold the same value when the covered waterlines are approved and built.

## **Part 4**

The topic of the GN's caribou collaring program is currently being addressed through separate discussions to develop an Agreement between Agnico Eagle and the GN. This information will be regularly used to its full value as part of annual or 3-year monitoring reports.

<b>Interested Party:</b>	<b>GN</b>	<b>Rec No.:</b>	<b>GN-IR-07</b>
<b>Re:</b>	<b>Noise</b>		

**Recommendation Made by Interested Party:**

*With respect to the disposition of this issue, the GN requests the Proponent provide the following information:*

1. *Explain what equipment is being referred to in Table 14 where it states that “Equipment noise control systems will be maintained” and “Regular maintenance of equipment to limit noise”;*
2. *Clarify whether the saline water pipelines or any associated equipment will produce noise or vibration audible to people or wildlife; and*
3. *If noise or vibration will be produced by this infrastructure, please characterize it in terms of duration, frequency, intensity, and distribution:*
  - *What noise or vibration will be produced by this infrastructure for the buried versus unburied portions?*

**Agnico Eagle’s Response to Recommendation:**

**Part 1**

Noise associated with the waterline would be in relation to construction equipment, which will include 1-2 m<sup>3</sup> excavators, 10-wheel tandem trucks, 50 tons cranes and telehandlers. Standard noise mitigation for this type of equipment are mufflers on the engine exhaust and regulator maintenance of all machinery.

**Part 2**

Equipment associated with the waterline and infrastructures on the mine site (as described above) does not cumulatively increase the noise from the mine site. The two waterlines will be covered and based on analysis in other jurisdictions with pipelines, the pipelines will not produce noise or vibration audible to people or wildlife. The Canadian Energy Regulator (formerly the National Energy Board) does not require noise and vibration assessments for the operation of pipelines. The Canadian Energy Regulator filing manual (2020) requires an assessment for pipeline construction noise as Canadian Energy Regulator noise assessments for operations are restricted to facilities like pump stations, compressor stations (i.e., facilities that include above ground machinery).

There are noise emissions anticipated from the waterline itself. The project design does not include pumps along the waterline to move the water; therefore, no noise source while the waterline is in operations.

**Part 3**

The waterline itself should not produce any vibration, regardless of whether it is covered or uncovered. Any ground vibration that may occur would stem from construction activities through the movement of heavy equipment. It is anticipated that vibration levels would decay below the threshold of detectability within several tens of meters. Shannon and Wilson Inc. (2013) found that small diameter lines with lighter contents are more susceptible to wind induced vibrations; however, 80 to 90% of the waterline will be covered and not exposed to wind.

For additional context, the Federation of Canadian Municipalities (FCM 2013) Proximity Guidelines and Best Practices requires vibration assessments to be undertaken in cases where new residential dwellings are being proposed for development within 75 m of a railway mainline. In other words, vibration from fully loaded freight trains decays below the threshold of detectability within 75 m of the track thus vibrations from a waterline would be expected to be limited.

**References:**

Canada Energy Regulator. 2020 Filing Manual. Available at: <https://www.cer-rec.gc.ca/en/applications-hearings/submit-applications-documents/filing-manuals/flngmnl-eng.pdf>

FCM (Federation of Canadian Municipalities). 2013. Guidelines for New Development in Proximity to Railway Operations. May 2013. Available at: [http://proximityissue.wpengine.com/wp-content/uploads/2017/09/2013\\_05\\_29\\_Guidelines\\_NewDevelopment\\_E.pdf](http://proximityissue.wpengine.com/wp-content/uploads/2017/09/2013_05_29_Guidelines_NewDevelopment_E.pdf)

Shannon and Wilson Inc. 2013. Arctic cold regions oil pipeline conference report. Alaska Department of Environmental Conservation Division of Spill Prevention and Response Industry Preparedness Program. Anchorage, Alaska 99501.

## **HEALTH CANADA (HC)**

<b>Interested Party:</b>	<b>HC</b>	<b>Rec No.:</b>	<b>HC-IR-01</b>
<b>Re:</b>	<b>Noise</b>		

**Recommendation Made by Interested Party:**

*Health Canada suggests that NIRB request the following information from the proponent:*

*Provide an updated version of the NAMP (or an addendum) describing the monitoring and mitigation plans, including a noise complaint mechanism, that will be implemented during the pre-construction and construction phases of the project to address noise-related health risks and concerns.*

*The Proponent should refer to the Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise. (<https://www.ceaa.gc.ca/050/documents/p80054/119378E.pdf>)*

**Agnico Eagle's Response to Recommendation:**

The waterline assessed noise as part of sensory disturbance to wildlife and did not look at noise as an impact to human health because using a waterline was considered a positive impact rather, with the reduction in truck traffic over the course of operations. An interaction between noise and construction of the waterlines was identified as an interaction with potential to impact terrestrial wildlife and was carried through the effects assessment and noise was assessed as a sensory disturbance to wildlife.

A noise assessment was previously completed for construction of the Rankin Inlet bypass road and associated activities in Itivia quarry (Golder 2017, Appendix IR-13 of this response package). The noise assessment found that existing noise levels within Rankin Inlet range from 54 to 64 A-weighted decibels (dBA) during the daytime period (7 am to 11 pm) and from 45 to 52 dBA during the nighttime period (11 pm to 7 am). A computer model was used to quantify noise level increases resulting from construction of the bypass road and associated activities in Itivia quarry. This computer model predicted that construction activities would increase daytime noise levels between 0.0 and 0.2 dBA, which is considered a negligible magnitude effect, and would increase nighttime noise levels between 0.1 and 3.1 dBA, which is considered a low magnitude effect. Based on this analysis, the assessment concluded that noise effects from the construction activities would be not significant.

It is recognized that noise will occur during the construction of the waterline, including the marine installation, but waterline construction activities are expected to be comparable to or less intense than construction of the Rankin Inlet bypass road and the Itivia laydown area. Consequently, the results of the previous noise assessment for construction of the bypass road can be used to justify the conclusion that noise effects from waterline construction will be not significant for human receptors within Rankin Inlet.

Tusaajugut, the formal Agnico Eagle Nunavut Community Complaints System, addresses concerns from individuals and organizations in the Kivalliq region about environmental issues, tendering and hiring processes, or any other aspects of Agnico Eagle's operations. Agnico Eagle launched Tusaajugut in February 27 and has received 33 complaints. This system will also be used for noise complaints. Given the limited impacts from noise to people and the existing complaint mechanism, Agnico Eagle does not believe that an updated version of the NAMP or an addendum is required.

**References:**

Golder (Golder Associates Ltd.). 2017. *Predictive Noise Effects Assessment: Construction of the Rankin Inlet Bypass Road and Associated Activities in Itivia Quarry*. Prepared for Agnico Eagle Mines Ltd. Meliadine Division. Dated March 15, 2017.

Tusaajugut website Available at:

[http://aemnunavut.ca/tusaajugut/?fbclid=IwAR0HgDdLNF4qtxfamczPUcx0M6ScxWP7ImCF\\_e-pld9rC9yW8KBt0szdXdU](http://aemnunavut.ca/tusaajugut/?fbclid=IwAR0HgDdLNF4qtxfamczPUcx0M6ScxWP7ImCF_e-pld9rC9yW8KBt0szdXdU)

<b>Interested Party:</b>	<b>HC</b>	<b>Rec No.:</b>	<b>HC-IR-02</b>
<b>Re:</b>	<b>Air quality/dust; Country foods</b>		

**Recommendation Made by Interested Party:**

*Health Canada suggests that NIRB request the following information from the proponent:*

*Provide updated versions of the AQMP Plan and the DMP (or two addendums) describing the monitoring and mitigation plans, including a quantification of air emissions emitted from the project pre-construction and construction activities in order to assess potential human health risks related to air quality.*

*The Proponent should refer to Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality. (<https://www.acee.gc.ca/050/documents/p80054/119376E.pdf>)*

**Agnico Eagle's Response to Recommendation:**

Air quality effects were not assessed in August 2020 FEIS Addendum, because construction and operation of waterline was predicted to be a reduction in dust and emissions over the life of mine compared to hauling treated effluent. However, since the submission of the August 2020 FEIS Addendum, Agnico Eagle committed to cover 80-90% of the waterlines. It is anticipated the covering the waterlines during construction will create air emissions. These emissions are assessed qualitatively in Appendix IR-8 of this response package. At this time Agnico Eagle is not updating the Air Quality Monitoring Plan or Dust Management Plan. Mitigation measures that would be put in place to manage dust include:

- Minimize dust-generating activities, as practicable and where required, during periods of high wind to limit dust emissions and spread.
- Use of dust suppression methods as outlined in the *Nunavut Environmental Protection Act*.
- Use of gravel in the covers to minimize dust during construction.
- Application of water to roadways during periods where water application would not result in any safety hazards during waterline construction.
- All mobile vehicles and mine equipment will meet the applicable emission standards at time of purchase. Newer equipment was assumed to comply with Tier 3 emission standards.

Agnico Eagle will present more details of the dust construction best practices in the 30-day notice that will be issued to regulators prior to the beginning of the work.

Additional measures are also listed in ECCC-IR-1.



<b>Interested Party:</b>	<b>HC</b>	<b>Rec No.:</b>	<b>HC-IR-03</b>
<b>Re:</b>	<b>Human health risk assessment</b>		

**Recommendation Made by Interested Party:**

*Health Canada suggests that NIRB request the following information from the proponent:*

*Provide an HHRA in accordance with the requirements set out in the NIRB's 2020 Impact Statement Addendum Guidelines, to allow the assessment of potential human health risks related to this project. The Proponent should refer to Guidance for Evaluating Human Health Impacts in Environmental Assessment: Human Health Risk Assessment. <https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-risk-assessment.html>*

**Agnico Eagle's Response to Recommendation:**

In the original FEIS for the Meliadine Project (Agnico Eagle 2014), emissions during the operations phase of the project were predicted and evaluated with respect to potential adverse effects to human health as part of the risk assessment. All risks were acceptable with respect to PM<sub>10</sub> and PM<sub>2.5</sub> during the operations of the Meliadine Mine including the AWAR considering that several air quality mitigation measures would be in place as listed below (reproduced from Table 10.1-3 of Volume 10 of the Meliadine FEIS, Agnico Eagle 2014):

- Best management practices to control fugitive particulate emissions from haul roads and material handling
- Sources of particulate emissions at the processing facility are controlled through the use of baghouses
- Enclosures are used to reduce fugitive emissions at the processing facility
- Exhaust emissions from non-road vehicles will be managed through purchasing equipment that meet Tier 3 emission standards
- Exhaust emissions from non-road vehicles will be managed through regular and routine maintenance of vehicles
- SO<sub>2</sub> emissions from non-road vehicles and stationary equipment will be reduced through the use of diesel fuel with less than 15 ppm of sulphur

The contributions from both the mine and the AWAR during operations were considered in the predicted dust emissions. The risk assessment found that upon comparison to the Canada Wide Standard relevant at the time for PM<sub>2.5</sub> (30 µg/m<sup>3</sup>; CCME 2000) and the World Health Organization air quality guideline for PM<sub>10</sub> adjusted using the site-specific ratio of PM<sub>10</sub>/PM<sub>2.5</sub> (40 µg/m<sup>3</sup>; WHO 2005) all concentrations in the LSA (cabins, a park and Rankin Inlet) and within the project footprint at the on-site worker camp met the standards. Specifically, at cabin locations around the mine site and along the AWAR, concentrations of both PM<sub>2.5</sub> and PM<sub>10</sub> were all at least 10 times lower than their respective standard/guideline; at the on-site worker camp, concentrations were slightly lower than the selected guidelines.

The predicted emissions from the FEIS can be compared to monitoring data collected in 2018 (Agnico Eagle 2019) and 2019 (Agnico Eagle 2020) from the mine site during operations phase, which includes use of the AWAR (note that operations phase was considered to be higher in emissions than the construction phase, including construction of the AWAR). Monitoring data were collected at the perimeter of the Site, and as such the on-site monitoring data are compared to the FEIS predictions for the on-site worker camp. As shown in Table 5 of the 2018 annual monitoring report (Agnico Eagle 2019) and Table 5 of the 2019 annual monitoring report (Agnico Eagle 2020), the concentrations of suspended particulates (PM<sub>2.5</sub> and PM<sub>10</sub>) were well within the selected regulatory guidelines and the FEIS predictions as shown in Table 1 below:

**Table 1: Summary of 2018 and 2019 Annual Air Quality Monitoring Results for PM<sub>2.5</sub> and PM<sub>10</sub>**

Parameter	Regulatory Guideline	2018-2019 Monitoring Results (Min-Max)	FEIS Predictions for the On-Site Worker Camp
PM <sub>2.5</sub>	28	1.12-2.67	26.5
PM <sub>10</sub>	50	2.1-4.92	32.8

As shown above, the monitoring results are approximately 10 times lower than the FEIS predictions. Additionally, these monitoring stations are close to the mine site during operations, which is expected to be associated with higher emissions than the construction phase of the original Meliadine Project which includes construction of the AWAR. As a result, it is considered reasonable to conclude that particulate emissions during construction of the waterline will be similarly low and well within regulatory guidelines, thus not necessitating a quantitative risk assessment.

#### **References:**

- Agnico Eagle (Agnico Eagle Mines Ltd.). 2014. Volume 10.0 – Environmental and Human Health Risk Assessment. Final Environmental Impact Statement (FEIS) – Meliadine Gold Project, Nunavut. Report Number Doc 228-1314280007 Ver. 0. Prepared by Golder Associates Ltd.
- Agnico Eagle. 2019. 2018 Air Quality Monitoring Report. In Accordance with NIRB Project Certificate No. 006. Prepared by Agnico-Eagle Mines Limited, Meliadine Division. March 2019.
- Agnico Eagle. 2020. 2019 Air Quality Monitoring Report. In Accordance with NIRB Project Certificate No. 006. Prepared by Agnico-Eagle Mines Limited, Meliadine Division. April 2020.
- CCME. 2000. Canada-wide standards for particulate matter (PM) and ozone. CCME Council of Ministers. June 2000. Quebec City, QC.
- WHO. 2005. Air Quality Guidelines Global Update. Report on Working Group Meeting. Bonn, Germany.

## **KANGIQLINIQ HUNTERS AND TRAPPERS ORGANIZATION (KHTO)**

<b>Interested Party:</b>	<b>KHTO</b>	<b>Rec No.:</b>	<b>KHTO-IR-1</b>
<b>Re:</b>	<b>Modification during assessment</b>		

**Recommendation Made by Interested Party:**

*Should this not trigger a delay in assessment due to sections 141-143 of the Nunavut Planning and Project Assessment Act? The Intervenor has been reviewing a document that will not be included in the impact statement and community support has been based on that important very important detail.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle notes the KHTO has directed this response to the NIRB to address; however, Agnico Eagle has provide a response related to this question.

The additional mitigation identified (i.e., burying portions of the waterline) was the direct result of Agnico Eagle developing additional mitigation measures in regard to the installation of the waterline to address requests and concerns of the community raised as part of the NIRB process and community consultation. Identification of suitable mitigations is one of the primary functions of the NIRB process. Agnico Eagle will respond to information requests and technical comments from parties on this proposed mitigation during the NIRB reconsideration process. As is the normal course, it is expected that parties to the NIRB process will review the impact statement together with all materials subsequently filed with the NIRB as part of the reconsideration process.

<b>Interested Party:</b>	<b>KHTO</b>	<b>Rec No.:</b>	<b>KHTO-IR-2</b>
<b>Re:</b>	<b>Terrestrial Impacts and Monitoring</b>		

**Recommendation Made by Interested Party:**

*Will AEM be providing a new Terrestrial section for the EIS addendum which will include different methodology for monitoring?*

**Agnico Eagle's Response to Recommendation:**

The current monitoring that is completed within the TEMMP (2020) will be sufficient for monitoring any additional requirements or concerns related to the proposed development of the waterlines. For more information on the monitoring program for the AWAR and waterline, please refer to KivIA-IR-08.

## **KIVALLIQ INUIT ASSOCIATION (KIVIA)**

<b>Interested Party:</b>	KivIA	<b>Rec No.:</b>	KivIA-IR-1
<b>Re:</b>	Socio-economic benefits to Inuit		

**Recommendation Made by Interested Party:**

*Please clarify how the benefits to local workers will be maintained should the COVID-19 pandemic persist.*

**Agnico Eagle's Response to Recommendation:**

The total workforce required for the waterline would be approximately 35 direct/indirect workers during construction. The target for Inuit employment is 10 to 14 (30%) of those workers to be hired from NTI firms to work on the waterline construction. To do so, Agnico Eagle will enforce working procedures that are in place to respect our COVID "No Contact" protocol. The Agnico Eagle Nunavumiutt employees, currently on temporary layoff, will be available to be contracted by the NTI firms for construction of the waterlines.

