August 25th, 2017

Karen Kharatyan
Manager of Licensing
Nunavut Water Board
P.O Box 119
Gjoa Haven, NU X0B 1J0

Re: Agnico Eagle Mines – Meliadine Division Response to ECCC concerns over Final Effluent System Final Design and Construction Drawings

Dear Mr. Kharatyan,

As requested, the following information and comments are intended to address the concerns outlined in the below letter:

- ECCC – August 18, 2017, *2AM-MEL1631 – Agnico Eagle Mines Ltd. – Meliadine Gold Mine – Final Effluent System Proponent Response*

Should you have any questions or require further information, please do not hesitate to contact me.

Best regards,

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Environmental Compliance Counselor

Comment 1:
ECCC is satisfied with the majority of Agnico Eagle Mines Ltd. (the Proponent's) responses to ECCC's comments on the Meliadine Final Design for the Final Effluent System. However, ECCC has concerns with the Proponent's response to ECCC's Comment #3, Discharge Concentrations.

ECCC does not agree with the Proponent's response as comparisons are being made between discharge quality for a future operating mine (including mill and full camp) to discharge quality for the pre/construction stage project at Meliadine (no milling or processing) and to Vault (no mill nor camp, just minewater). ECCC continues to have concerns that discharge predictions have been under-estimated in the modeling and there may be exceedances of the objectives at the edge of the mixing zone and/or edge of the lake.

Agnico Eagle Mines response:

The Meliadine Type A Water Licence criteria were developed based on predicted effluent quality and quantity, dilution capacity in the mixing zone (as predicted from a conceptual diffuser design), predicted water quality concentrations at the edge of the mixing zone, and allowance for potential upsets that could skew the average concentrations in the actual effluent. At no time was it assumed that the quality of continuously discharged effluent would equal the average or maximum end-of-pipe Type A limits.

Through the water licencing process for Meliadine, licence limits higher than predictions were requested in the event that a spike occurred from flushing of the lines or some other event that would cause a single pulse. These limits are required to keep the mine in compliance during operations.

It is not the intention of Agnico Eagle to manage the mine to the licence limits, but rather manage through consistent practices and adaptive management so as to minimize effects, provide confidence to the regulators, and decrease risk.

As part of the annual report, the monitored data will be compared to the predictions. If conditions trend different than expected, the adaptive management process will be initiated where sources of constituents of concern will be identified and mitigations applied to reduce those sources.

The final diffuser (Tetra Tech 2017) was designed using the total predicted concentrations for CP1 (as developed for the Type A licence; presented in Table 3.3 of Tetra Tech [2017]) under three water quantity/pumping scenarios. The design considered the pre/construction through the full operating phase of the mine. The model predicts build-up of constituents over time until an equilibrium is reached in Year 7.

The modelled water quality for the mixing zone, using the final diffuser design (Tetra Tech 2017), suggests that the edge of mixing zone objectives will be achieved when final effluent is as predicted for the Type A licence. Water quality concentrations at the edge of the mixing zone will be equal to or less than the SSWQO or CCME for protection of aquatic life. This model run is considered a realistic scenario.

Water collecting in CP1 represents early phase mine development water quality and is in compliance with the licence limits (Table 1) and is acceptable for discharge (NWT Water Board 1992).

Table 1. Summary of Measured Data from CP1 as Compared to Predictions and Type A Licence Limits

	Measured Data[a] as Percent of Predictions		Measured Data[a] as Percent of Type A Licence	
Parameter	Average	Maximum	Average	Maximum
Total Dissolved Solids	527%	292%	76%	88%
Total Suspended Solids	62%	117%[b]	62%	117%[b]
pH	-	83%	-	83%
NH4 (as N)	78%	55%	26%	24%
Total Phosphorus (P)	7%	5%	2%	1%
Aluminum	7%	36%	4%	15%
Arsenic	1%	0%	1%	0%
Copper	44%	38%	1%	0%
Lead	11%	15%	0%	0%
Nickel	66%	97%	0%	0%
Zinc	68%	51%	2%	1%

Note:
a Data collected weekly from 7 June to 26 July 2017.
b Total suspended solids in one sample was above the licence limit; sample was collected on a windy day.

A model scenario where effluent quality is consistently at the average maximum licence limits is considered highly unlikely. As mentioned above, the higher licence limits were requested to account for potential spikes that occur as part of regular operations. As requested by ECCC, a model run was conducted assuming effluent quality is always equal to the licensed average concentration. In the highly unlikely event that effluent is continuously discharged at the average licence limits, the model suggests that phosphorus, copper, and lead could exceed the CCME guidelines at the edge of the mixing zone. Even in this highly unlikely scenario, there would be time to respond and mitigate. As part of

operating the Meliadine Mine, there will be regular monitoring, data review, comparison of data to triggers to guide the operations team, comparison of data to predictions, mitigations, and adaptive management that would be enacted before this unlikely scenario occurred.

The mitigation and adaptive management process will include:

- *Collection of water quality samples following the approved frequency*
- *Regular review of monitoring data as it is provided by the laboratory with screening of data to triggers*
    - *Triggers would be set as 50 and 75 percent of the predictions, and 25 and 50 percent of the licence limits*
- *If data trend as expected (i.e., less than 50 percent of the predictions), continue monitoring*
- *If data start to increase in trends and approach 50 percent of the predictions, investigate sources for the constituent of interest and continue monitoring*
    - *Investigate options such as treatment or storage of water*
    - *During this time discharging to the diffuser would be stopped*

Reference:

Northwest Territories Water Board. 1992. Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories.