



ᓄᓇᓂᓪ ᐃᓕᓕᓂᓪ ᑲᓂᓕᓂᓪ  
NUNAVUT WATER BOARD  
NUNAVUT IMALIRIYIN KATIMAYINGI  
OFFICE DES EAUX DU NUNAVUT

**File No: 2AM-WTP1826 / B13**

April 25, 2019

Martin Theriault  
Environmental Compliance Counselor  
Agnico Eagle Mines Limited  
145, King Street East Suite 400,  
Toronto, ON M5C 2Y7  
E-mail: [martin.theriault@agnicoeagle.com](mailto:martin.theriault@agnicoeagle.com)

**Re: Updated Groundwater Monitoring Plan; Type “A” Water Licence No. 2AM-WTP1826, Whale Tail Pit Project; Agnico Eagle Mines Limited.**

---

Dear Mr. Theriault:

Further to the Nunavut Water Board (NWB or Board) January 28, 2019 correspondence to Agnico Eagle Mines Limited (Agnico Eagle or Licensee), on February 20, 2019, the NWB received from Agnico Eagle an updated Groundwater Monitoring Plan Version 2.1, February 2019 (GWMP or Plan) as per Part B Item 13 of the Water Licence 2AM-WTP1826 (Licence), including a Technical Memorandum – 2018 Westbay System Groundwater Monitoring Investigation dated February 8, 2019 and completed by Golder Associates Ltd. (Golder).

The revised GWMP stated that the Plan reflects the commitments made with respect to submissions provided during the technical review of the FEIS, to comply with Terms and Conditions No. 15 and 16 included in the Project Certificate. This version of the plan includes:

1. Sampling results of the multi-level Westbay well system, that were completed in November 2018;
2. Thermal analyses completed in 2018;
3. Groundwater monitoring plan for horizontal and vertical groundwater flow; and
4. Threshold and adaptive management plan related to the groundwater management.

The NWB distributed the updated GWMP for a public review with a deadline set at March 1, 2019. On March 1, 2019, comments were received from Kivalliq Inuit Association (KivIA), Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) and Environment and Climate Change Canada. On March 8, 2019, Agnico Eagle provided its responses to comments.

CIRNAC Comments

CIRNAC stated that it remains firm on comment #3 (thermal monitoring), comment #4 (threshold and adaptive management), comment #9 (pit seep quality monitoring), and comment #11 (trigger level reporting).

Comment #1 (comment numbers correspond to CIRNAC's January 17, 2019 response to Groundwater Monitoring Plan Version 2.0)

CIRNAC thinks that at least one additional subpermafrost groundwater monitoring well should be installed to characterize the local groundwater regime and changes to the vertical groundwater in combination with the existing 2016 Westbay Multiport Well system. In the absence of installing at least one additional deep groundwater monitoring well, and after reviewing the data AEM has provided to date, CIRNAC requests more frequent monitoring, data analysis and reporting to manage the uncertainties and long-term risks.

#### Agnico Eagle Response

Agnico Eagle stated that *it continues to be of the view that additional wells are not appropriate in the circumstances*, and referred to its January 15, 2019 reply to CIRNAC, stating that

*The installation of additional wells outside of the Westbay is not considered necessary to further characterize baseline conditions and reduce uncertainties regarding potential environmental effects of the project on the groundwater flow system. Potential hydraulic gradients and flow directions for baseline and long-term post-closure conditions can be derived from the relative lake elevations in the study area as described in Agnico Eagle's response to CIRNAC's recommendation regarding Background, Results of Review. During mining, flow will be towards the pit, and the relative elevation of the lake level behind the dike, in combination with the attenuation pond elevation and dewatered pit elevation can be used to estimate hydraulic gradient.*

The NWB agrees that deep groundwater flow and quality monitoring in flow paths adjacent to the pit will help to better characterize the hydrogeological setting and assess potential water quality impacts from the project during closure and post-closure phases. The Board also realizes the potential expense and difficulty of installing monitoring wells beneath the permafrost, and notes that while the need for additional deep monitoring well could be assessed prior to closure / post-closure based on all monitoring information, continuous and adequate monitoring of existing Westbay Multiport Well system is essential at this stage. The Licensee shall do its best to ensure that the Westbay system remains in good working order. The Board agrees that *groundwater quality during operations can be verified through the collection of samples from the pit sump and seepage faces along the pit walls in the summer months.*

#### Comment #3

CIRNAC is of opinion that thermistors AMQ17-1277A and AMQ15-452 will be destroyed during active mining as they are located within the Whale Tail Pit footprint, and insists replacement of

these thermistors in the vicinity of the Whale Tail Pit ‘north wall’ to detect pit wall freeze/thaw be committed to, and the proposed replacement thermistor locations and depths be specified in, AEM’s groundwater adaptive management plan. Future thermistors should have temperature readings both within and below the active layer. The GWMP should state the thermistors have, at minimum, a quarterly frequency of observations as per Part I Item 15 of the 2AM-WTP1826 water licence, and that the thermistor data is submitted in the Annual Report.

The groundwater adaptive management section should include a commitment to installing groundwater monitoring wells in the active layer and thresholds for installing these.

#### Agnico Eagle Response

*Agnico is confident that the thermistors AMQ17-1233 and AMQ17-337 will provide reliable data in order to confirm permafrost degradation between the Nemo Lake and the Whale Tail pit that will determine if a horizontal water pathway is developed, however, as mentioned multiple times, likelihood of this risk is really low based on the results of the multiple thermal assessments that were conducted for this project. It is noted that in Table 4 "Groundwater Adaptive Management Plan" it states that if AMQ17-1233 and AMQ17-337 show sign of permafrost degradation below the active layer, one of the potential adaptive management measures would be to install new thermistor(s) to evaluate the extent of the permafrost degradation.*

*With respect to CIRNAC's recommendation that future thermistors are installed with temperature readings both within and below the active layer, Agnico Eagle will consider and evaluate the request from CIRNAC in the installation of future thermistors on the site.*

*With respect to CIRNAC's recommendation to revise the Groundwater Monitoring Plan to state the thermistors have, at minimum, a quarterly frequency of observations as per Part I Item 15 of 2AM-WTP1826, and that the thermistor data is submitted in the Annual Report, Agnico does not agree that NWB approval of the GWMP v. 2.1 should be further delayed for a item of this nature that is already required under 2AM-WTP1826.*

The Board acknowledges Agnico Eagle’s commitments to closely monitor the permafrost and its potential degradation, and if required to install new thermistors as per adaptive management measures. The NWB agrees with CIRNAC that these potential future thermistors should be with temperature readings within and below the active layer.

The Board is aware that under the Nunavut Impact Review Board (NIRB) Project Certificate Item 14 a Thermal Monitoring Plan *should be submitted to NIRB at least 60 days prior to the start of construction of these facilities, with subsequent updates submitted annually thereafter or as may otherwise be required by the NIRB*, and acknowledges Agnico Eagle’s commitment to report to NWB the results of annual thermal assessment.

#### Comment #4(b)

It was stated that Agnico Eagle previously agreed to provide options available for mitigation, if arsenic concerns materialized and incorporate these mitigation measures in the plans being

submitted under Part B Item 15 of the 2AM-WTP1826 water licence. CIRNAC is of opinion that current the plans do not contain this information, including but not limited to the ARD-ML monitoring plan, Water Quality and Flow Monitoring Plan, Water Management Plan and Waste Management Plan, and requires that Agnico Eagle AEM identify which plan(s) will contain the details of the adaptive management actions for Waste Rock Storage Facility (WRSF) water discharge, and that the plan(s) are submitted with the 2018 Annual Report to the NWB for approval prior to additional waste rock deposition in the Waste Rocks Storage Facility (WRSF).

#### Agnico Eagle Response

Agnico refers to specific references in particular, which we believe resolves Comment 4(b):

- Table 5.1 "Adaptive Management Actions Associated with the ARD/ML Plan", included in the Operational ARD-ML Sampling and Testing Plan - Whale Tail Pit Addendum, Nov. 2018, v. 3 (approved by Board motion No. 2018-A1-026, dated January 28, 2019, as required by Part B, Item 13 of the Licence);
- Section 3, Whale Tail Pit Water Quality and Flow Monitoring Plan, Oct. 2018, v. 5 (approved by Board motion No. 2018-A1-025, dated January 21, 2019, as required by Part B, Item 14 of the Licence.)

The NWB acknowledges Agnico Eagle response and advises once again that all adaptive management actions and associated monitoring shall be performed as per above stated approved management plans.

#### Comment #9

Section 3.2.1 of Groundwater Monitoring Plan Version 2.1 indicates *that periodic seepage surveys will be conducted twice during the first year of operations and annually thereafter*. Section 3.2.2 states *“water samples will also be collected from seeps in the pit walls if there is sufficient water for analysis and if access to the seep is possible.”* Due to AEM’s high reliance on seeps to validate the horizontal and vertical groundwater flow models and inform the adaptive management plan, CIRNAC is adamant that the seep minimum frequency of observations and monitoring parameters adheres to Part I Item 15 and Schedule I Table 2 of the 2AM-WTP1826 water licence.

#### Agnico Eagle Response

*With respect to CIRNAC's recommendation that the minimum seep frequency of observations and monitoring parameters adheres to Part I Item 15 and Schedule I Table 2 of the 2AM-WTP1826 water licence, Agnico notes that this is already a legal requirement and Agnico will be complying with 2AM-WTP1826...*

The NWB acknowledges Agnico Eagle response to fully adhere to Licence requirements and notes that although *this was not an item flagged by the NWB in its letter to Agnico of January 21, 2019*, this section should still be updated in the next version of GWMP to be fully aligned with the

Licence requirements. The NWB also notes that the Schedule I, Table 2 referenced within Agnico Eagle response varies from the actual table included within the Licence regarding the Frequency of Monitoring at ST-S-1 to TBD during Closure.