<b>Interested Party:</b>	<b>KivIA</b>	<b>Rec No.:</b>	<b>KivIA-IR-2</b>
<b>Re:</b>	<b>20,000 m3/day alternative and the discharge of surface contact water</b>		

**Recommendation Made by Interested Party:**

*Agnico Eagle should complete a full environmental assessment of the 20,000 m3/day alternative including the discharge of surface contact water from the site to Melvin Bay. This assessment should fully link the NIRB and NWB applications, and include:*

- a) Water quality and hydrodynamic modelling of blended surface and ground water quality discharged to Melvin Bay at rates of up to 20,000 m3/day.*
- b) Water balance modelling for the Meliadine site, including Meliadine Lake, to determine the influence of diverting all surface contact water to Melvin Bay on both site water management, and water levels in Meliadine Lake.*

*Note that the full environmental and socio-economic assessment should include a freshwater use volume of 741,706 m3/year for Operations at Meliadine as currently proposed within the NWB water licence amendment application.*

**Agnico Eagle's Response to Recommendation:**

**Part A**

Agnico Eagle refers KivIA to Hydrodynamic modelling presented in the Appendix IR-9 of the response package.

**Part B**

Agnico Eagle refers KivIA to Meliadine Lake Assessment presented in the Appendix IR-2 of this response package.



<b>Interested Party:</b>	KivIA	<b>Rec No.:</b>	KivIA-IR-3
<b>Re:</b>	HDPE pipe capacity		

**Recommendation Made by Interested Party:**

*Please identify the maximum velocity for a high-density polyethylene (HDPE) pipe and clarify whether there are any concerns to pipeline integrity if a sustained discharge at 20,000 m<sup>3</sup>/d is required.*

**Agnico Eagle's Response to Recommendation:**

Please refer to response provided in CIRNAC-IR-3b; and Appendix IR-1 of this response package.

<b>Interested Party:</b>	<b>KivIA</b>	<b>Rec No.:</b>	<b>KivIA-IR-4</b>
<b>Re:</b>	<b>Mid and far field water quality in Melvin Bay</b>		

**Recommendation Made by Interested Party:**

*Agnico Eagle to provide mid and far field model water quality and hydrodynamic modelling for Melvin Bay using 6,000 m<sup>3</sup>/day, 12,000 m<sup>3</sup>/day and 20,000 m<sup>3</sup>/day discharge scenarios. Model scenarios should include both the discharge of groundwater alone, and the blended discharge of surface contact water from the Meliadine Site with groundwater.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle has undertaken three-dimensional (3D) hydrodynamic modelling describing the fate of discharge to Melvin Bay, which evaluates mid and far field conditions in the bay as a result of the discharge. Please refer to Appendix IR-9 of this response package for the Melvin Bay hydrodynamic model report.

As part of the proposed diffuser design in Melvin Bay conducted in April (Appendix A of the August 2020 FEIS Addendum), modelling using the US-EPA Visual Plumes assessed mixing potential of the discharge in the near-field for nominal flows of 6000 m<sup>3</sup>/day to 12,000 m<sup>3</sup>/day, as well as the 20,000 m<sup>3</sup>/day contingency discharge scenario. The modelling concluded that effective dilutions were achieved in the near-field (i.e., within a 100 m mixing zone).

The 3D modelling investigated the fate and behaviour of the discharged effluent over the entire Melvin Bay for the 6,000 m<sup>3</sup>/day and 12,000 m<sup>3</sup>/day discharge scenarios, including the 20,000 m<sup>3</sup>/day contingency discharge scenario, with constant TDS concentrations in the discharge at 39,400 mg/L. This hydrodynamic modelling also evaluated potential accumulation of the discharge in the bay on an annual basis accounting for spatially- and temporally-varying ocean currents (and ocean conditions; i.e. temperature and salinity) in the vicinity of the diffuser and within the bay. Discharge will be timed for June through October for each year of operations. Modelling results, including the 20,000 m<sup>3</sup>/day contingency discharge scenario, indicate a flushing efficiency within the bay, resulting in no residual accumulation of effluent on a year-by-year basis.

<b>Interested Party:</b>	<b>KivIA</b>	<b>Rec No.:</b>	<b>KivIA-IR-5</b>
<b>Re:</b>	<b>Divergence from SWTP design criteria</b>		

**Recommendation Made by Interested Party:**

*Agnico Eagle to clarify why the SWTP was unable to achieve design criteria. Agnico Eagle to also provide a discussion as to whether problems meeting SWTP design criteria may compromise the capacity to meet discharge criteria at the diffuser in Melvin Bay. This discussion should consider both the discharge of groundwater alone as well as blended surface and subsurface contact water.*

**Agnico Eagle's Response to Recommendation:**

The status of the SWTP (i.e., status, challenges, and mitigations measures) is presented in response to CIRNAC-IR-2.

<b>Interested Party:</b>	<b>KivIA</b>	<b>Rec No.:</b>	<b>KivIA-IR-6</b>
<b>Re:</b>	<b>Water balance model scenarios</b>		

**Recommendation Made by Interested Party:**

*Please update the water balance model with an additional assessment scenario accounting for increased groundwater inflows (i.e. a sensitivity analysis) or provide clarification as to why the current groundwater predictions presented in the 2020 addendum are considered sufficiently conservative.*

*Please clarify whether 12,000 m<sup>3</sup>/day is a sufficient maximum discharge volume for the current application or whether 20,000 m<sup>3</sup>/day should be included in the waterline application to manage saline groundwater regardless of whether discharges to Melvin Bay include surface contact water from the Meliadine Site.*

**Agnico Eagle's Response to Recommendation:**

The water balance model already assumes an upper bound estimate from sensitivity analysis completed on groundwater inflows to the Tiriganiaq Underground (refer to Appendix IR-10 of this response package). Since the original FEIS was completed in 2014 supplemental hydraulic testing has been conducted that includes 24 additional packer tests, two pumping tests and two injection tests to further characterize and refine the hydraulic conductivity of the bedrock. These field measurements have also been supplemented by hydraulic head monitoring data measured at piezometers during mining and underground inflow measurements to support calibration/verification of model predictions. The larger data set and model calibration provide increased confidence in the base case predictions.

Despite the increased confidence and to be conservative, the water balance does not use the base case predictions and instead uses the higher predicted flows from the sensitivity scenario assuming the bedrock hydraulic conductivity is a factor of 3 higher than the values used in the base case model predictions. Considering the larger data set and supporting model calibration, this scenario is considered to be a reasonable upper bound estimate of groundwater inflows to be managed underground and additional sensitivity analysis is not required. The predictions also do not account for the effects of grouting which is being utilized effectively in the underground to reduce inflows from what is predicted by the numerical model.

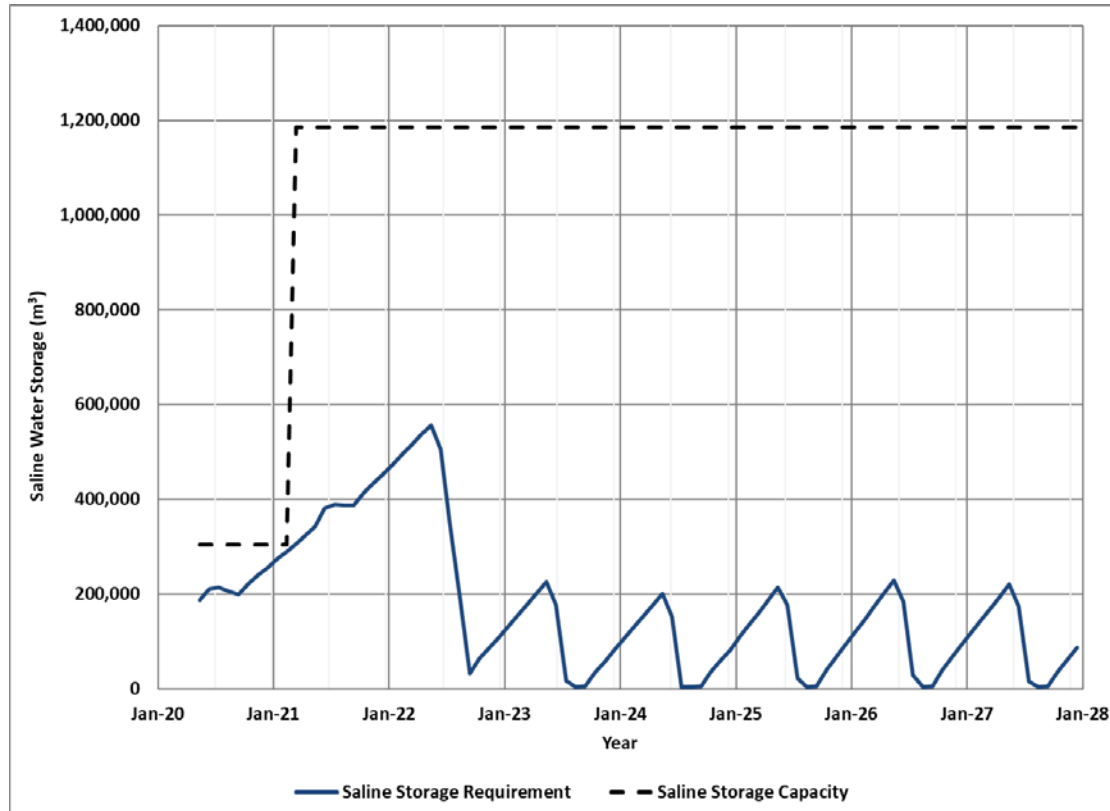
Interested Party:	KivIA	Rec No.:	KivIA-IR-7
Re:	Saline water and surface water storage facilities on the Meliadine mine site.		

**Recommendation Made by Interested Party:**

*The KIA would like demonstration that there is sufficient storage capacity on site to avoid the need for another “emergency discharge”. Please provide a table that contains the total amount for each of saline and surface water that will require storage on the Meliadine mine site prior to the 2021 open water season. The KIA also would like a table stating the capacity of all current storage ponds and a diagram showing the location of these storage ponds. The KIA would also like a table stating the capacity of all storage ponds (saline and fresh water) and a diagram showing the location of these storage ponds in each year / phase of the life of the mine.*

**Agnico Eagle’s Response to Recommendation:**

As per Figure 1 of the Meliadine Saline Water Balance and Water Quality Model – Saline Water Management (Appendix H of the August 2020 FEIS Addendum) and presented in Figure KivIA-IR-7a below, a peak storage volume of 556,396 m<sup>3</sup> of saline water is predicted to be stored at the Meliadine Mine by May 2022. The combined saline water storage capacity available in SP1, SP4, and Tiriganiaq 2 Pit from 2021 to 2027 is 1,184,852 m<sup>3</sup>. Table KivIA-IR-7a below shows the available saline storage capacity over the mine life. The locations of the ponds and Pit are shown in response to NIRB-IR-002.



**Figure KivIA-IR-7a: Saline Storage Requirements and Available Storage Capacity**

**Table KivIA-IR-7a: Saline Storage Requirements and Capacity**

Year	Saline Storage Requirement (m <sup>3</sup> )	Saline Pond / Open Pit Capacity (m <sup>3</sup> )				
		SP1	SP2 <sup>1</sup>	SP4 <sup>2,3</sup>	Tiri2	Total <sup>4</sup>
2020	288,769	32,000	-	272,122	-	304,122
2021	453,238	32,000	-	<i>272,122</i>	1,152,852	1,184,852
2022	556,396	32,000	-	<i>272,122</i>	1,152,852	1,184,852
2023	225,414	32,000	-	<i>272,122</i>	1,152,852	1,184,852
2024	200,666	32,000	-	<i>272,122</i>	1,152,852	1,184,852
2025	214,107	32,000	-		1,152,852	1,184,852
2026	228,669	32,000	-		1,152,852	1,184,852
2027	219,771	32,000	-		1,152,852	1,184,852

Notes:

1. SP2 was decommissioned in April 2020 and is not included in storage calculations
2. The capacity of SP4 has been updated based on the as-built capacity (previous design value presented in the 2020 Water Management Plan was 233,133 m<sup>3</sup>)
3. *Italicized, gray* values are contingency storage only
4. Excludes contingency storage

<b>Interested Party:</b>	<b>KivIA</b>	<b>Rec No.:</b>	<b>KivIA-IR-8</b>
<b>Re:</b>	<b>Unsubstantiated justification that the proposed twin 16" waterlines will not prevent caribou passage.</b>		

**Recommendation Made by Interested Party:**

*The Proponent should provide:*

- A) A review of the literature regarding caribou and pipeline/waterline crossings;*
- B) Summaries with references to support claims that a twinned 16" waterline will not delay or deflect caribou passage;*
- C) Justification with references that two waterlines spaced 60 cm apart will affect caribou the same as a single waterline (as the Proponent seems to imply); and*
- D) Justification why placing the waterlines away from the road will not be better mitigation to reduce delay and deflection of caribou passage.*

**Agnico Eagle's Response to Recommendation:**

The KivIA are requesting additional support for the waterline design as described in the August 2020 FEIS Addendum . Since the publication of that document, Agnico Eagle has conducted consultation and in response to concerns over caribou, Agnico Eagle has committed to cover 80-90% of the waterline.

With this cover in place, caribou are expected to cross the road-waterline structure in the same way they currently cross the road. Caribou will not have to cross an un-covered waterline or use crossing structures. Therefore, this Information Request for literature on caribou crossing an uncovered waterline is no longer relevant.

This response describes the process that Agnico Eagle followed to design mitigation measures for caribou on the waterline. Agnico Eagle consulted with Inuit Elders, Kangiqliniq Hunters and Trappers Association (KHTO), Baker Lake Hunters and Trappers Association (BLHTO), Rankin Inlet Community Lands and Resources Committee (CLARC) and community members to identify Inuit Qaujimajatuqangit (IQ), Traditional Knowledge (TK) and land-user perspectives on the waterline. Agnico Eagle also referenced scientific studies and best management practices for waterlines and caribou.

Agnico Eagle's proposal on the waterline evolved throughout each phase of the consultation process with different community groups in 2020. IQ was incorporated in the design at many levels. Based on the feedback from community members, Agnico Eagle has adapted the design, starting with a single waterline alone with a 20-inch diameter to 2 lines of 16-inches diameter to reduce potential impact on caribou movement. Moreover, Agnico Eagle added a commitment to construct 70 crossings on the waterline (one every 500 m), and finally a commitment to cover 80-90% of the waterline. This process is described below.

The first iteration of the waterline was designed as a single 20-inch (50 cm) high-density polyethylene (HDPE) laid beside the road from the Meliadine Mine to the discharge point south of Rankin Inlet. This first iteration was proposed by engineers as the simplest way to move water to the ocean.

Agnico Eagle understands the importance of caribou migration and of caribou to the livelihood and culture of the Inuit. IQ collected for the Project indicates that caribou periodically travel through the middle area

of the AWAR, with up to 6-12 years between periods when there are large groups of caribou in the area. “The KHTO discussed the movement of caribou and noted that there are definite fluctuations in caribou populations, and that caribou alter their migration patterns in response to predators, snow conditions, and food availability” (Agnico Eagle 2020). Land users indicated that the AWAR is used for harvesting when caribou are present, particularly in the area north of the Meliadine River.

Before proposing a 20-inch waterline, Agnico Eagle evaluated the current scientific research on what types of obstacles caribou can cross, and the standard mitigation measures used at other mines in the Arctic and in the south, for woodland caribou. This review of the scientific literature indicated that caribou could likely cross a structure of 20” (50 cm) because they can cross snowbanks of this height. In addition, best management practices for waterlines and pipelines in the Arctic and south include crossing ramps as standard mitigation procedures.

In response to concerns raised during the initial consultation process about whether caribou would cross the waterline and following best practices for waterlines, Agnico Eagle updated the design of the waterline to be two 16-inch (40 cm) waterlines with periodic crossings to allow caribou to cross the waterline. This design was included in the August 2020 FEIS Addendum.

Agnico Eagle conducted a first round of consultation with Inuit Elders, Inuit Organizations and Communities between January and March 2020, using the twin 16–inch waterline with periodic crossings as a design for discussion. These discussions were carried out in person, until the Covid-19 related restrictions imposed by Nunavut Chief Public Health Officer after which, discussions were carried out using compliant COVID-19 engagement procedures and digital engagement tools.

The first round of consultations began in January 2020. Agnico Eagle described the twin 16-inch waterline with crossing structures for caribou, ATVs, and snowmobiles. Wildlife concerns made up approximately 24% of the questions and comments on the waterline, with concerns expressed that caribou may not be able to cross the waterline and requesting additional crossing structures or for the waterline to be buried.

Example comments gathered during the first round of community consultation (Agnico Eagle Waterline Consultation Report, August 28 2020):

- “I don't think that the caribou can jump over the pipe - it should be buried under the road.” – Public Meeting Booth
- “Will the waterline be buried?” – Hamlet Meeting

During June 2020, Agnico Eagle hosted a group of Inuit Elders to the Meliadine Mine where demonstration waterlines had been laid on the tundra near the road. Feedback from Inuit Elders indicated that concern that caribou may not cross the waterline and suggested more frequent crossing locations or covering the waterline to assist caribou in crossing.

