



Environmental Protection Operations Directorate
Prairie & Northern Region
5019 52nd Street, 4th Floor
P.O. Box 2310
Yellowknife, NT X1A 2P7

July 19, 2017

ECCC File: 6100 000 012/015
NWB File: 2AM-MEL1631

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

Via email: licensing@nwb-oen.ca

RE: 2AM-MEL1631 – Agnico Eagle Mines Ltd. – Meliadine Mine – Final Design for the Final Effluent System

Attention: Karen Kharatyan

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Nunavut Water Board regarding the above-mentioned design for the final effluent system. ECCC's specialist advice is provided based on our mandate, in the context of the *Canadian Environmental Protection Act*, the pollution prevention provisions of the *Fisheries Act*, the *Migratory Birds Convention Act*, and the *Species at Risk Act*.

The following comments are provided:

1. Modeling of Scenarios

Sections 2.2 and 7.0 describe the three scenarios which were modeled (base case, one or two wet years, base case plus higher discharge volumes).

- a) Scenario 2 models both 1 and 2 wet years, and assumes that the concentration of parameters remains the same in the increased volumes of effluent to be discharged. It is unclear why the concentrations would not be lower – intuitively, higher precipitation would dilute the concentration of parameters in the discharge, and higher volumes going into/through the lake would provide greater dilution.

ECCC recommends that the Proponent clarify why the concentration of parameters in the discharge are not lower.

- b) The worst case scenario could be low precipitation years, when freshwater inputs are lower, but parameters associated with mining would remain constant. This scenario has not been modeled.

ECCC recommends that the Proponent provide rationale for not modeling this worst case scenario, or provide model results for one and two dry years as a fourth scenario.

- c) ECCC notes that 1997 was selected for use in analyzing flow rates, due to availability of data. This was a dry year, with flow rates about 25% lower than other years. The flow rates were adjusted by multiplying the flows in June by 4.

ECCC recommends that the Proponent explain how the predicted dilution ratio would change if the June flows are not multiplied and loadings are left constant (i.e. how a dry year would affect dilution).

2. Lake Volumes

Bathymetry for the sub-basin of Meliadine Lake has been extrapolated and may not be accurate. If the volume has been underestimated or overestimated, predictions of lake concentrations will be affected.

ECCC recommends that water quality predictions based on the modeled dilution be validated during operations with ongoing monitoring in the receiving environment, specifically over the model domain area of the lake. ECCC anticipates that the Aquatic Effects Monitoring Program will pick up changes in chemistry and recommends that any substantial variation from predictions should be flagged.

3. Discharge Concentrations

Predicted monthly average concentrations of effluent constituents were used to model the parameters. These values were well below licence criteria for regulated parameters, and if the monthly averages have been under-predicted, the discharge concentrations could be as high as the end-of-pipe discharge criteria. It would have been conservative to also provide predictions based on licence criteria, to identify whether discharge at the licence limits could potentially result in exceedance of the objectives at the edge of the mixing zone or in the lake over time as concentrations accumulate.

ECCC recommends running the model with licence criteria for regulated parameters.

4. Clarification of Monitoring Site Designations

The design report references the March 2017 Water Management Plan, and the requirements that are to be met at end-of-pipe and in the mixing zone. Looking at the Water Management Plan, these sites are designated MEL_14 and MEL_13, respectively. In the Water Licence, the sites are named MEL-04 and MEL-03, respectively. While the design document doesn't name the sites that criteria and objectives are to be applied to, the supporting documentation is confusing.

ECCC recommends that the Proponent clarify the names of the end-of-pipe and edge of mixing zone monitoring stations.

Should you require further information, please do not hesitate to contact me at (867) 669-4733 or Melissa.Pinto@canada.ca.

Sincerely,



Melissa Pinto
Senior Environmental Assessment Coordinator

cc: Loretta Ransom, A/Head, Environmental Assessment North (NT and NU)
ECCC Review Team