#### Comment #11

CIRNAC notes that Section 3.3 and Table of Plan includes thresholds for groundwater quality parameters set by six-month averaging period of observations and concerned that gradual increases in parameter concentrations would not trigger adaptive management. It is also noted that there is not comparable threshold for arsenic concentrations which would allow for the early identification of potential water quality issues that might arise during the closure and post-closure phases. CIRNAC recommends threshold and trigger values are fixed numbers as agreed upon by the NWB and interested parties, and that an arsenic concentration threshold and trigger be included in the plan.

CIRNAC indicated that reporting to the NWB, CIRNAC and KIA when trigger levels are reached is essential in addressing uncertainties and potential risks around long-term water treatment unique to the Whale Tail Pit project.

#### Agnico Eagle Response

*Agnico does not agree with CIRNAC's recommendation for threshold and trigger values as fixed numbers, and does not agree that arsenic concentration and trigger should be included in the plan. As predicted by the hydrological assessment, the total suspended solids in the groundwater reporting to the pit will gradually increase during the mining of the Whale Tail pit as the bottom pit elevation will decrease. Agnico consider that the six-month averaging period methodology is aligned with the model prediction and will be efficient to trigger adaptive management. Agnico Eagle will measure arsenic concentration reporting to the pit and will use this information to update the water balance and water quality forecast on a yearly basis. Agnico Eagle considers that this annual assessment of the site water quality is the appropriate tool to confirm the prediction and trigger adaptive management as required. This adaptive management strategy is presented in the ARD-ML monitoring plan...*

*Agnico will already be providing monitoring data to the NWB on the schedules required under No. 2AM-WTP1826. It is Agnico's expectation that CIRNAC will continue to monitor that data, and should they have any questions about trends in that monitoring, Agnico will be pleased to engage as such questions are identified.*

The NWB is of opinion that setting up fixed threshold and trigger values along with potential thresholds and triggers for As concentrations could be evaluated in the future, prior to closure / post-closure based on the available monitoring results, including groundwater inflow and seep or seepage monitoring. The Board also thinks that informing NWB, CIRNAC and KivIA when trigger levels are reached is not critical at this stage, and the risks could be mitigated by adequate adaptive management actions. The Board expects that all interested parties will assess along with

the NWB the monitoring data provided by Agnico Eagle as per Licence requirements, and encourage parties to engage the Licensee about any questions related to monitoring results.

#### ECCC Comments

ECCC recommended that a statement be included, requiring the Licensee to update the Groundwater Monitoring Plan annually.

#### Agnico Eagle Response

*It is not necessary to include this statement in the plan as the plan will be reviewed by Agnico annually as part of its continuing compliance with Part B, Item 17 of Type A Water Licence 2AM-WTP1826.*

ECCC recommends that the Proponent update the seepage monitoring commitments in Section 3.2.1 (Water Quantity) of the Groundwater Monitoring Plan and in any other relevant sections to *collect samples from Pit Seepage ST-S-1 (Seeps – TBD) on a monthly basis or as found; and to complete a seepage assessment twice a year for the first two years and once a year starting in the third year, and continuing until the end of operations.*

#### Agnico Eagle Response

*ECCC's original recommendation did not request these seepage monitoring statements be incorporated in the GWMP. On January 15, 2019, NWB asked Interveners to advise the Board by January 17, 2019, on whether or not Agnico Eagle additional responses address their concerns. ECCC did not raise this issue in response. NWB also did not indicate in its letter to Agnico of Jan. 28, 2019 that this item should be included in a revised GWMP.*

The NWB acknowledges Agnico Eagle's commitments regarding seepage monitoring and assessment, and looks forward for this information. While the Board is of opinion that these commitments and Licence requirements shall be followed immediately, the NWB expectation is that the next version of the GWMP shall include respective wording regarding seepage monitoring and assessment.

#### KivIA Comments

The KivIA indicated that it supports CIRNAC's un-resolved comments #3, #4, #9 and #11.

It should be noted that a discussion is already provided with respect to these questions.

After reviewing the updated Plan and considering all representations made by interested persons, and Licensee, the NWB, hereby approves the updated Groundwater Monitoring Plan, Version 2.1,

February 2019 through the Board Motion No. 2019-A1-002, dated April 24, 2019, as required by Part B, Item 13 of the Licence. The Licensee shall ensure that details of seepage monitoring, fully aligned with the Licence requirements and Licensee's commitments are included within the next update to the Plan.

The Board notes the difference of views regarding some items that are essentially associated with the closure/ post-closure stages of project. The Board finds that the need for some additional or revised process/action items recommended by relevant party and discussed above could be re-assessed prior to the closure stage when more information will be available. The Board would like to remind that management plans are "living documents" to be updated as required by changes in operation and/or technology.

Should you have any questions or require clarification with respect to the above, please feel free to contact undersigned at (867) 360-6338 (Ext. 35) or by e-mail to [karen.kharatyan@nwb-oen.ca](mailto:karen.kharatyan@nwb-oen.ca).

Sincerely,  
**NUNAVUT WATER BOARD**

Karén Kharatyan  
Director Technical Services