In response to these consultations, Agnico Eagle proposed Waterline Commitments #1 through 4 to install additional crossings – 70 in total, one every 500 m – with locations to determined based on TK and



scientific studies, and including long-term monitoring described in the Terrestrial Ecosystem Management and Monitoring Plan (TEMMP 2020).

A second round of consultations were conducted in July and August 2020, where community members raised concerns about caribou crossing the waterline despite the commitment for 70 crossing ramps. 17% of comments were about caribou, crossings or burying the waterline. There were also several questions about whether it was possible to cover the waterline to allow caribou to cross.

Example comments gathered during the second round of community consultation (Agnico Eagle Waterline Consultation Report, August 28, 2020 [NIRB Public Registry ID 331287]):

- “Might not be safe for snowmobilers and ATV riders to come across the pipeline so that line should be buried.” – Meeting with Rankin Inlet HTO & KWB
- “Would prefer to see the waterlines buried with sand as it allows for natural growth overtime. They expressed that they are very knowledgeable in caribou migration routes and would like to see Elders help identify routes.” – Open house participant
- “Why not cover the entire pipeline because we do not know where the caribou will migrate across. Because AEM is going to be around, it should be covered.” – Meeting with Rankin Inlet CLARC

Based on continued concern from community members about whether caribou would cross the waterline, Agnico Eagle decided to install a cover on 80-90% of the waterline, and this has been added as Commitment #9 (NIRB Public Registry ID 331287):

*Agnico Eagle will bury/cover between 80-90% of the waterline and will continue to work with the HTO, KIA, Elders, and the community on site specific locations. This will replace Commitment 1 to build crossings if this is the preferred mitigation method.*

The waterline will be located on the tundra beside the existing road, covered with a layer of esker material. The construction of the waterline cover is displayed in Figure KivIA-IR-8a. The waterline cover is planned to be at most 80 cm tall where excavation is not possible (from the tundra to the top of the cover) which will place it below the level of the road surface, so will not produce a visual or physical barrier to caribou. The road profile will be unchanged on the west side, but on the east side, will have a step down from the road surface, and then a second step down to the tundra. The existing AWAR has been constructed with a feathered edge, with a slope that generally varies between 1:2.5 and 1:3 (rise:run). The cover over the waterline will be constructed with a planned side slope of 1:2.5.

The planned cover will be composed of esker material. Large sections of the AWAR are made of this material, as are the ATV crossings on the existing on-site waterline at Meliadine. This material provides for a firm substrate that allows people, caribou and ATVs to cross easily.

In some cases, the waterline will not be covered. These locations include, watercourse crossings and in rock cuts and rocky ground where a cover could damage the waterline.

Preliminary design of the waterline cover indicates that uncovered sections on the road amount to approximately 8% of the length. Planned exposed sections are quite short, with an average of approximately 90 m in length (Q1: 34.5 m, Q3: 106 m).



**Figure KivIA-IR-8a. Conceptual design of waterline cover on the east side of the All Weather Access Road.**

From the perspective of a caribou, their interactions with the AWAR will remain as before, but the road surface will be wider than the current road and there will be less traffic, with the removal of water trucks.

Monitoring of road crossing by caribou is already an element of the TEMMP (2020) updated per Project Certificate No. 006 (Amendment No. 001) and the 2020 Saline Discharge Strategy and submitted by Agnico Eagle to the NIRB in June 2020. The TEMMP (2020) contains several studies designed to measure whether and where caribou cross the road. These include:

- Caribou Collaring Program (TEMMP 2020, Section 4.7)
  - “The objectives of this program are to provide information on the distribution, relative abundance, and seasonality of caribou occurring within the Project LSA (local study area), RSA (regional study area), and CESA (cumulative effects study area) in a real-time fashion as collar information is delivered to the Government of Nunavut Department of Environment (GN DoE) and shared with Agnico Eagle.”
  - Satellite collar data is also used to inform Meliadine of approaching caribou during key seasons (post-calving and early summer) when caribou use the Project site and cross the AWAR.

- Height of Land surveys are conducted when satellite collar data indicate that caribou are approaching.
- AWAR Road Surveillance and Surveys (TEMMP 2020, Section 4.3)
  - The objective of road surveillance monitoring is to record when and where wildlife interact with the Project.
  - Road surveillance involves all drivers reporting incidental observations of wildlife on or near the road.
  - Road surveys are conducted weekly in collaboration with the KHTO. Survey frequency may be increased during the summer in response to increased water truck traffic.
  - Road surveys are also conducted more frequently when caribou are near site in June and July, with an average of three surveys per day during this period in 2020.
- Caribou Behaviour Monitoring (TEMMP 2020, Section 4.5)
  - The objective of behaviour monitoring is to evaluate if caribou change their behaviours near the mine and whether they avoid the mine.
  - The methods for behaviour monitoring was updated in 2020 to follow the scan sampling methodology provided by the Government of Northwest Territories, Department of Environment and Natural Resources (GNWT ENR).

Agnico Eagle has also committed to additional monitoring that will inform adaptive management (Commitment #4; NIRB Public Registry ID 331287). This monitoring includes:

- Inuit Elders visit site to evaluate if caribou are crossing the road. Tracking caribou road crossing using GPS collars,
- A camera study, and
- Road surveys by KHTO Wildlife Monitor

These monitoring programs examine: a) when and where caribou interact with the road, b) the rate of deflections (caribou turning away from the road) and c) caribou behaviour near the road and in response to stimuli. These monitoring programs are sufficient to examine potential effects of the road and waterline on caribou and no additional updates are required for the TEMMP.

**Parts A), B) and C)**

As discussed above, Agnico Eagle has committed to covering 80-90% of the waterline. With this cover in place, caribou are expected to cross the road-waterline structure in the same way they currently cross the road. Caribou will not have to cross an un-covered waterline or use crossing structures. Therefore, this Information Request for literature on caribou crossing an uncovered waterline is no longer relevant.

For reference, Agnico Eagle has provided the literature review in Appendix IR-11 of this response package.

**Part D)**

Placing the waterline next to the road and then covering it, will mean that caribou are crossing a single, low gravel structure, instead of two structures. Consequently, placing the waterlines adjacent to an already known feature on the landscape that is of even lower profile than the existing AWAR and thus easier to cross, seems to be the most logical choice. In addition, there are other operational and maintenance requirements that can only be met by having the waterlines adjacent to the road.

<b>Interested Party:</b>	KivIA	<b>Rec No.:</b>	KivIA-IR-9
<b>Re:</b>	Caribou collar and sighting data		

**Recommendation Made by Interested Party:**

*The Proponent should provide:*

*A) Summary figures of collared caribou movements through the study, specifically along AWAR. These should include a temporal aspect to the records to look at annual variation in the timing of movement through the area;*

*B) Summary figures of caribou sightings from AWAR road surveys, again with a temporal component; and*

*C) Clarify on these figures where the waterline will not be buried/covered.*

**Agnico Eagle's Response to Recommendation:**

**Part A)**

See Figure KivIA-IR-9a that shows frequency of caribou crossing within each 1 km segment of the AWAR and proposed waterline alignment. In addition, the mapped surface also reflects the density of caribou walklines based on collar data to illustrate adjacent areas of high caribou use. From a timing perspective, 91% of the collar observations occur during July, 5% occur during late June (i.e., 28<sup>th</sup> - 30<sup>th</sup>), 2% occur during early August (i.e., 2<sup>nd</sup> - 4<sup>th</sup> and 8<sup>th</sup>), and 2% occurred on April 28, 2016 from one animal.

See Figure KivIA-IR-9b that shows 1) the areas where the waterline will be covered and un-covered, 2) locations of frequent crossing identified by community members during consultation, and 3) the number of caribou observed along the road during the June-July 2020 camera study.

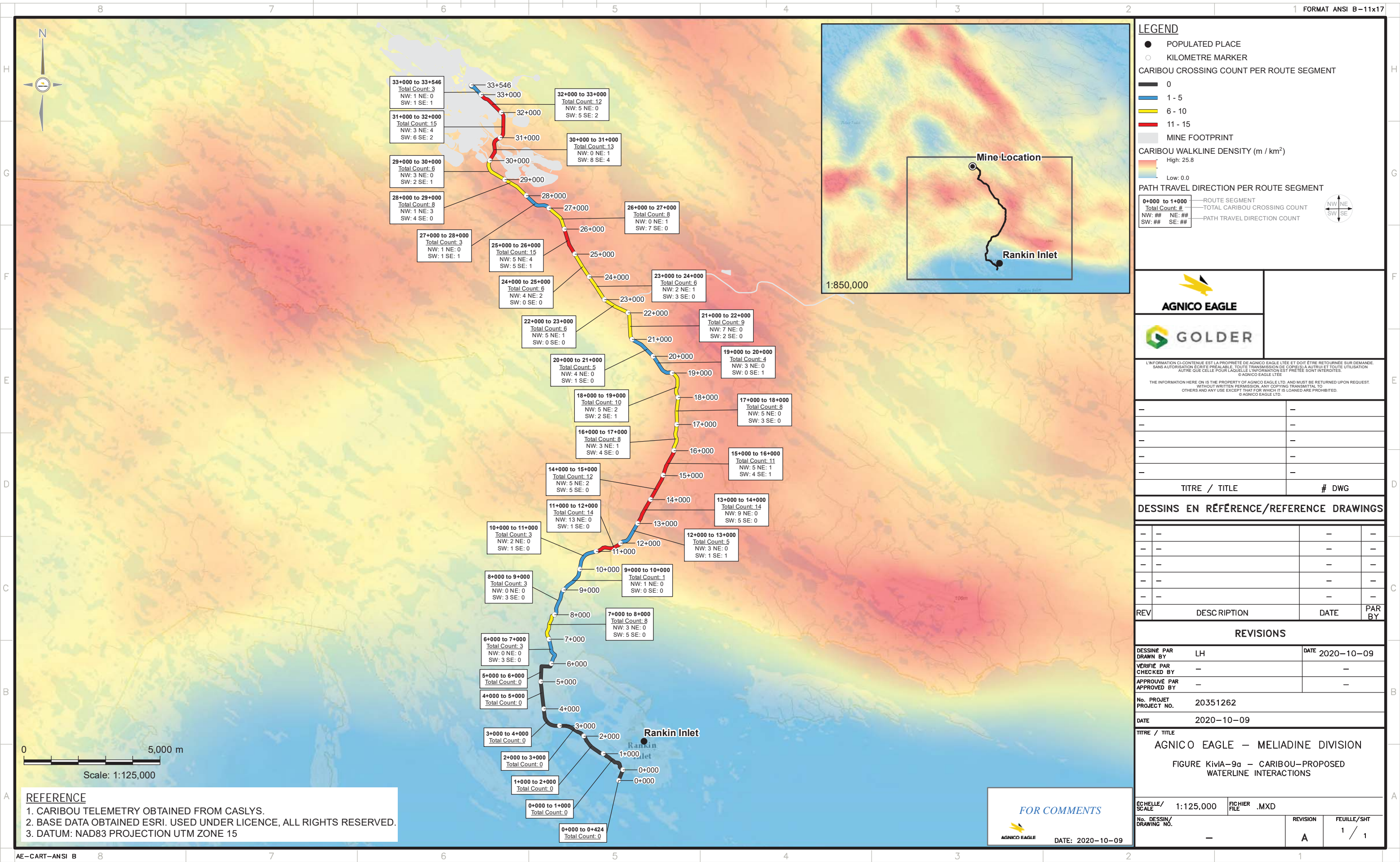
**Part B)**

The observation data has been collected and timing and number of observations are known; however, the data has not yet been entered and reviewed from a QA/QC perspective. Agnico Eagle will include the findings in the 2020 annual report.

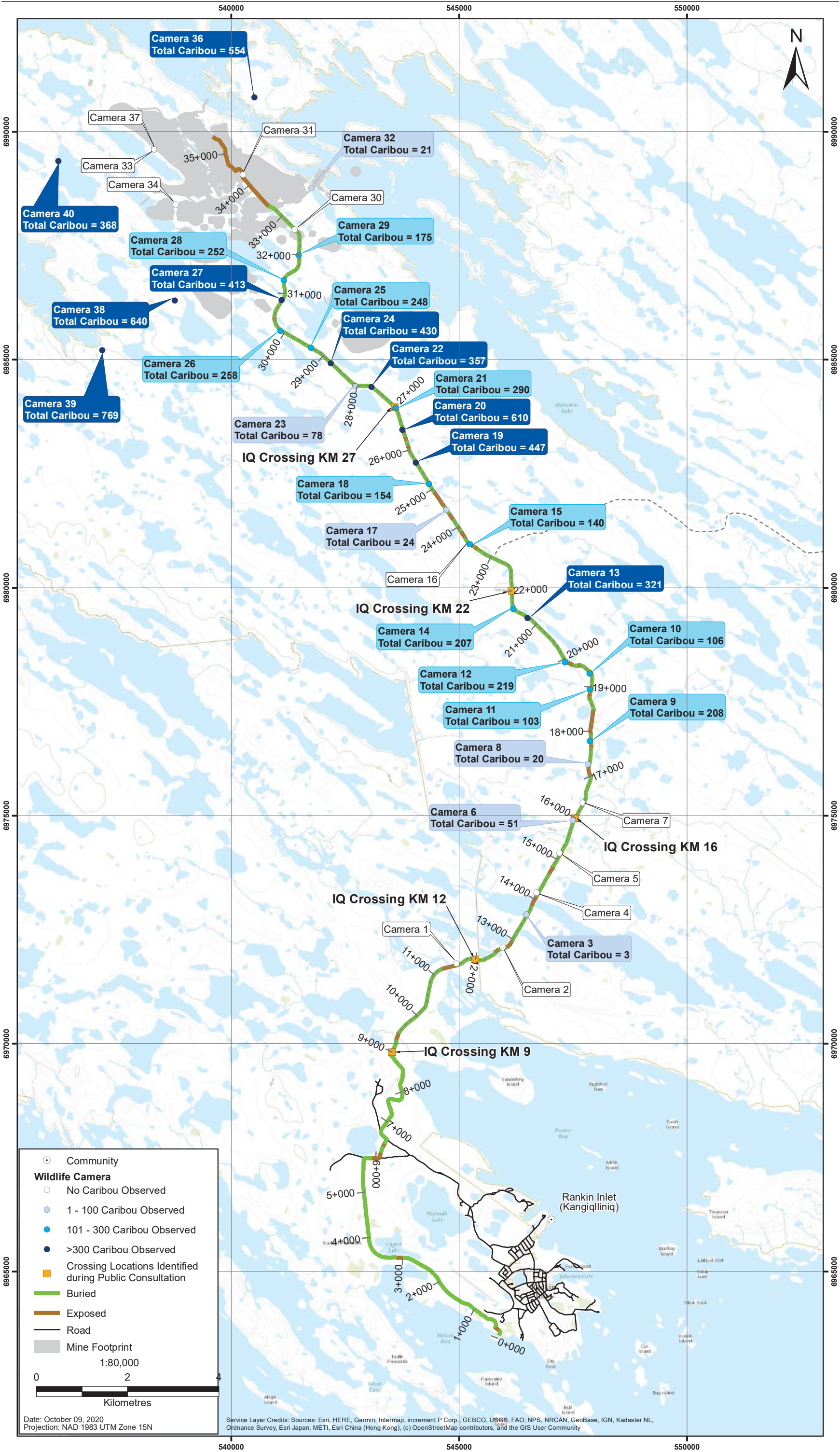
**Part C)**

See Figure KivIA-IR-9b.









**Figure KivIA-IR-9b: Meliadine Project; Areas of the Waterline Covered, Caribou Crossing Locations Identified During Consultation, and Results of July 2020 Camera Study**

<b>Interested Party:</b>	<b>KivIA</b>	<b>Rec No.:</b>	<b>KivIA-IR-10</b>
<b>Re:</b>	<b>Clarification of recent caribou behaviour and experience in Alberta</b>		

**Recommendation Made by Interested Party:**

*The Proponent should provide:*

- A) Details of the study design and a summary of the July 2020 behaviour monitoring;*
- B) Details and reference to the “experience in Alberta”;*
- C) The analysis that resulted in the conclusion that caribou may be delayed in their movements and that the waterlines would act as a temporary barrier to movement; and*
- D) A summary of the crossing structure use by caribou in other jurisdictions, including diameter and spacing of pipes/waterlines.*

**Agnico Eagle’s Response to Recommendation:**

**Part A)**

During 2020, Agnico Eagle updated the methods used for behaviour monitoring to follow the scan sampling guidelines produced by the Government of Northwest Territories, Department of Environment and Natural Resources (GNWT ENR). Behaviour monitoring occurred along Project roads and at the mine site. The results of this monitoring is scheduled to be included in the Meliadine 2020 TEMMP Report to the NIRB in March 2021.

