



Indian and Northern  
Affairs Canada

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Nunavut Regional Office  
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May 29, 2009

*Via Email*

Richard Dwyer  
Licensing Administrator  
Nunavut Water Board  
P.O. Box 119  
Gjoa Haven, NU X0E 1J0

Dear Richard,

**Subject      Water License #2AM-MEA0815, Agnico-Eagle Mines Ltd.,  
Meadowbank Gold Project, Kivalliq Region, Submission of  
Aquatic Effects Management Program**

Please be advised that, on behalf of Indian and Northern Affairs Canada, I have completed a review of the above referenced document submitted to the Nunavut Water Board by Agnico-Eagle Mines Ltd.

A Technical Review Memorandum (attached) is provided to the Board for consideration.

Should you have any questions regarding this submission, feel free to contact me at 867-975-4555 or [David.Abernethy@inac-ainc.gc.ca](mailto:David.Abernethy@inac-ainc.gc.ca).

Regards,  
David W. Abernethy

Cc.    Kevin Buck, Water Resources Division Manager

# Technical Review Memorandum

Date: May 29/09

To: Richard Dwyer, Nunavut Water Board

From: David Abernethy, Indian and Northern Affairs Canada, Water Resources Division, Nunavut Regional Office

Re: **Water License #2AM-MEA0815 – Part I, Item #1, Agnico-Eagle Mines Ltd., Meadowbank Gold Project, Aquatic Effects Management Program – Version 1, Mar. '09**

## A. PROJECT DESCRIPTION

On Apr. 30/09 the Nunavut Water Board (NWB or Board) distributed Agnico-Eagle Mines Ltd.'s (AEM) Mar. '09 Aquatic Effects Management Program (AEMP or Program), requesting representations from interested parties by May 30/09. This submission is required by License condition Part I, Item #1, which reads:

"The Licensee shall submit to the Board for approval by Mar. 31/09, a revised Aquatic Effects Management Program (AEMP) prepared in consultation with Department of Fisheries and Oceans, Environment Canada, and Indian and Northern Affairs Canada. The revised AEMP shall include:

- a. A detailed monitoring protocol to verify that the Canadian Council of Ministers of Environment Fresh Water Aquatic Life guidelines are met thirty (30) metres from the outfall diffusers;
- b. Annual reporting for more immediate adaptive management;
- c. Mechanisms to measure changes to productivity in the lake as a result of the mine adding nutrients;
- d. Sampling and Analysis Plans; and,
- e. Monitoring under Fisheries Authorizations, NWB License Compliance Monitoring, Environmental Effects Monitoring, and Groundwater Monitoring.

The following documentation was made available for review:

- AEM. *Meadowbank Gold Project Aquatic Effects Management Program, Version 1*. March 2009.

- Section 1A: Aquatic Effects Management Program, Version 1. October 2005;
- Section 1B: Standard Operationd Procedures for Receiving Environment Sampling, Version 1. May 2008;
- Section 1C: Metal Mining Effluent Regulations Plan, Version 1. October 2005;
- Section 2A: Habitat Compensation Monitoring Plan – Mine, Version 1. May 2008;
- Section 2B: Habitat Compensation Monitoring Plan – Western Channel Temporary Crossing, Version 1. May 2008;
- Section 2C: Tier 2 and 3 Habitat Compensation Monitoring Plan, Version 1. March 2009;
- Section 2D: Monitoring Plan for AWPARG HADD Crossings, Version 1. June 2007;
- Section 3A: Water Quality and Flow Monitoring Plan, Version 1. August 2008;
- Section 3B: Groundwater Monitoring Plan, Version 2. March 2009;
- Section 3C: Water Quality Monitoring Plan for Dike Construction and Dewatering, Version 2. March 2009;
- Section 3D: Quality Assurance Quality Control Plan, Version 1. January 2009; and,
- Section 4A: Fish Out Program, Version 1. May 2008.

## **B. RESULTS OF REVIEW**

The following comments and recommendations are provided to the Board for consideration:

### **1. General**

- The submitted Program is comprehensive and considers individual monitoring plans associated with aquatic monitoring and management

plans specific to the Meadowbank Gold Project. While INAC concurs that this approach is practical, allowing for revisions to specific documents without the need for changing the entire Program, it is difficult to determine whether all five (5) aspects required by the Board in a revised Program, as specified in Part I, Item #1, are included in this submission. The revised AEMP cover letter states that “a comprehensive review and redesign of the Aquatic Effects Management Program is currently underway and that this Program will be renamed as the Receiving Environment Monitoring and Management Plan.”

To ensure that this new Plan will include the requirements specified in Part I, Item #1 of the license, INAC recommends that the Board require AEM to submit documentation that clearly illustrates where each of the required elements listed in Part I, Item # 1 (a – e) are addressed within the new Receiving Environment Monitoring and Management Plan (REMMP).

## **2. Part I, Item #1a**

***“A detailed monitoring protocol to verify that the Canadian Council of Ministers of Environment Fresh Water Aquatic Life guidelines are met thirty (30) metres from the outfall diffusers.”***

- The revised AEMP cover letter states that “water sampling stations included in this program were identified based on proposed effluent discharge strategy for the mine. Consequently, Sections 7.1 and 7.2 of the AEMP specifically address the outfall diffusers and the requirement to meet CCME water quality guidelines 30 metres from the outfall diffusers.” A review of Sec 7.1 and 7.2 of the AEMP revealed no specific reference to outfall diffusers and the requirement to meet CCME criteria 30 meters from the outfall diffusers. Therefore there appears to be no revision in this regard when compared to the October 2005 AEMP. INAC recommends that the Board require AEM to include (or indicate where these details are included in their AEMP submission) these details in any new REMMP.