**Part B), C), and D)**

As described in the response to KivIA-IR-08, Agnico Eagle has committed to covering 80-90% of the waterline. With this cover in place, caribou are expected to cross the road-waterline structure in the same way they currently cross the road. Caribou will not have to cross an un-covered waterline or use crossing structures. Therefore, this Information Request for literature on caribou crossing an uncovered waterline is no longer relevant.

For reference, Agnico Eagle has provided the literature review in Appendix IR-11 of this response package.



<b>Interested Party:</b>	KivIA	<b>Rec No.:</b>	KivIA-IR-11
<b>Re:</b>	Mitigation of the potential impact of the waterlines on caribou		

**Recommendation Made by Interested Party:**

*The Proponent should provide:*

- A) Confirmation and commitment whether burying/covering most of the length of the waterlines is indeed the mitigation that will be used;*
- B) Details of the design to bury or cover 80-90% of the waterline; and*
- C) The locations where the waterlines will not be buried/covered, how they align with caribou crossing data, and what mitigation will be in place to facilitate caribou movement through these areas.*

**Agnico Eagle's Response to Recommendation:**

**Part A) and B)**

As described in the response to KivIA-IR-08, Agnico Eagle has committed to covering 80-90% of the waterline. Refer to Appendix IR-6 of this response package which shows which part of the waterline will be buried.

**Part C)**

Please refer to Figure KivIA-IR-9b for the locations where the waterline will be covered and uncovered.

<b>Interested Party:</b>	KivIA	<b>Rec No.:</b>	KivIA-IR-12
<b>Re:</b>	AWAR length varies from 25 km to 30 km to 34 km.		

**Recommendation Made by Interested Party:**

*The KIA requests that the actual length of the AWAR be clearly stated and a figure clearly outlining the actual location of the AWAR be provided.*

**Agnico Eagle's Response to Recommendation:**

Refer to Appendix IR-6 of this response package which shows the AWAR/waterline and the mileage & chaining references.

<b>Interested Party:</b>	KivIA	<b>Rec No.:</b>	KivIA-IR-13
<b>Re:</b>	Width of the AWAR and the water pipeline cover.		

**Recommendation Made by Interested Party:**

*The KIA requires the accurate width of the AWAR plus the water pipeline.*

**Agnico Eagle's Response to Recommendation:**

Maximum width of the AWAR is 11 m (including pullouts), minimum width is 6 m and average width of 7 m for the AWAR. The waterlines require 3.2 m to be buried alongside the AWAR. Please also refer to Appendix IR-7.

## **KIVALLIQ WILDLIFE BOARD (KWB)**

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-1</b>
<b>Re:</b>	<b>Significant modifications to the project scope have been clarified, and the finalized scope of the project under review has not received a full impact assessment in the 2020 FEIS Addendum</b>		

**Recommendation Made by Interested Party:**

*Clarification on how the finalized project scope, which includes significant modifications from the originally proposed project impacts the review process and whether the assessment of the original project should be terminated and an assessment of the modified project should be carried out.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle notes the KWB has directed this response to the NIRB to address; however, Agnico Eagle has provided a response below.

The items identified are not a "scope change". The clarification issued on September 22, 2020 included additional mitigations (i.e. burying portions of the waterline) which was the direct result of Agnico Eagle developing additional mitigation measures in regard to the installation of the waterline to address requests and concerns of the community raised as part of the NIRB process and community consultation. Similarly, Agnico Eagle further developed the alternative of discharging groundwater and surface contact water to the marine environment in order to respond to questions and concerns raised through consultation in respect to discharges to Meliadine Lake. This matter was addressed in some detail in NIRB's correspondence of Sept. 28, 2020: *"...the items requested and the clarifications provided did not change the scope of the impacts assessed and were also not expected to affect the identification of Information Requests by organizations at this time"*.

Identification of suitable mitigations is one of the primary functions of the NIRB process. Agnico Eagle will respond to information requests and technical comments from parties during the NIRB reconsideration process following the timelines set by NIRB. As is the normal course, it is expected that parties to the NIRB process will review the impact statement together with all materials subsequently filed with the NIRB as part of the reconsideration process.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-2</b>
<b>Re:</b>	<b>Clarification about whether "potential alternative options" are under technical review.</b>		

**Recommendation Made by Interested Party:**

*Clarification on how potential alternative options should be considered by intervenors. Are they part of the project under review or not?*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle notes the KWB has directed this response to the NIRB to address.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-3</b>
<b>Re:</b>	<b>Burying the pipeline details and impacts</b>		

**Recommendation Made by Interested Party:**

*A complete Final Environmental Impact Statement Addendum that addresses all aspects of the proposed project including details about burying 80 to 90 percent of the pipeline and the potential environmental and socio-economic impacts of this proposed activity.*

**Agnico Eagle's Response to Recommendation:**

Please see Appendix IR-8 for an assessment of the potential environmental and socio-economics impacts from covering 80-90% of the waterline.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-4</b>
<b>Re:</b>	<b>Diverting up to 8,000 cm<sup>3</sup>/day of on-site treated surface contact water to the pipeline details and impacts.</b>		

**Recommendation Made by Interested Party:**

*A complete Final Environmental Impact Statement Addendum that addresses all aspects of the proposed project including diverting up to 8,000 cm<sup>3</sup>/day of on-site treated surface contact water to the pipeline for marine environment discharge and the potential environmental and socio-economic impacts of this proposed activity.*

**Agnico Eagle's Response to Recommendation:**

The August 2020 FEIS Addendum included an assessment of the saline discharge to Melvin Bay. This included an evaluation of the near-field mixing potential of discharge up to a total of 20,000 m<sup>3</sup>/day during open water conditions (Appendix A of the August 2020 FEIS Addendum). Discharge to Melvin Bay was via an engineered diffuser to facilitate dispersion within a 100 m mixing zone, at a constant TDS concentration (i.e., 39,600 mg/L) that is characteristic of the saline groundwater. The use of an elevated TDS concentration in the near-field modelling is considered a conservative approach to the assessment, because the diversion of surface contact water to the waterline discharge, if approved, would possess TDS concentrations that would be lower than this modelled assumption (refer to Appendix IR-9 of this response package for the Melvin Bay hydrodynamic model report) . The discharge has minor impacts to water quality, and negligible effects on marine VECs, because the discharge is effectively dispersed in the mixing zone and throughout the bay. See CIRNAC-IR-8(b) for further discussion on this pathway and assessment.

The 8,000 m<sup>3</sup>/day stated above is part of the increase to 20,000 m<sup>3</sup>/day, which is an alternative to the Project. An assessment of the alternative is provided in Appendix IR-12 of this response package.



<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-5</b>
<b>Re:</b>	<b>Discharging 20,000 cmpd of groundwater effluent and surface contact water into the marine environment details and impacts.</b>		

**Recommendation Made by Interested Party:**

*A complete Final Environmental Impact Statement Addendum that addresses all aspects of the proposed project including clarification about potential alternative option of discharging 20,000 cmpd of groundwater effluent and surface contact water into the marine environment and the potential environmental and socio-economic impacts of this proposed activity.*

**Agnico Eagle's Response to Recommendation:**

Please see Appendix IR-12 of this response package for an assessment of the Project alternative to discharge 20,000 m<sup>3</sup>/day.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-6</b>
<b>Re:</b>	<b>Caribou interactions with above-ground pipelines in Alberta</b>		

**Recommendation Made by Interested Party:**

*More information about the "experience with above-ground pipelines in Alberta" with details about the environment, the caribou herd, the timing of the experience, the details of the "above-ground pipelines," etc.*

**Agnico Eagle's Response to Recommendation:**

Since the publication of the August 2020 FEIS Addendum, Agnico Eagle has conducted consultation on the waterline. In response to concerns over caribou, Agnico Eagle has committed to cover 80-90% of the waterline (Commitment #9; NIRB Public Registry ID 331287). For details on consultation and covering of the line, please refer to KivIA-IR-08.

With this cover in place, the waterline will effectively be buried in the side of the road. Caribou are expected to cross the road-waterline structure in the same way they currently cross the road.

Therefore, caribou will not be crossing the waterline alone or the waterline using caribou crossings, as discussed in the August 2020 FEIS Addendum.

Despite this, Agnico Eagle has provided a literature review of caribou and waterlines in Appendix IR-11 of this response package.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-7</b>
<b>Re:</b>	<b>Recent caribou behavioural monitoring (July 2020)</b>		

**Recommendation Made by Interested Party:**

*More information about the "recent behavioural monitoring (July 2020)" with details about the environment, the caribou herd, the timing of the experience, the details of the "above-ground pipelines," etc.*

**Agnico Eagle's Response to Recommendation:**

Since the publication of the August 2020 FEIS Addendum, Agnico Eagle has conducted consultation on the waterline. In response to concerns over caribou, Agnico Eagle has committed to cover 80-90% of the waterline (Commitment #9; NIRB Public Registry ID 331287). For details on consultation and covering of the line, please refer to KivIA-IR-08.

With this cover in place, the waterline will effectively be buried in the side of the road. Caribou are expected to cross the road-waterline structure in the same way they currently cross the road.

During 2020, Agnico Eagle updated the methods used for behaviour monitoring to follow the scan sampling guidelines produced by the Government of Northwest Territories, Department of Environment and Natural Resources (GNWT ENR). Behaviour monitoring occurred along Project roads and at the mine site. The results of this monitoring is scheduled to be included in the Meliadine 2020 TEMMP Report to the NIRB in March 2021. For details on other above ground pipelines, please refer to response provided to KivIA-IR-08 which has two attachments, ERM 2020 and Golder 2020 that provide a literature review of caribou and waterlines.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-8</b>
<b>Re:</b>	<b>ERM 2020 Report</b>		

**Recommendation Made by Interested Party:**

*The ERM 2020 Summary of Waterline and Caribou Interactions report.*

**Agnico Eagle's Response to Recommendation:**

For reference, Agnico Eagle has provided a literature review in Appendix IR-11 of this response package.

Interested Party:	KWB	Rec No.:	KWB-IR-9
Re:	Literature review of caribou and linear development		

**Recommendation Made by Interested Party:**

*The literature review of caribou and linear development, as well as all of the referenced literature.*

**Agnico Eagle's Response to Recommendation:**

For reference, Agnico Eagle has provided a literature review in Appendix IR-11 of this response package.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-10</b>
<b>Re:</b>	<b>Previous concerns about water pipes lying on the ground and their impact on caribou.</b>		

**Recommendation Made by Interested Party:**

*Information about the nature of the concerns by the Browns, including details about the water pipes including their size and location, the nature of the concern, how caribou have interacted with the pipes, and how AEM responded to the Browns' concerns.*

**Agnico Eagle's Response to Recommendation:**

Since the publication of the August 2020 FEIS Addendum, Agnico Eagle has conducted consultation on the waterline. In response to concerns over caribou, Agnico Eagle has committed to cover 80-90% of the waterline (Commitment #9; NIRB Public Registry ID 331287). For details on consultation and covering of the line, please refer to KivIA-IR-08.

With this cover in place, the waterline will effectively be buried in the side of the road. Caribou are expected to cross the road-waterline structure in the same way they currently cross the road.

See Figure KivIA-IR-9b that illustrates where the waterlines will be covered and where they will not.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-11</b>
<b>Re:</b>	<b>Noise disturbances to caribou, birds, and other terrestrial wildlife</b>		

**Recommendation Made by Interested Party:**

*That AEM provides specific details on the "equipment noise control systems" and noise monitoring along the AWAR.*

**Agnico Eagle's Response to Recommendation:**

Please see responses to GN-IR-07 in regard to equipment noise control systems.

In accordance with NIRB Project Certificate No. 006, and as described in the Noise Abatement and Monitoring Plan (Version 3; March, 2020), Agnico Eagle monitors outdoor ambient noise at the Meliadine site and AWAR. This would remain consistent for this amendment and consists of:

- Yearly monitoring programs, twice per year during construction and operations at NPOR06, NPOR08, NPOR14, NPR017, and FEIS receptors to:
  - verify that the noise emissions used in the FEIS noise assessment were reasonable, yet conservative
  - verify that the mitigation measures considered integral to the Project are incorporated as planned, and are effective

If noise monitoring confirms excessive Project associated noise levels exist, the monitoring data will be used to determine where noise abatement requires improvement.

Conclusions from the 2019 noise monitoring (Agnico Eagle 2020) include:

- No exceedances of the site's noise monitoring criterion (45 dBA, 24-h Leq) or night-time design target (40 dBA) occurred
- For NPOR005 and NPOR008, no measured values exceeded the FEIS predictions for those locations
- For both of these cases, since the exceedance was marginal (<3 dBA), occurred during a single monitoring event, and the noise monitoring criterion was not exceeded
  - NPOR006, one of two 24-h Leq measurements marginally exceeded the FEIS prediction of 39.8 dBA, at 40.2 dBA. Review of sound recordings indicated this was generally due to an elevated baseline environment (wind noise), mixed with intermittent but frequent backup alarms
  - NPOR017, one of three 24-h Leq measurements marginally exceeded the FEIS prediction of 43.4 dBA, at 45.0 dBA. This exceedance was generally caused by traffic noises and aircraft flyovers, occasionally compounded by simultaneous bird calls

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-12</b>
<b>Re:</b>	<b>Noise disturbances to caribou, birds, and other terrestrial wildlife</b>		

**Recommendation Made by Interested Party:**

*An analysis of anticipated noises and vibrations from the operation of the pipeline and their potential impacts on caribou, birds, and terrestrial wildlife.*

**Agnico Eagle's Response to Recommendation:**

Noise was assessed as in the August 2020 FEIS Addendum and is summarized herein.

The following two pathways were identified as primary pathways in the August 2020 FEIS Addendum:

- **Sensory disturbance can change the amount of different quality habitats and alter movement and behaviour**
- **Disruption or alteration of migration routes from the presence of the waterline**

The influence of noise is a part of sensory disturbance and was assessed. It states in that August 2020 FEIS Addendum that recent collar data suggest caribou spend 11 days in and around the AWAR and the existing Meliadine Mine, which equates to about 3% of the year. However, during those few days in the presence of the waterline, detectable local effects are predicted in caribou movement that may not translate to measurable demographic changes to caribou populations.

At the Project level, the magnitude of a potential effect on caribou movement and migration is considered low given the time of year caribou are present in the area, the number of days they spend in the area, and the cyclical nature of their presence. The geographic extent is local, duration is short-term to medium-term as it is anticipated that potential effects will be limited to during construction and for a short time post construction, which will be periodic in frequency, but with a high probability of occurrence.

The incremental and cumulative impacts from the proposed activities are predicted to not result in significant adverse impacts that would influence the abundance and distribution of caribou populations. The scale of impacts from all pathways, independently or combined, should therefore not be large enough to cause irreversible changes at the population level and decrease the resilience caribou.

Noise was also assessed as a minor pathway for wildlife and bird behaviour as follows:

- **Sensory disturbance from noise from human activities may alter wildlife and bird behaviour**

Human activities include the construction and operation of waterlines and the associated noise from such activities.

This pathway was previously assessed in the 2018 FEIS Addendum (Agnico Eagle 2018) for the use of trucks to transport treated effluent to the marine environment. Given the reduced truck traffic along the AWAR, as a consequence of the use of the waterline, there will be reduction in overall noise disturbance around



the AWAR. Effects from the construction of the waterlines, which will be limited in duration, were assessed based on activities associated with the proposed Project changes.

Sensory or in-air noise disturbance from activities along the AWAR are expected to be minor during construction. This conclusion is based on previous modelling undertaken to assess the effects of noise during construction of the bypass road (including associated activities at the Itivia quarry) around the community of Rankin Inlet was completed, prior to construction activities (Golder 2017, Appendix IR-13 of this response package). The results of this modelling indicated that construction noise would likely be difficult to perceive against baseline noise levels (per the FEIS; Agnico Eagle 2014) in most parts of Rankin Inlet, and would likely be noticeable during the early stages of construction in the southern parts of Rankin Inlet but at a level unlikely to be disturbing either indoors or outdoors. The noise effects associated with the construction and operation of the AWAR in the FEIS (Agnico Eagle 2014) were considered to be a minor pathway; effects during construction were determined to be similar to travel and activity along the road during peak usage. As a result, it is anticipated that noise effects associated with the waterline construction would be similar to effects associated with the road construction, except for a shorter period of time given the construction schedule of approximately 3 months. However, post-construction, noise impacts will be less than those predicted in the 2018 FEIS Addendum (Agnico Eagle 2018) due to the reduction in traffic volumes as the water trucks would no longer be in use.

The effect from the sensory disturbance that may potentially result in changes in health and mortality risk in terrestrial wildlife and birds due to collisions with infrastructure and/or disturbance are predicted to be negligible.

Vibrations were not assessed as Agnico Eagle and their consultants are not aware of any examples of vibrations from waterlines or any other type of pipeline influencing the behavior of wildlife, other than anecdotal information related to pipeline flow-induced vibration observed on steep slopes in Alaska or in subsea related to oil and gas activities (i.e. pressure pulses) or wind vibrations on small uncovered pipes (Shannon and Wilson 2013). Please see GN-IR-07 for further discussion on vibrations from waterlines.

**References:**

- Agnico Eagle. 2014. Final Environmental Impact Statement (FEIS) - Meliadine Gold Project, Nunavut from: [ftp://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/11MN034-Agnico Eagle%20MELIADINE/2-REVIEW/09-FINAL%20EIS/FEIS](ftp://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/11MN034-Agnico%20Eagle%20MELIADINE/2-REVIEW/09-FINAL%20EIS/FEIS).
- Agnico Eagle. 2018a. Agnico Eagle. 2018. Meliadine Gold Mine – Final Environmental Impact Statement Addendum, Environmental Assessment of Treated Groundwater Effluent Discharge into Marine Environment, Rankin Inlet. June 2018.
- Shannon and Wilson Inc. 2013. Arctic cold regions oil pipeline conference report. Alaska Department of Environmental Conservation Division of Spill Prevention and Response Industry Preparedness Program. Anchorage, Alaska 99501.

Interested Party:	KWB	Rec No.:	KWB-IR-13
Re:	Caribou collar data analyses		

**Recommendation Made by Interested Party:**

*AEM's analysis of caribou collar data.*

**Agnico Eagle's Response to Recommendation:**

See response to KivIA-IR-09 and KivIA-IR-11 including figures.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-14</b>
<b>Re:</b>	<b>Accidental release of groundwater saline effluent on the terrestrial environment and terrestrial wildlife.</b>		

**Recommendation Made by Interested Party:**

*That hydrogeology, groundwater quality, hydrology, fish, fish habitat, and plankton be analyzed as primary pathways by AEM.*

**Agnico Eagle's Response to Recommendation:**

Based on the current design and commitments made by Agnico Eagle, there is little impact to hydrology, fish and fish habitat and/or plankton (see responses to DFO-IR-1 and 2). Where the waterline crosses major water crossings that are supported by bridges along the AWAR (i.e. Meliadine River, Char River and Mile 5 crossings), the waterline will run directly under, and secured to the bridges, avoiding any potential disturbance to hydrology, fish or fish habitat.

For crossings over streams with minimal potential to support fish, such as those where flows are not visible and where there are no defined bed and banks, the waterline will be carefully positioned to allow for unobstructed flows during spring freshet conditions, maintaining bank integrity and vegetation. Heavy machinery will not be used within the high watermark during installation. Agnico Eagle is also committed to minimizing the size of the footprint to the extent possible, and to ensure proper sediment control, as per DFO measures to protect fish and fish habitat.

The potential risks to fish and fish habitat from the construction and operation of the waterline are expected to be very low, for example, the calculated disturbance footprint below the high watermark on watercourses with the potential to support fish is expected to be negligible in magnitude. However, Appendix IR-8 of this response package provides an effects assessment of these components as part of the assessment of covering the waterlines. CIRNAC-IR-9 discusses the impacts to these components in the event of an accident or malfunction such as a leak, spill, or sabotage of the waterline.

Hydrogeology and groundwater quality are not predicted to be impacted by the Project, which is the conveyance of groundwater as part of the treated effluent to the ocean. Rather the hydrogeology and groundwater quality are the drivers for the request for a Project amendment.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-15</b>
<b>Re:</b>	<b>Impact on foxes, ground squirrels, and the terrestrial ecosystem</b>		

**Recommendation Made by Interested Party:**

*That AEM provide an analysis on how the proposed pipelines may impact foxes.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle does not anticipate any additional effects to foxes outside of the proposed footprint of the covered waterlines that are placed immediately adjacent to the road. There may be additional use of the waterline cover by small mammals which could increase foraging opportunities for foxes. Current monitoring of the AWAR has not indicated any obvious changes regarding fox interactions with the AWAR and Agnico Eagle anticipates the same pattern with the addition of the covered waterlines.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-16</b>
<b>Re:</b>	<b>2019 Terrestrial Effects Monitoring and Mitigation Program Annual Report</b>		

**Recommendation Made by Interested Party:**

*The 2019 Terrestrial Effects Monitoring and Mitigation Program Annual Reports prepared by Golder.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle confirms the document ID number referenced in the August 2020 FEIS Addendum (NIRB Public Registry ID 329355) is the correct file for the 2019 Terrestrial Effects Monitoring and Mitigation Annual Report. Agnico Eagle refers the NWB to page 882 of the pdf file for the start of the report.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-17</b>
<b>Re:</b>	<b>Impacts on eider ducks, eider duck eggs, and traditional collecting activities.</b>		

**Recommendation Made by Interested Party:**

*Can Environment and Climate Change Canada work with local hunters on a monitoring program to ensure harvesters are not at risk.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle notes the KWB has directed this response to ECCC to address.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-18</b>
<b>Re:</b>	<b>Traditional knowledge study reports</b>		

**Recommendation Made by Interested Party:**

*That the following reports be provided to intervenors:*

*Nanuk Enterprises (Nanuk Enterprises Ltd). 1999. WMC International Ltd., Meliadine West Gold Project, Traditional Ecological Knowledge Study, Final Report. For WMC International Ltd. and Comaplex Minerals. Rankin Inlet, NU.*

*Nanuk Enterprises. 2011. Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove for Golder Associates Ltd. Meliadine Gold Project.*

**Agnico Eagle's Response to Recommendation:**

The report for Nanuk Enterprises (1999) is provided in Appendix IR-14 of the response package.

The report for Nanuk Enterprises (2011) was provided as Appendix 9.3-A of the 2014 FEIS and is available on the NIRB Public Registry (ID No. 287607).

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-19</b>
<b>Re:</b>	<b>Clarification on monitoring and violations of regulations and terms and conditions.</b>		

**Recommendation Made by Interested Party:**

*That the regulatory agencies provide specific, plain language details about their monitoring responsibilities of AEM's project proposal.*

*That the regulatory agencies provide specific, plain language details about the repercussions if AEM is out of compliance in their discharge of treated groundwater effluent.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle notes the KWB has directed this response to the NIRB, CIRNAC, and DFO to address.



<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-20</b>
<b>Re:</b>	<b>Review of the water treatment plant monitoring and reporting practices</b>		

**Recommendation Made by Interested Party:**

*That the review of the water treatment plant monitoring and reporting practices be added to the NIRB public registry.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle refers KWB to the Meliadine Project Annual Report for the monitoring results of the water treatment plant (Agnico Eagle 2020). The reporting practices are detailed in the Meliadine Water Licence 2AM-MEL 1631 and Project Certificate (No. 006). Additional details on the performance status of the water treatment plants are provided in the response to CIRNAC-IR-05.

**References:**

Agnico Eagle. 2020. Meliadine Gold Project 2019 Annual Report. April 2020.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-21</b>
<b>Re:</b>	<b>Clarification on discharge timing</b>		

**Recommendation Made by Interested Party:**

*That AEM clarifies how they define the ice-free season, when they anticipate ice-free season to occur, and how many ice-free days they have used to determine their anticipated daily discharge volumes.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle assumed 102 ice-free days and 85 days of operation of the system. These 17 days of contingency allows for maintenance and uncertainties regarding the commencement of the discharge. As detailed in the Project Certificate No. 006 Term and Condition No. 131, the commencement and ending of the open water season for marine effluent discharge will be confirmed with the HTO.

Interested Party:	KWB	Rec No.:	KWB-IR-22
Re:	Plain language summary of the chemical composition of the treated groundwater effluent		

**Recommendation Made by Interested Party:**

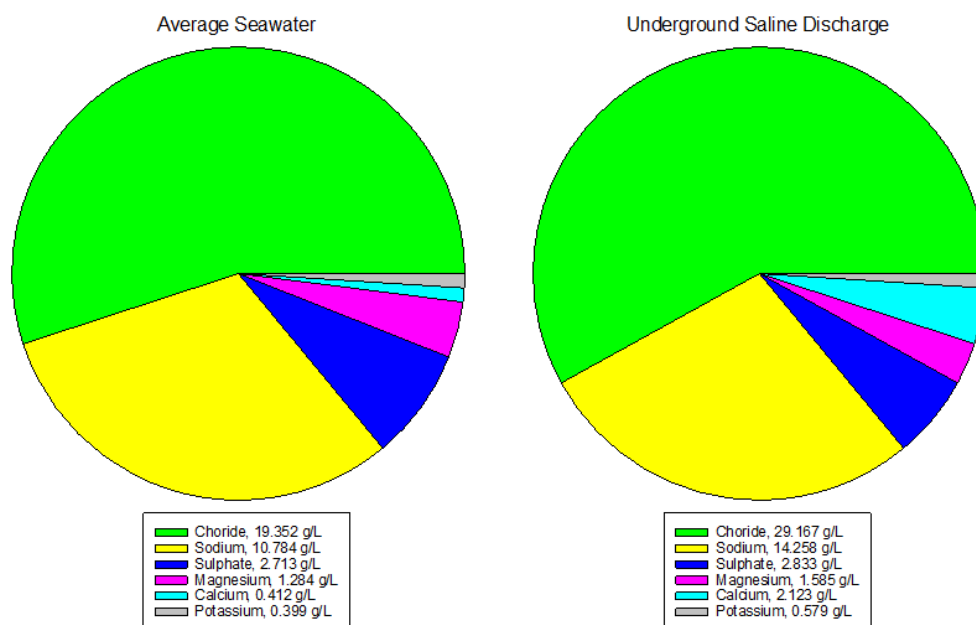
*That AEM provides a report on the chemical composition of the groundwater effluent and that a plain language summary of the report is provided.*

**Agnico Eagle's Response to Recommendation:**

Table NIRB-IR-17 in the response to NIRB-IR-17 provides the average concentration for chemical constituents in the discharge that are listed in the MDMER Schedule 4 Regulation.

The chemical composition of the groundwater was conceptualized as old seawater that has been trapped underground and released during development. A graphical comparison showing the comparison between the chemical composition of seawater and the underground discharge is shown in Figure KWB IR-22. Although the groundwater is expectedly more saline, the relative proportion of the major chemical constituents is very similar to that of seawater.

**Figure KWB-IR-22. Comparison of Chemical Composition of the Underground Discharge and Open Ocean seawater.**



Note: The relative major chemical constituent concentrations are provided in the legends.

Sources:

Seawater: Floor Anthoni, J. 2006. The Chemical Composition of Seawater. [www.seafriends.org.nz/oceano/seawater.htm](http://www.seafriends.org.nz/oceano/seawater.htm).

Underground Saline Discharge: Level 300 Sump, Tiri Underground, Monitoring data spanning June 2019 to April 2020, Agnico Eagle Mines.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-23</b>
<b>Re:</b>	<b>The proposed "in-line fibre optic leak detection system"</b>		

**Recommendation Made by Interested Party:**

*More information about the specifics of the "in-line fibre optic leak detection system" and how it would work, including the types of leaks that it will be able to detect.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle refers KWB to CIRNAC-IR-11 response for more information regarding the in-line fiber optic leak detection system.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-24</b>
<b>Re:</b>	<b>The capacity of the proposed HPDE system.</b>		

**Recommendation Made by Interested Party:**

*If the project scope includes a discharge up to 20,000 m<sup>3</sup>/day, the EIS should include an assessment about the risk of the HPDE system failing.*

**Agnico Eagle's Response to Recommendation:**

Please refer to response provided in CIRNAC-IR-3; and Appendix IR-1 of this response package.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-25</b>
<b>Re:</b>	<b>Meliadine Pipeline Construction Feasibility Report (Golder 2019c)</b>		

**Recommendation Made by Interested Party:**

*The KWB requests that AEM provide copies of "Meliadine Pipeline Construction Feasibility Report (Golder 2019c)."*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle refers the KWB to Appendix IR-15 of this response package for the requested report. As outlined in Section 3.4.6 of the August 2020 FEIS Addendum, reiterating that this was completed as a high-level evaluation of constructability options of pipe installation.

<b>Interested Party:</b>	<b>KWB</b>	<b>Rec No.:</b>	<b>KWB-IR-26</b>
<b>Re:</b>	<b>Cumulative impacts of the potential development of the Discovery project with additional mining, road, and pipeline infrastructure.</b>		

**Recommendation Made by Interested Party:**

*An analysis of how anticipated roads and pipeline construction would add to linear infrastructure on the ground around Rankin Inlet and how this could impact terrestrial wildlife (particularly caribou) and Inuit land use.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle does not anticipate in largely measurable incremental effects to the environment as a result of the waterline construction. The waterline will be covered by the same material as the AWAR, it will be of lower profile than the AWAR and consequently easier to cross for caribou and other wildlife. Inuit will be able to cross the waterlines the same way that they currently cross the AWAR. The TEMMP outlines monitoring programs that helps Agnico Eagle to understand the effects of the Meliadine Project and the AWAR on wildlife, and from this monitoring work we can understand if adaptive management will be necessary or not.

## **NUNAVUT IMPACT REVIEW BOARD (NIRB)**



<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-1-August27</b>
<b>Re:</b>	<b>Melvin Bay Effluent Discharge Rate Alternative</b>		

**Recommendation Made by Interested Party:**

*The NIRB notes that the revised IS Addendum describes the option to discharge up to a maximum of 20,000 m<sup>3</sup> per day of surface contact water, and that the proposed project infrastructure has been designed to accommodate this alternative, if necessary in the future. The Board notes that the Proponent has completed dispersion modelling with respect to the 20,000 m<sup>3</sup> per day discharge volume, however the revised IS Addendum also states that “Agnico Eagle has not completed a full environmental and socio-economic assessment of this alternative”. The Board therefore expects that the Proponent will submit an assessment of the anticipated ecosystemic and socio-economic impacts of this alternative, in accordance with s. 101(3)(g) of NuPPAA, as part of its’ IR Response Package.*

**Agnico Eagle’s Response to Recommendation:**

Please see Appendix IR-12 of this response package, for the assessment of 20,000 m<sup>3</sup>/day.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-2-August27</b>
<b>Re:</b>	<b>Treatment of increased volume of saline effluent</b>		

**Recommendation Made by Interested Party:**

*The NIRB also notes that the scope of the previously assessed 2018 Saline Effluent Discharge Project included the “treatment of saline groundwater, as necessary, to ensure it meets criteria for discharge into the marine environment”, however in the context of an expected maximum discharge volume of 800 m<sup>3</sup> per day.<sup>5</sup> As the volume of the proposed discharge under the current project proposal is considerably higher in scale than what was previously assessed, the Board expects that the associated treatment process would require to be scaled up appropriately in order to accommodate the treatment of the higher volume of saline effluent over the life of mine. The Board expects that additional information on the treatment of the proposed discharge volumes will be provided as part of the Proponent’s IR Response Package, in order to provide certainty that the currently approved process will be able to treat the volumes of saline effluent proposed to a level that continues to meet regulated discharge guidelines and criteria.*

**Agnico Eagle’s Response to Recommendation:**

The following section presents an overview of the water treatment plant used to feed the waterline. Selection of equipment and design information will be submitted to the NWB through a design report in the appropriate time before construction.

The parameters of concern identified in water to be treated are: Ammonia and Total Suspended Solids (TSS). The treatment plant will be designed to meet the MDMER effluent criteria.

The water treatment plant will include the following units:

- A TSS removal unit:
  - o a typical coagulation, flocculation, clarification process will be used for this step (e.g. with sand ballasted high rate clarifiers).
- An ammonia removal unit:
  - o e.g. break point chlorination.

The main steps in ammonia removal using break point chlorination process are the following:

- reaction of hypochlorite with ammonia to form nitrogen,
- removal of hypochlorite solution in excess with activated carbon and quenching solution (to gain more reliability on the chlorine removal).

The main steps of the TSS removal are:

- An in situ flocculation system used underground prior to pump water at the surface for bulk TSS removal,
- The natural settling of sediment within the saline storage area (e.g. Saline ponds),

- TSS removal in a sand ballasted clarifier,
- A polishing filtration if required.

The treatment selected will be designed to reach 12,000 m<sup>3</sup>/day to a maximum rate of 20,000 m<sup>3</sup>/day, in the event this alternative is required. Clarifier Unit for TSS removal used for that flow are common in water treatment process. The equipment used for ammonia removal consist mainly of vessels having a sufficient contact time for the flow rates requested in the application and the alternative scenario, if required. The dosing skid will be selected to provide a chemical flow proportional to the feed flow and the ammonia concentration.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-001</b>
<b>Re:</b>	<b>Public engagement</b>		

**Recommendation Made by Interested Party:**

*Clarify how the community concerns, including as described in the subsequent consultation reports, indicate neutrality.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle's definition of neutrality regarding questions and comments during the consultation process is whether the person is demonstrating satisfaction/in satisfaction or not (neutrality). Neutrality typically defined questions or comments that had no positive or negative connotation to them and did not indicate whether individuals were in favor or not in favor of the waterline. See below some examples of questions/comment that we qualify as neutral.