## **3. Part I, Item #1b**

***“Annual reporting for more immediate adaptive management.”***

- The individual monitoring plans included in the revised AEMP include triggers that, for the most part, correspond with license monitoring requirements and prompt immediate adaptive management. This is evident in the August 2008 Water Quality and Flow Monitoring Plan’s adaptive management program and the March 2009 Water Quality and Management Plan for Dike Construction and Dewatering standard operating procedures.

For transparency purposes, INAC recommends that the Board require AEM to submit documentation that clearly illustrates where annual reporting requirements for immediate adaptive management purposes are addressed (or indicate where these details are included in their AEMP submission) in any new REMMP.

**4. Part I, Item #1c**

***“Mechanisms to measure changes to productivity in the lake as a result of the mine adding nutrients.”***

- The revised AEMP cover letter states that “mechanisms to measure changes to productivity in the lakes as a result of the addition of nutrients are addressed in the AEMP. Sections 7.4 and 7.5 outline the monitoring plans for periphyton and phytoplankton, respectively. Both of these organisms are indicators of lake productivity.”

While INAC is cognisant that organic growth in the receiving aquatic environment can indicate changes in nutrient loadings, it is recommended that AEM be required to conduct targeted water quality analyses in various locations throughout the open water season to monitor nutrient levels within the project lakes (particularly Third Portage Lake and Wally Lake). As a minimum, these analyses should include TSS, TDS, Ammonia as Nitrogen, Total Phosphorus, and Total Carbon. AEM must ensure that any new REMMP includes details for all monitoring locations, sampling frequency, monitored parameters, and reporting methods.

**5. Part I, Item #1d**

***“Sampling and Analysis Plans.”***

- It appears that water quality sampling and analysis plans are included within the submitted AEMP, particularly within the individual monitoring plans. INAC recommends that the Board require AEM to incorporate the comments / recommendations provided in Item #B6 of this Technical Review Memo (see below) in any new REMMP.

**6. Part I, Item #1e**

***“Monitoring under Fisheries Authorizations, NWB License Compliance Monitoring, Environmental Effects Monitoring, and Groundwater Monitoring.”***

- The individual monitoring plans address monitoring under Fisheries Authorizations, NWB License compliance monitoring, Environmental Effects Monitoring, and groundwater quality monitoring as required by this

license condition. However, INAC recommends that the Board require AEM to include a comprehensive summary table that references where all license monitoring requirements are addressed (or indicate where these details are included in their AEMP submission) in any new REMMP.

- The following comments and recommendations are specific to each monitoring plan included in Section 3 of the revised AEMP:
  - August 2008 Water Quality and Flow Monitoring Plan
    - The NWB distributed this Plan to interested parties on Sep. 4/08. An INAC Technical Review Memorandum was submitted on Oct. 17/08. The NWB subsequently provided a letter of approval, with conditions to AEM on Mar. 6/09. According to the revised AEMP cover letter, AEM will update this Plan to incorporate regulator comments and submit a revised version to the Board for approval.
  - March 2009 Groundwater Monitoring Plan
    - AEM has revised their Aug. 8/08 Plan to include a discussion on the 2008 groundwater monitoring well installations. In total there are three (3) wells, one at the southeast portion of what will be the Goose Island Pit (installed 2003) and two along the East Dike (installed in 2008). Seven (7) wells were installed in 2003 and 2006, of which six (6) are no longer operational due to frost-induced damage. It is noted that License Schedule 1, Table 2 requires annual monitoring of groundwater wells (locations to be determined) for parameters identified in Group 3 of License Schedule 1, Table 1.
    - This Plan states that “following the recommendations of our external groundwater consultants, the installation of a fourth groundwater well under the tailings basin has been postponed until 2010. As the actual performance of the groundwater well installed in 2008 is unknown at this time, particularly under winter conditions, it was recommended to postpone the installation of any additional wells until the performance of the individual components of the 2008 wells are evaluated.”
    - INAC recommends that AEM be required to revise their Plan to discuss all areas that will be included in their groundwater monitoring program, keeping in mind that the intent of this Plan is “to predict the future quality of water that will accumulate in pits during operation and determine baseline groundwater quality underneath the tailings storage facility before tailings storage

deposition.” It is unknown whether AEM intends to install groundwater monitoring wells in the Portage Rock Storage Facility, Vault Rock Storage Facility, or other areas within the mine footprint that may impact groundwater.

- Section 1.1 of this Plan states that “groundwater monitoring wells have been installed to sample talik water in areas where through taliks exist. No groundwater monitoring wells will be installed at the Vault Deposit, as the Vault Pit will be developed in an area where the talik does not extend down through the permafrost.” INAC recommends that AEM be required to further discuss their reasoning for not carrying out groundwater monitoring in this area through an analysis of all known information that was used to make this determination, particularly thermistor trend analyses.
  - This Plan should be revised to include a map or diagram that references all groundwater monitoring well locations, sampling frequency, monitored parameters, and reporting methods.
- March 2009 Water Quality Monitoring Plan for Dike Construction and Dewatering
    - On Apr. 24/09 AEM submitted a copy of this revised Plan to the NWB for approval as required by Part D, Item #11 of their license. INAC received a copy of this Plan and prepared a separate Technical Review Memorandum providing comments and recommendations for the Board’s consideration. Please see attached.
  - January 2009 Quality Assurance / Quality Control Plan
    - INAC has reviewed the submitted Plan and is not opposed to its implementation.