<b>Question/Comment</b>
Will there be a public consultation?
Agnico should work with the KIA and HTO on caribou crossings, <b>Agnico will need to use a material (crushed rock) that animals will be able to walk over.</b>
Can the evaporator be used instead of the waterline?

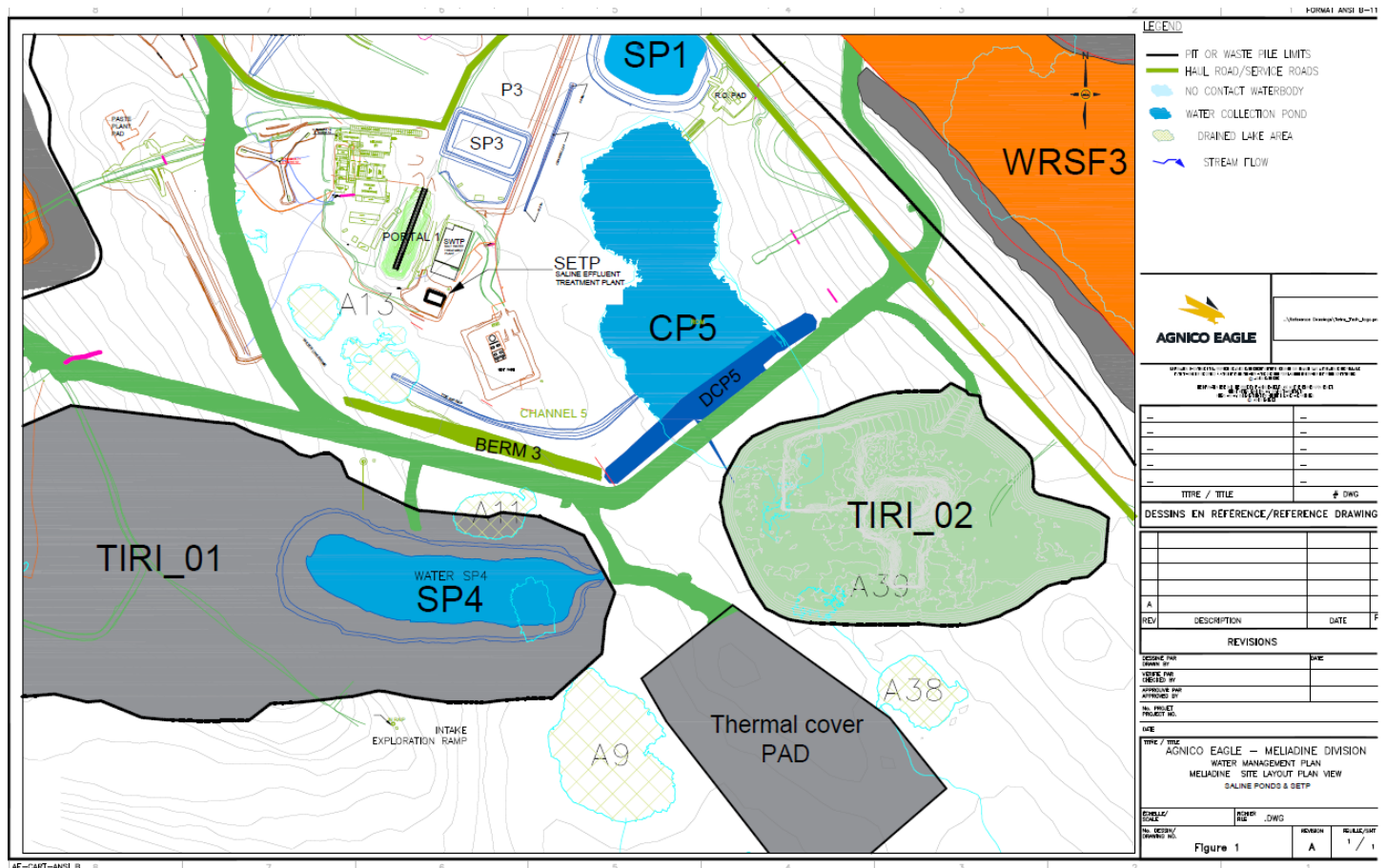
Interested Party:	NIRB	Rec No.:	NIRB-IR-002
Re:	On-site storage for saline effluent		

**Recommendation Made by Interested Party:**

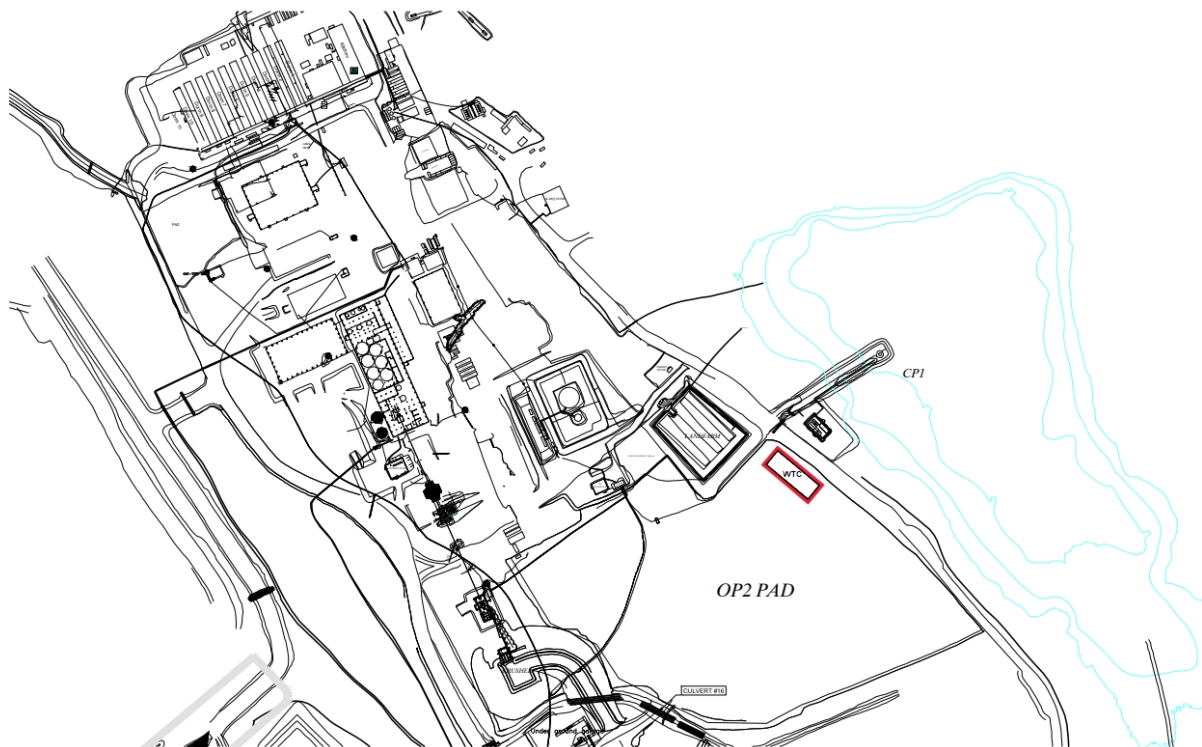
*Provide an updated figure that includes the locations of the saline storage ponds and the Saline Effluent Treatment Plant.*

**Agnico Eagle's Response to Recommendation:**

The locations of the surface storage ponds for saline effluent, as well as the current location of the Saline Effluent Treatment Plant (SETP) are shown in the figure below.



Agnico Eagle plans to relocate the SETP and EWTP in the Water Treatment Complex (WTC) as presented in the approved by NWB Design Report Building for Water Treatment Complex (WTC) (Agnico Eagle 2020). The figure below presents future location of the WTC.



<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-003</b>
<b>Re:</b>	<b>Waterline burial</b>		

**Recommendation Made by Interested Party:**

*Provide a cross-section, drawing or diagram depicting how the waterlines will be buried next to the existing road, including height, typical slope and depth of coverage with description of material grade to be used.*

**Agnico Eagle's Response to Recommendation:**

Please refer to response provided in CIRNAC-IR-13, Part C.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-004</b>
<b>Re:</b>	<b>Waterline installation</b>		

**Recommendation Made by Interested Party:**

*Provide a cross-section, drawing, or diagram depicting how the waterlines will be buried next to the existing road, including typical slope and depth of coverage.*

**Agnico Eagle's Response to Recommendation:**

Please refer to response provided in CIRNAC-IR-13, Part C.



Interested Party:	NIRB	Rec No.:	NIRB-IR-005
Re:	Greenhouse gas emission calculations		

### Recommendation Made by Interested Party:

*Provide a discussion of the factors contributing to greenhouse gas emissions for the preferred scenario. Include detailed calculations of greenhouse gas emissions which allowed the Proponent to arrive at the conclusion that there would be a reduction over the other scenarios as indicated in Table 4. Provide the air emission calculations to show how the Proponent arrived at the conclusion of net reduction for the proposed activities.*

### Agnico Eagle's Response to Recommendation:

The greenhouse gas emissions calculation were based on emission rate presented in the Appendix IR-16 of this response package and table below is presenting the detailed calculation for the scenario indicated in Table 4 of the August 2020 FEIS Addendum.

Item	Description		
1	<b>Waterline Conveyance GHG Emission</b>	<b>Scenarios</b>	
	Waterline Volumes	6,000	12,000
	Daily Emission	1	2
	Number of Days	101	101
	Yearly Emission	101	202
	<b>Total</b>	<b>101</b>	<b>202</b>
2	<b>Approved Trucking GHG Emission</b>	<b>Scenarios</b>	
	<u>Approved Trucking (Round trips)</u>	20	40
	Daily Emission	13	25
	Number of Days	101	101
	Yearly Emission	1,313	2,525
	<u>Approved Salt Maker Treatment Units</u>	2	4
	Daily Emission	62	123
	Number of Days	365	365
	Yearly Emission	22,448	44,895
	<b>Total</b>	<b>23,761</b>	<b>47,420</b>
3	<b>Trucking Waterline Volume</b>	<b>Scenarios</b>	
	<u>Approved Trucking (Round trips)</u>	150	300
	Daily Emission	94	188
	Number of Days	101	101
	Yearly Emission	9,494	18,988
	<u>Approved Salt Maker Treatment Units</u>	27	54
	Daily Emission	922	1843
	Number of Days	365	365
	Yearly Emission	336,530	672,695
	<b>Total</b>	<b>346,024</b>	<b>691,683</b>
4	<b>Potential GHG Emission Reduction</b>	<b>345,923</b>	<b>691,481</b>

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-006</b>
<b>Re:</b>	<b>Community consultation opportunities</b>		

**Recommendation Made by Interested Party:**

*Clarify how Agnico Eagle considers community meetings and meetings with regulators as part of public engagement specific to the current project proposal, considering that the 2018 Saline Effluent Discharge Project was not approved to proceed prior to February 2019.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle recognizes that Project-specific consultation is required; however, to avoid consultation fatigue Agnico Eagle has taken the approach to have consultation and engagement sessions that address multiple aspects of the Meliadine Mine. Any concerns brought up during those discussions that could be relevant or applicable to other aspects of the Meliadine Mine. Comments and concerns related to Melvin Bay are relevant to decisions made for this FEIS amendment, including construction methods, concerns around water quality in Meliadine Lake (and additional discharges) and continuing with an ice-free discharge. Meetings with the HTO that highlighted their key concerns such as air quality and dust, water quality, and fish lead to decision making. For example, moving to a waterline rather than increasing truck traffic and dust was a key driver in the decision to pursue a waterline.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-007</b>
<b>Re:</b>	<b>Commitments resulting from community consultations</b>		

**Recommendation Made by Interested Party:**

*The Proponent should provide an updated list of commitments resulting from community consultation to date, which clarifies the project design. Recognizing that public engagement may still be ongoing, the Proponent should continue to track the commitments made regarding community concerns and provide updates to the NIRB and parties as they become available.*

**Agnico Eagle's Response to Recommendation:**

The nine commitments listed in the Appendix 1 of the Waterline Consultation Report dated August 28, 2020 (NIRB Public Registry ID 331287), are still accurate and unchanged following the public engagements that have occurred up to October 9, 2020. If additional commitments are made by Agnico Eagle, the updated list will be communicated to the NIRB and concerned parties.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-008</b>
<b>Re:</b>	<b>Freshwater environment background</b>		

**Recommendation Made by Interested Party:**

*Provide freshwater environment background where applicable as the proposed waterline may be located near freshwater bodies or over rivers.*

**Agnico Eagle's Response to Recommendation:**

Freshwater environment (e.g., fish and fish habitat, freshwater quality) were not consider a VEC as no additional effects are expected with the small-scale proposed Project activities than what was assessed in the FEIS (Agnico Eagle 2014) as all activities are within the approved lease area of the AWAR and bypass road. However please see Appendix IR-8 and DFO-IR1 and 2 for additional information related to freshwater bodies and water crossings.

Baseline studies, which included freshwater crossings, have been completed along the AWAR, which encompasses the area of the waterline location. The AWAR corridor and area on either side of the AWAR were assessed in both the Phase 1 Meliadine All-weather Access Road Project Description and Environmental Assessment (Golder 2011) and the 2014 FEIS (Agnico Eagle 2014).

Key findings from the Aquatic Synthesis Report (Golder 2012) as provided in the 2014 FEIS Supporting Document 7-1 (full report is provided on the NIRB Public Registry, ID Nos 287577 to 287589), and the 2014 FEIS Volume 7 (Agnico Eagle 2014) include the following:

- Assessments of fish and fish habitat were conducted at 10 watercourse crossings located along the AWAR. Stream crossings surveyed were assigned a unique designation that included a corridor prefix (M for Meliadine West area) followed by the distance (in kilometres) along the road alignment from south to north.
- Within the Meliadine West road corridor, Site M2.1 (Meliadine River) was of particular importance. The presence of deep run and pool areas indicated high quality habitat for various life-stages of fish species known to inhabit the river. Other noteworthy watercourses within the Meliadine West road corridor include Site M23.7, where slimy sculpin were captured, and habitat quality for rearing and migration were rated as moderate to high.
- Sites M5.0, M11.5, and M22.6 also featured suitable rearing habitat for Arctic grayling. Although not confirmed by egg sampling, Sites M5.0 and M11.5 are likely used by Arctic grayling for spawning based on the availability of suitable habitat and/or the presence of Arctic grayling juveniles in the catch. In contrast, Sites M3.0, M3.9, M6.7, M8.6, and M13.3 had relatively poor fish habitat potential, as evidenced by a lack of fish captures and only 12 observed fish (ninespine stickleback) at Sites M3.0 and M13.3. Shallow depths, dry channels (e.g., Site M6.7), poor spawning substrates (detritus), and a lack of instream cover contributed to poor habitat ratings.
- Crossing assessments were performed from 16 to 25 June 2008. During the 2008 visit, the area was free of snow, but ice was present along the margins of some of the watercourses investigated,

especially the Meliadine River. Most meltwater had drained from the study area; however, standing water was observed along stream margins.

- The AWAR crosses the Meliadine River near its mouth (site M2.1), and 9 shallow ephemeral watercourses (sites M3.0, M3.9, M5.0, M6.7, M8.6, M11.5, M13.3, M22.6, and M23.7). With the exception of the Meliadine River, the majority of the watercourses to be crossed by the proposed roads are small, ephemeral streams, often flowing through poorly defined channels. The watercourses were comprised primarily of shallow-water habitats with occasional riffles and pools with moderate depth. Habitat potential for fish was typically poor to moderate and use by fish is seasonal. However, habitat at some of the larger watercourses with perennial flow, such as the Meliadine River, had higher potential to support fish populations for longer periods of time.

**All-weather Access Road- Meliadine Corridor**

- Excluding the Meliadine River crossing, mean channel widths for streams along the Meliadine Road corridor ranged from 2.1 to 9.0 m and mean depths were shallow ranging from 0.1 to 0.2 m; maximum depths did not exceed 0.6 m. A variety of channel types were encountered including single, double, multiple, and braided, as well as areas of dispersed flow (i.e., without a well-defined stream channel). Generally, individual reaches consisted of more than one channel type with braided and dispersed channels as the most common types observed.
- Instream cover for fish was available in a variety of forms and was abundant in each of the streams surveyed. Given the semi-flooded conditions, aquatic and terrestrial plants provided the majority of cover ranging in proportion from 5 to 100% within individual reaches. Undercut banks were observed in small portions in 4 of the streams sampled. Boulder gardens provided additional cover for fish, but considerably less than vegetation. Given the small size of the watercourses, instream cover mainly provided habitat for small-bodied fish, such as ninespine stickleback and juvenile Arctic grayling. Within the sampled section of the Meliadine River, the river was confined to a single channel with a few small rock piles scattered throughout. Wetted widths ranged from 34 to 134 m and the flooded width of the river ranged from 58 to over 200 m. At the time of visit, flows precluded safe measurement of depth; however, depths were greater than 1.5 m along the periphery. Instream habitat consisted primarily of runs, with riffles and pools also present. Substrate and instream habitat were difficult to gauge because the river was turbid; however, bankside estimates suggested that substrates were dominated by boulder and cobble with gravel and fines present to lesser degrees.

Key finding from the Phase 1 Meliadine All-weather Access Road Project Description and Environmental Assessment (Golder 2011) include:

- Section 3.1.3: Due to the poor quality fish habitat documented at most crossings during these surveys and that the crossing structures (bridges and culverts) would represent low risk to the fish populations, Fisheries and Oceans Canada (DFO) have subsequently advised AEM that the road is unlikely to result in impacts on fish and fish habitat if the operational statement for Clear Span Bridges is followed. Clear span bridges are in place at the Char River, Meliadine River, and M5.

**References:**

Agnico Eagle. 2014. Final Environmental Impact Statement (FEIS) - Meliadine Gold Project, Nunavut from:  
[ftp://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/11MN034-Agnico Eagle%20MELIADINE/2-REVIEW/09-FINAL%20EIS/FEIS](ftp://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/11MN034-Agnico%20Eagle%20MELIADINE/2-REVIEW/09-FINAL%20EIS/FEIS).

Golder (Golder Associates Ltd.). 2011. Phase 1 – Meliadine All-weather Access Road Project Description and Environmental Assessment. September 2011. Ref No. 1013730076-241.

Golder. 2012. Final Report SD 7-1 Aquatics Baseline Synthesis Report, 1994 to 2009 – Meliadine Golder Project, Nunavut. October 2012. Ref No. 1013730076-327

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-009</b>
<b>Re:</b>	<b>Transboundary effects</b>		

**Recommendation Made by Interested Party:**

*Provide further clarification on whether transboundary effects should be considered.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle followed the approach to transboundary effects that was accepted by the NIRB in relation to the 2015 review as well as the 2018 reconsideration. Further, impacts along the AWAR to wildlife were previously assessed and the addition of a waterline buried in the shoulder of the road does not present any additional impacts to caribou. Appendix IR-8 provides an assessment of covering the waterlines.

There are no effects from the Project beyond those predicted in the FEIS (Agnico Eagle 2014) and the 2018 FEIS Addendum (Agnico Eagle 2018) or the 2020 FEIS Addendum (Agnico Eagle 2020) that occur outside the Regional Study Area that are linked to the Project. The implementation of environmental design features and wildlife management practices are expected to result in negligible changes to the mortality rate from physical hazards, relative to baseline conditions, and limited impacts from sensory disturbance due to the short construction period for the waterline and the placement of covers. As stated in the 2020 FEIS Addendum, while some individuals from the Qamanirjuaq herd will be affected, the herd is not anticipated to be affected annually due to the cyclical nature of caribou and the time spent in the RSA. The incremental and cumulative impacts from the Project are predicted to not significantly influence the maintenance of wildlife populations, particularly caribou and the continued opportunity for traditional and non-traditional use. For all of these reasons, Agnico Eagle is of the view that no further consideration of transboundary effects is required.

**References:**

Agnico Eagle. 2014. Final Environmental Impact Statement (FEIS) - Meliadine Gold Project, Nunavut from: [ftp://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/11MN034-Agnico Eagle%20MELIADINE/2-REVIEW/09-FINAL%20EIS/FEIS](ftp://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/11MN034-Agnico%20Eagle%20MELIADINE/2-REVIEW/09-FINAL%20EIS/FEIS).

Agnico Eagle. 2018. Meliadine Gold Mine – Final Environmental Impact Statement Addendum, Environmental Assessment of Treated Groundwater Effluent Discharge into Marine Environment, Rankin Inlet. June 2018.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-010</b>
<b>Re:</b>	<b>Employment reduction</b>		

**Recommendation Made by Interested Party:**

*Provide change in employment numbers that are anticipated to result from the proposed project implementation (i.e. through reduction of truck drivers).*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle refers NIRB to response provided to CIRNAC-IR-14.



<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-011</b>
<b>Re:</b>	<b>Impacts to caribou</b>		

**Recommendation Made by Interested Party:**

*The IS Addendum states "Impacts along the AWAR to wildlife were previously assessed and activities associated with waterlines are less than those for roads."*

*Provide evidence and references to support this conclusion.*

**Agnico Eagle's Response to Recommendation:**

In the FEIS for the Meliadine Mine a footprint was identified that assessed both direct impacts from the physical footprint of the AWAR and indirect impacts from the AWAR. These impacts exist and do not change with or without the waterline, because the waterline is to be placed within the easement of the road. There is no additional impact from laying a waterline along side the AWAR than what has been assessed from the footprint to wildlife. There are no effects from the Project beyond those predicted in the FEIS (Agnico Eagle 2014) and the 2018 FEIS Addendum (Agnico Eagle 2018). For example, habitat loss from direct or indirect disturbance, the Project component is not the driver, it is the total area of loss, whether it be the AWAR or the waterline. The total amount of direct and indirect habitat loss does not change. This habitat was assumed to be lost in the original FEIS and is still considered lost. Therefore, to account for it as a new impact from the waterline would be in essence "double-counting". Impacts that incrementally or cumulatively impact caribou are assessed.

The FEIS (Agnico Eagle 2014) evaluated potential effects of the Project on caribou at the mine site and AWAR. The FEIS (Agnico Eagle 2014) also evaluated the potential for disruption of movement for caribou across the AWAR. As part of the August 2020 FEIS Addendum, Agnico Eagle evaluated if the addition of the waterline would increase the potential effects of habitat loss or disruption of movement and concluded that there would be no increase in these effects to the waterline from habitat loss but some sensory disturbance due to construction (also see Appendix IR-8 for additional sensory disturbance from the covers).

Since the publication of the August 2020 FEIS Addendum, Agnico Eagle has conducted consultation on the waterline. In response to concerns over caribou, Agnico Eagle has committed to cover 80-90% of the waterline (Commitment #9; NIRB Public Registry ID 331287). For details on consultation and covering of the line, please refer to KivIA-IR-08.

With this cover in place, the waterline will effectively be buried in the side of the road. Caribou are expected to cross the road-waterline structure in the same way they currently cross the road. Therefore, no additional habitat loss or disruption of movement is expected due to the waterline beyond that already predicted due to the AWAR in the FEIS (Agnico Eagle 2014) and approved by the NIRB.

**References:**

Agnico Eagle. 2014. Final Environmental Impact Statement (FEIS) - Meliadine Gold Project, Nunavut from:  
[ftp://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/11MN034-Agnico Eagle%20MELIADINE/2-REVIEW/09-FINAL%20EIS/FEIS](ftp://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/11MN034-Agnico%20Eagle%20MELIADINE/2-REVIEW/09-FINAL%20EIS/FEIS).

Agnico Eagle. 2018. Meliadine Gold Mine – Final Environmental Impact Statement Addendum, Environmental Assessment of Treated Groundwater Effluent Discharge into Marine Environment, Rankin Inlet. June 2018.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-012</b>
<b>Re:</b>	<b>Sensory disturbance from noise</b>		

**Recommendation Made by Interested Party:**

*Provide the current and projected truck traffic along the AWAR and resulting changes expected for noise (i.e. decibels) associated with use of the waterline.*

**Agnico Eagle's Response to Recommendation:**

As reported in the Meliadine 2019 Annual Report (Agnico Eagle 2020) the traffic observed on the AWAR in 2019 (e.g., current) are:

<b>Month</b>	<b>Total Traffic</b>	<b>Average Trips Per Day 2019 (800 m<sup>3</sup>/day)</b>	<b>Projected Traffic at 1,600 m<sup>3</sup>/day<sup>(a)</sup></b>	<b>Project Traffic following Waterline Operations<sup>(b)</sup></b>
January	1076	35	35	35
February	1028	37	37	37
March	1202	39	39	39
April	1333	44	44	44
May	1333	43	43	43
June	1530	51	77	51
July	2177	70	114	70
August	3014	97	125	81
September	2980	99	127	83
October	2523	81	120	76
November	1412	47	47	47
December	1169	38	38	38

a) 1,600 m<sup>3</sup>/day based on approval from the NIRB re: July 9, 2020 Nunavut Impact Review Board Direction Regarding the "2020 Saline Discharge Strategy"

b) This is based on approval in July 2021 and the waterline operational in 2022. Trucking will continue in 2021 and possibly in 2022 in the range of 1600 m<sup>3</sup>/day.

Per the 2018 FEIS Addendum (Agnico Eagle 2018), a maximum of 16 round trips by truck per day during the open water months to transport the groundwater effluent to Melvin Bay was assumed.

Operation of the waterlines project will eliminate the need for water trucks to travel up and down the AWAR and therefore reduce overall traffic volumes on the AWAR. The reduction in traffic volumes because of the waterlines project is expected to be 16 round trips per day for a discharge rate of 800 m<sup>3</sup>/day and 44 round trips per day for a discharge rate of 1,600 m<sup>3</sup>/day. The traffic reductions will occur primarily during the months from June to October (i.e., ice-free season).

The relative noise reduction that results from eliminating water truck traffic will vary based on month. September currently has the greatest traffic volumes (i.e., 99 trips per day for the current discharge rate of 800 m<sup>3</sup>/day and 127 trips per day for the projected discharge rate of 1,600 m<sup>3</sup>/day). During September, operation of the Project is predicted to reduce noise from the AWAR by 0.8 A-weighted decibels (dBA) compared to existing noise levels associated with the current discharge rate and by 1.8 dBA compared to noise levels associated with the projected discharge rate. August and September have similar traffic numbers so the results would be almost equivalent in those months. When traffic is lower in July, the reduction in noise levels is 2.1 dBA for a discharge rate of 1,600 m<sup>3</sup>/day.

**References:**

Agnico Eagle (Agnico Eagle Mines Limited). 2018. Meliadine Gold Mine – Final Environmental Impact Statement Addendum, Environmental Assessment of Treated Groundwater Effluent Discharge into Marine Environment, Rankin Inlet. June 2018.

Agnico Eagle. 2020. Meliadine Gold Project, 2019 Annual Report.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-013</b>
<b>Re:</b>	<b>Accidental release of groundwater to marine environment</b>		

**Recommendation Made by Interested Party:**

*Clarify if the in-line fibre optic leak detection system proposed would be installed along the marine discharge pipe in addition to the overland waterlines.*

**Agnico Eagle's Response to Recommendation:**

The optic fiber will be installed along the overland and buried pipe and ends at the junction with the marine discharge pipe located in Itivia.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-014</b>
<b>Re:</b>	<b>Accidental release of groundwater to marine environment</b>		

**Recommendation Made by Interested Party:**

*The Proponent should provide a discussion of the potential risk that the underground portion of the marine discharge pipe could malfunction/crack causing accidental release/seepage of saline effluent to the substrate/marine environment. If the Proponent determines that there is a risk, information should be provided within the spill management plan that outlines spill and corrective response actions.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle refers NIRB to CIRNAC-IR-9 response.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-015</b>
<b>Re:</b>	<b>TEMMP Conservatism</b>		

**Recommendation Made by Interested Party:**

*Clarify the statement regarding the conservatism of the current TEMMP, and provide comparisons with management plans from other operations to show the accuracy of the statement.*

**Agnico Eagle's Response to Recommendation:**

The intent of the statement is to highlight the conservative nature of the mitigation actions. The TEMMP outlines methods to acquire and understand caribou distribution and abundance data as they near the Meliadine Mine, including the AWAR. Given that caribou may occur in the area during the post-calving period, they typically occur in very large aggregations, numbering in the thousands. Because of the nature of caribou movements (i.e., intense but rapid), the caribou alert status results, for the most part, in a site wide shutdown including all or portions of the AWAR. This means that there are really only two states for the Mine and roads: 1) there are thousands of caribou on site and both Mine and roads are closed, or 2) there are no caribou on site and both Mine and roads are open.

Consequently, the TEMMP is highly conservative in that when caribou are on site, most operations are "off" and when the caribou leave the site, the operations are back "on" largely creating an on/off mitigation system without much room for mitigation and management in between. It should also be pointed out that caribou only interact with the project for approximately 11 days per year, largely in early to mid-July.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-016</b>
<b>Re:</b>	<b>Geotechnical hazards</b>		

**Recommendation Made by Interested Party:**

*Provide a discussion on the impacts of potential hazards to the waterline that could contribute to the long-term performance of the materials.*

**Agnico Eagle's Response to Recommendation:**

As the waterline will be operated during the summer months, the potential risk of permafrost degradation degrading the permafrost is negligible during construction and operations. As noted in CIRNAC-IR-10, an assessment of spills or leaks will be provided as part of the technical responses. The granulated cover atop the waterlines mitigates degradation of the permafrost within the foundation acting as insulation.

Even with ponded water against the AWAR at certain areas, no degradation or subsidence of the AWAR has been noted since it was built (over 5 years ago).

We have a surface 16 inch diameter HDPE pipe about 4 km long at the Mine site (discharge to Meliadine Lake) which flows typically end May to early October in operation over the last 3 years with no signs of degradation to the tundra nor signs of distress to the pipe itself.



<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-017</b>
<b>Re:</b>	<b>Effluent constituents</b>		

**Recommendation Made by Interested Party:**

*Provide a list of all effluent constituents considered and required concentrations found in the guidelines.*

**Agnico Eagle's Response to Recommendation:**

Detailed chemical analysis of the treated effluent to be discharged in Melvin Bay was undertaken during Summer 2019. Table NIRB-IR-17 below presents the average concentration of chemical constituent that will be expected in the discharge for all constituents listed in the MDMER Schedule 4 Regulation. The last column in the table indicates the dilution required to meet the most stringent regulation/guideline.

As one can observe, all listed constituents are already below MDMER regulated concentrations prior to discharge.

In addition to MDMER values, a potential maximum change of +/- 10% in ambient chloride concentration at the edge of the mixing zone led to establishing a conservative dilution target of 11:1 for the proposed amendment. The three-dimensional hydrodynamic modelling conducted to characterize the fate and behavior of the discharged effluent showed that the discharge will be fully effectively dispersed well within the mixing zone such that the 11:1 dilution target was met all the times at the edge of the mixing zone.

**Table NIRB-IR-17: Expected Chemical composition of Treated Effluent Discharge**

		<b>Effluent Concentration<sup>1</sup></b>	<b>MDMER Regulation<sup>2</sup></b>	<b>Required Dilution</b>
Cyanide (free)	mg/L	0.0099	1.0	In compliance
Arsenic	mg/L	0.0154	0.5	In compliance
Copper	mg/L	0.0084	0.3	In compliance
Lead	mg/L	0.0027	0.2	In compliance
Nickel	mg/L	0.0430	0.5	In compliance
Zinc	mg/L	0.1500	0.5	In compliance
Radium 226	Bq/L	0.1383	0.37	In compliance

<sup>1</sup> based on average concentration from 11 samples collected between July and October 2019

<sup>2</sup> provided by Metal and Diamond Mining Effluent Regulations (SOR/2002-222) – Schedule 4 Authorized Limits of Deleterious Substances

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-018</b>
<b>Re:</b>	<b>Winter temperature</b>		

**Recommendation Made by Interested Party:**

*Discuss whether winter discharge is being considered as an alternative.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle considered that the winter discharge should be an alternative as part of this application.

The potential of extending the discharge period would be possible especially during the spring when the air temperature is getting warmer and the risk of freezing the effluent within the waterline is minimal. This would allow additional volume of water to be discharged if that event did occur. This could be evaluated further and be part of an adaptive management threshold and mitigation. However, as the pipe is not planned to be insulated and heat traced, discharge during the colder months of the year would not be feasible.

In addition, the proposed diffuser was designed to minimize risk of impacting the ice cover thickness over the Melvin Bay as presented in the Meliadine Mine Bay Diffuser Conceptual Design – Effluent Near Field Modeling (Appendix IR-9 of this response package).

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-019</b>
<b>Re:</b>	<b>Effluent conditions of groundwater and contact water alternative</b>		

**Recommendation Made by Interested Party:**

*Provide an analysis of effluent conditions and dilution requirements for addition of discharge 8,000 m<sup>3</sup>/day of surface contact water*

**Agnico Eagle's Response to Recommendation:**

The application focuses on an increase of the treated effluent discharge to Melvin Bay ranging between 6,000 to 12,000 m<sup>3</sup>/day, with a contingency rate maximum of 20,000 m<sup>3</sup>/day. While the potential to release up to 8,000 m<sup>3</sup>/day of surface contact water effluent could be an alternative consideration at a later date, the composition of the discharge for the 6,000 to 12,000 m<sup>3</sup>/day represents the most realistic scenario, as explained below.

Table NIRB-IR-19 presents a comparison between expected surface contact water effluent concentrations (based on measured data collected from the EWTP as the raw feed from CP1 between 2018 and 2020) and saline effluent concentrations (based on measured data collected during 2019) for the constituents listed in the MDMER Schedule 4 Regulation.

As one can observe, all constituent concentrations are higher in the saline effluent and therefore a more conservative scenario from an assessment perspective.

The consideration of a 20,000 m<sup>3</sup>/day discharge of treated effluent requires a minimum dilution of 11:1 at the edge of the mixing zone, as explained in NIRB-IR-017. The modelling indicated effective dispersion at the edge of the mixing zone, confirming that a discharge of a mix of groundwater/surface contact water will also comply as less dilution will be required within the mixing zone than what is currently proposed.

Table NIRB-IR-19: Surface Water / Groundwater Discharge Properties

Constituents		MDMER Regulation Concentration <sup>1</sup>	Surface Contact Water Effluent Concentration	Compliance Status	Saline Effluent Concentration <sup>3</sup>	Compliance Status
Total Dissolved Solids	mg/L	-	3,500 <sup>4</sup>	-	39,000	-
Cyanide (free)	mg/L	1.0	0.0021 <sup>2</sup>	In compliance	0.0099	In compliance
Arsenic	mg/L	0.5	0.0077 <sup>2</sup>	In compliance	0.0154	In compliance
Copper	mg/L	0.3	0.0028 <sup>2</sup>	In compliance	0.0084	In compliance
Lead	mg/L	0.2	0.0008 <sup>2</sup>	In compliance	0.0027	In compliance
Nickel	mg/L	0.5	0.0066 <sup>2</sup>	In compliance	0.0430	In compliance
Zinc	mg/L	0.5	0.0615 <sup>2</sup>	In compliance	0.1500	In compliance
Radium 226	Bq/L	0.37	0.0062 <sup>2</sup>	In compliance	0.1383	In compliance

<sup>1</sup> based on Metal and Diamond Mining Effluent Regulations (SOR/2002-222) – Schedule 4 Authorized Limits of Deleterious Substances

<sup>2</sup> based on average concentrations from 21 samples collected in Summer 2018, Summer 2019 and Summer 2020

<sup>3</sup> based on average concentration from 11 samples collected between July and October 2019

<sup>4</sup> based on Meliadine water license application

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-020</b>
<b>Re:</b>	<b>Updated storage capacity table</b>		

**Recommendation Made by Interested Party:**

*If Saline Pond 2 has been decommissioned provide updated storage capacity.*

**Agnico Eagle's Response to Recommendation:**

SP2 was decommissioned in March 2020. SP4 is used in its place. The updated saline water capacity over the life of mine is shown in the response for KivIA-IR-07.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-021</b>
<b>Re:</b>	<b>Usage of Tiriganiaq Pit 2 as an alternative for saline water storage</b>		

**Recommendation Made by Interested Party:**

*Provide amount of volume use of Tiriganiaq pit 2 provides and length of time this response would be viable for.*

**Agnico Eagle's Response to Recommendation:**

Tiriganiaq Pit 2 is available for saline storage at the end of winter 2021, with an available capacity of 1,152,852 m<sup>3</sup>. This volume is available.

Interested Party:	NIRB	Rec No.:	NIRB-IR-022
Re:	Capacity of the Saline Water Treatment Plant (SWTP)		

**Recommendation Made by Interested Party:**

*Provide discussion on whether improvement of the SWTP efficiency is expected.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle refers NIRB to CIRNAC-IR-2 response.

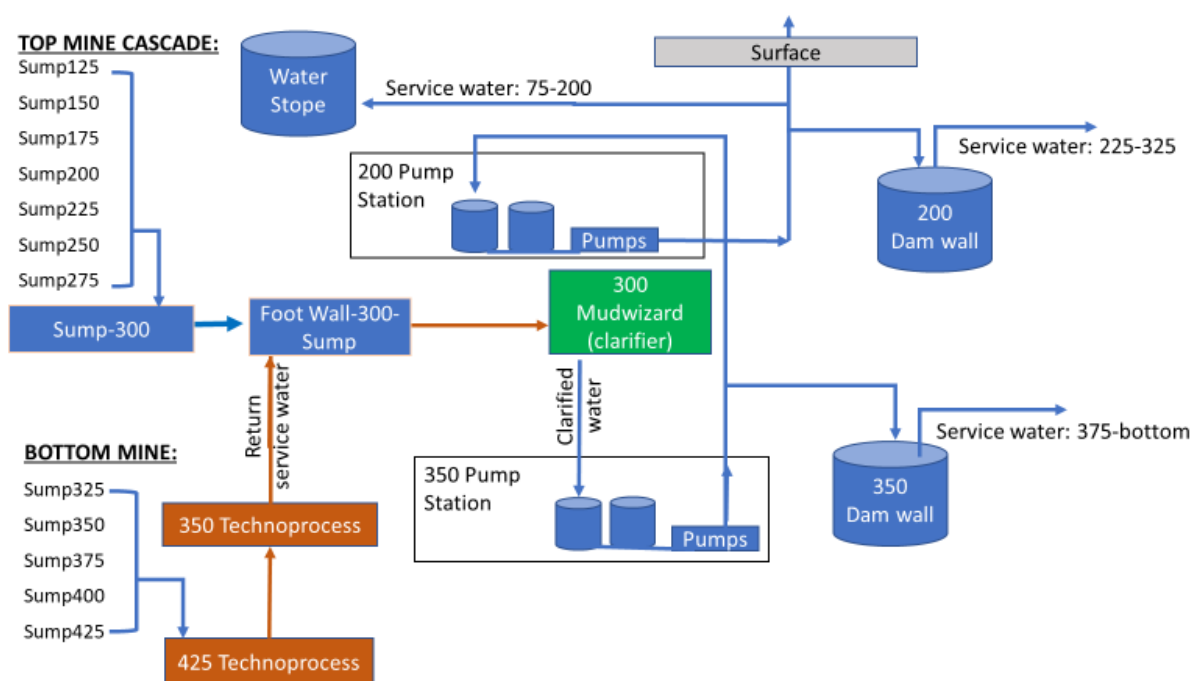
Interested Party:	NIRB	Rec No.:	NIRB-IR-023
Re:	Updated Underground Water Management Flow Sheet Diagram		

### Recommendation Made by Interested Party:

*Provide an updated version of the flowsheet in a more legible format.*

### Agnico Eagle's Response to Recommendation:

The flowsheet below presents a simplified version of the Underground Water Management.





<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-024</b>
<b>Re:</b>	<b>MEL-26 Sample point</b>		

**Recommendation Made by Interested Party:**

*Clarify the location of the sample point and port for the proposed waterline and discharge activities.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle proposes to have a sampling point at the waterline pumping station at the water treatment complex building.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-025</b>
<b>Re:</b>	<b>Spill response procedure</b>		

**Recommendation Made by Interested Party:**

*Clarify if flushing the saline spill with freshwater would be used as a response action, the timing of flush in the sequence of actions responding to the spill, and how this action would avoid drainage into nearby water bodies. If freshwater flushing was determined not appropriate, describe the follow-up actions that would be taken to ensure potential impacts to vegetation and wildlife habitat do not occur. Provide the spill management plan that contains this information along with other appropriate procedures for various saline spill scenarios.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle refers NIRB to the Appendix H – General Response Procedure for Spilled Saline Water of the Spill Contingency Plan submitted with the August 2020 FEIS Addendum.

*Spills on the AWAR and/or Bypass Road*

*In the case of accidental spills from the waterlines a spill management plan will be implemented that outlines appropriate procedures for collecting spilled product (e.g., vacuum recovery, or removal of any affected standing water combined with flushing in the summer with freshwater) to avoid any detectable environmental change where these spills may occur. During operations routine inspections, consistent with practices at the Mine for pipes, will be implemented along the waterline.*

The details requested by NIRB will be addressed as part of spill management plan that will be developed specifically for the spill event.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-026</b>
<b>Re:</b>	<b>Discharge pipe and diffuser location</b>		

**Recommendation Made by Interested Party:**

*Provide clarification on the proposed location of the discharge pipe and diffuser in relation to approved facilities.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle refers NIRB to the drawing section of the Meliadine Melvin Bay Diffuser Conceptual Design – Effluent Near Field Modelling which is located in the Appendix A of the August 2020 FEIS Addendum application package.

Interested Party:	NIRB	Rec No.:	NIRB-IR-027
Re:	Generation pathway - waterline burial		

**Recommendation Made by Interested Party:**

*Provide clarification on whether this generation pathway has been considered within the plan and if so provide mitigation and management measures to limit potential surface runoff.*

**Agnico Eagle's Response to Recommendation:**

An assessment of this generational pathway is provided in Appendix IR-8 of the response package.

Mitigation and management measures to limit potential surface runoff are similar to those used for the AWAR. Best management practices, with respect to sediment and erosion control, will be applied to prevent surface runoff from disturbed banks and subsequent sediment delivery to the channel during the construction period; particular attention will be directed to controlling runoff along the waterline during high precipitation events.

During the environmental assessment for the AWAR Fisheries and Oceans Canada, in a Screening Letter for the AWAR (dated 29 April 2011; Appendix D of Golder 2011), concluded that the AWAR Project would not likely result in impacts to fish and fish habitat, if appropriate mitigation measures were applied. Seven measures were listed including the following:

1. no in-stream work from 1 May to 15 July;
2. implementation of sediment control measures prior to and during construction;
3. sediment control measures to be maintained until all disturbed areas have been stabilized;
4. all disturbed areas to be stabilized and re-vegetated upon completion of work;
5. machinery to arrive on-site in clean condition and be maintained leak-free;
6. machinery to be washed, re-fuelled, and serviced away from the water to prevent entry of deleterious substances; and
7. maintenance of an emergency spill kit on-site in case of fluid leaks or spills from equipment.

Agnico Eagle views the waterline construction similar to the AWAR construction and has incorporated these conditions into the construction planning, and will abide by them during the construction program, with one exception. Agnico Eagle does not intend to re-vegetate the covers but will allow natural regeneration.

Where the waterline is covered, Agnico Eagle has also planned cross-drainage structures, where required, with a design conveyance consistent with the cross-drainage structures for the road. These would be regularly inspected to confirm they were not frozen and/or plugged from winter. Ponded water increases the risk of erosion and if ponding of water occurred, additional drainage structures would be added, which could include additional culverts. It should also be noted that covers would be designed to promote natural runoff with positive slopes on the cover material.

Where the waterline is not covered it will be constructed to avoid any interaction with any streams or ephemeral flowing water to avoid creating an obstruction. For example, it may be raised to the top of the culverts. It is anticipated that the waterline would not be covered where there is the potential for fish and fish habitat (see DFO- IR- 1 and 2).

**References:**

Golder (Golder Associates Ltd.). 2011. Phase 1 – Meliadine All-weather Access Road Project Description and Environmental Assessment. September 2011. Ref No. 1013730076-241.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-028</b>
<b>Re:</b>	<b>Monitoring for marine water quality</b>		

**Recommendation Made by Interested Party:**

*Clarify how the measures proposed in the 2019 Annual Report regarding more rigorous monitoring system for TSS and chlorine have been incorporated into the ODMP. Provide the details of how the monitoring system would be updated to be 'more rigorous'. Provide information on the updates to the SETP that will 'improve treatment performance and process reliability'.*

**Agnico Eagle's Response to Recommendation:**

As presented in the Annual report answers report, the following mitigation were tested / implemented in 2019 and included in 2020 design:

- Measurement of VSS in water sample to better understand TSS values;
- Use of algicide in 2019 in SP3;
- Increase of GAC filter backwash for a better chlorine removal in 2019;
- In 2020, more GAC filter were added to have more redundancy for chlorine removal and have activated carbon in inventory;
- Testing of quenching solution in 2019 following toxicity exceedance;
- A closer follow up of turbidity in the plant prior to discharge.

For the water treatment plant feeding the waterline, turbidity measurement as well as chlorine follow up will be implemented online prior to feeding the waterline. Also, a quenching solution will be implemented in the plant to have more reliability on chlorine removal. Finally, the need of having an intermediate pond between the treatment plant and the water line pumping station will be evaluated. If it is required, then additional mitigations measures will be investigated to control the development of algae such as ultrasounds, pond cover, etc. The most favorable option would be not using the intermediate pond and feed directly the pumping station with treated water.

<b>Interested Party:</b>	<b>NIRB</b>	<b>Rec No.:</b>	<b>NIRB-IR-029</b>
<b>Re:</b>	<b>Monitoring locations</b>		

**Recommendation Made by Interested Party:**

*Clarify the monitoring locations that would be in place for the proposed discharge activities.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle confirms there was a typo Table 4 of the ODMP. The sampling stations for the Receiving Environment and Exposure Area would move approximately 400 m west from the currently approved diffuser monitoring locations to align per the new diffuser location within Melvin Bay off the peninsula, once approved and prior to discharge. Note that the Reference Area A monitoring location will be unchanged.

Interested Party:	NIRB	Rec No.:	NIRB-IR-030
Re:	Groundwater inflow predictions		

**Recommendation Made by Interested Party:**

*Provide the document "Golder 2020, 2019 Updated Predictions of Groundwater Inflow to Tiriganiaq Underground Mine. April 2020" or provide the location of this document on the NIRB public registry.*

**Agnico Eagle's Response to Recommendation:**

Please refer to Appendix IR-9 of this response package for the report.



## **TRANSPORT CANADA (TC)**

Interested Party:	TC	Rec No.:	TC-IR-01
Re:	Regulatory Regime		

**Recommendation Made by Interested Party:**

*Change title of legislation from Navigation Protection Act to Canadian Navigable Waters Act.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle appreciates comment by Transport Canada and will refer to *Canadian Navigable Waters Act* in future communication.

<b>Interested Party:</b>	<b>TC</b>	<b>Rec No.:</b>	<b>TC-IR-02</b>
<b>Re:</b>	<b>Regulatory Regime</b>		

**Recommendation Made by Interested Party:**

*Change title of legislation from Navigation Protection Act to Canadian Navigable Waters Act.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle appreciates comment by Transport Canada and will refer to *Canadian Navigable Waters Act* in future communication.

<b>Interested Party:</b>	<b>TC</b>	<b>Rec No.:</b>	<b>TC-IR-03</b>
<b>Re:</b>	<b>Regulatory Regime</b>		

**Recommendation Made by Interested Party:**

*Change title of legislation from Navigable Waters Protection Act to Canadian Navigable Waters Act.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle appreciates comment by Transport Canada and will refer to *Canadian Navigable Waters Act* in future communication.

<b>Interested Party:</b>	<b>TC</b>	<b>Rec No.:</b>	<b>TC-IR-04</b>
<b>Re:</b>	<b>Regulatory Regime</b>		

**Recommendation Made by Interested Party:**

*Change title of legislation from Canadian Navigable Waters Act to Navigation Protection Act.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle appreciates comment by Transport Canada and will refer to *Navigation Protection Act* in future communication.

<b>Interested Party:</b>	<b>TC</b>	<b>Rec No.:</b>	<b>TC-IR-05</b>
<b>Re:</b>	<b>Regulatory Regime</b>		

**Recommendation Made by Interested Party:**

*Change title of legislation from Navigation Protection Act to Canadian Navigable Waters Act.*

**Agnico Eagle's Response to Recommendation:**

Agnico Eagle appreciates comment by Transport Canada and will refer to *Canadian Navigable Waters Act* in future communication.

<b>Interested Party:</b>	<b>TC</b>	<b>Rec No.:</b>	<b>TC-IR-06</b>
<b>Re:</b>	<b>Removal of existing marine pipeline and diffuser</b>		

**Recommendation Made by Interested Party:**

*Transport Canada requires the following information:*

- *Clarification of the proponent's plan for the existing marine pipeline and diffuser after it is decommissioned.*
- *A removal plan for the existing diffuser if it will be removed as part of the project.*
- *If there are now plans to leave the existing diffuser in place, confirmation the proponent will submit an application for the amendment of Navigation Protection Act Approval 2019-600003.*

**Agnico Eagle's Response to Recommendation:**

**Bullet 1**

As outlined in Section 3.3 of the August 2020 FEIS Addendum, the existing installation (including the water storage tank, the pump house, and diffuser) will remain functional until the implementation of the future and permanent installations, at which point they will be decommissioned as per the approved process, as described Project Certificate No. 006 Term and Condition 130:

*The Proponent shall remove the subsea pipeline and diffuser in Melvin Bay when the pipeline is no longer in use unless it can be demonstrated to the satisfaction of the Nunavut Impact Review Board that this infrastructure will provide a net positive environmental effect to the local ecosystem.*

**Bullet 2**

Agnico Eagle will continue to adhere to Condition Number 11 of the *Navigation Protection Act* approval (2019-600003) for the existing marine pipeline and diffuser which states, "All portions of the existing work must be completely removed from the natural bed of the waterway immediately upon termination of the work(s)", once the implementation of the future and permanent installation is in place.

Agnico Eagle will work with Transport Canada for an amendment to the Approval once the new infrastructure is in place, as well as adhere to Project Certificate No. 006, Term and Condition 130.

**Bullet 3**

There are no new plans to leave the existing marine pipeline and diffuser in place.