Department of Indian and Northern Development (INAC)
Written Intervention
for the
Nunavut Water Board Hearing
on
Type A Water License Application 2AM-MEA
for the
Meadowbank Gold Project
by
Agnico-Eagle Mines Limited

April 15-17, 2008
in
Baker Lake Nunavut

March 2008

EXECUTIVE SUMMARY

Department of Indian Affairs and Northern Development's (INAC's) review of Agnico-Eagle Mines Ltd.'s (AEM's) Type A licence application for the Meadowbank Gold Project is focused on those issues within its mandate, namely, surface and permafrost disturbance, water quality and quantity assessment, waste management, and abandonment and reclamation cost estimates.

The concerns identified by INAC throughout the technical review of AEM's licence application have been reviewed and discussed through technical communications that include AEM's February 2008 Water Licence Technical Meeting, Information Support Documents and subsequent information submissions. This intervention will discuss those components of the Meadowbank Gold Project that are within INAC's mandate and provide recommendations for the Nunavut Water Board's (NWB's) consideration through the water licence application hearing process to assist the Board when writing licence terms and conditions.

INAC Recommendations

INAC recommends that the NWB Water Licence require AEM to report on certain matters related to management of its proposed Meadowbank Gold Project. The primary issues of concern are:
(a) Monitoring the geotechnical/permafrost stability of project structures,
(b) Monitoring the water balance and water quality model,
(c) Geochemical monitoring,
(d) Waste rock management,
(e) Wastewater management,
(f) Solid waste management, and
(g) Closure and reclamation conditions.

Further discussion on these issues is provided below.

(a) Monitoring the Geotechnical/Permafrost Stability of Waste, Water and Tailings Retention Structures

The provision of as-built topographic survey, together with thermal/deformation /seepage instrumentation monitoring results and comparison of these results with a predicted performance at time of licence issue is required. Site inspection program results should be provided to the NWB on a regular basis in accordance with the timeframes discussed herein.

Final design drawings for project structures are required, especially for any designs changed in advance of construction. INAC recommends that additional geotechnical investigations of foundations conditions be a requirement for any retention structure where the loss of contained fluids/materials would negatively influence water quality. For such structures, a comprehensive geothermal analysis should also be completed for

any designs where permafrost becomes a design component necessary for adequate performance of the structure and/or where either freezing or freeze-thaw could be a detracting feature of the design.

(b) Monitoring of the Water Balance/Water Quality Model

AEM has developed a water balance/water quality model to manage the discharge of water within the tailings containment area. This model is designed to ensure that the quality of discharged water will not exceed Metal Mining Effluent Regulations criteria and that the Canadian Council of Ministers of the Environment water quality guidelines for the protection of freshwater aquatic life are met. INAC recommends that AEM collect climate and hydrological data as part of its ongoing monitoring program and incorporate collected data into the water balance/water quality model. INAC recommends that AEM be required to submit a water balance and water quality modelling report every three (3) months for the initial two (2) years of mine operation. The model would be re-calibrated as necessary at the end of each three (3) month period. This will allow for confidence in the water quality modelling results and the eventual release of water. Following the two (2) years of mine operations, water balance and quality monitoring can become an annual occurrence.

(c) Geochemical Monitoring

INAC recommends that a Geochemical Monitoring and Waste Rock Storage Report be provided to the NWB on an annual basis. This report would present and interpret data associated with tailings solids, tailings supernatant, cyanide leach residue, bleed from the cyanide destruction process, and waste rock. This report is needed to assess the quality and quantity of leachate produced within the project area and to determine its effects on the receiving environment.

(d) Waste Rock Management

AEM plans on depositing waste rock in several areas during construction of project infrastructure (e.g., roads, building pads, waste rock facility and dikes/dams). INAC recommends that AEM identify all waste rock by general lithology and location relative to its placement. This will allow for AEM and the NWB to understand the type of waste rock and provide a basis for investigating the cause of acid rock drainage should this occur.

Non-acid generating waste rock material will be placed as a cover over the waste rock facility and tailings storage facility. The appropriate thickness to protect the environment will be tested during operations and an annual report of results should be submitted to the NWB for review.

(e) Wastewater Management

AEM has identified plans to provide for sewage treatment and sludge disposal throughout the life of the plant from the construction stage through the operations and demolition stages. Proposed sewage plant information has been provided that demonstrates AEM’s commitment to providing effluent treatment prior to release. AEM

should, however, revisit the sewage treatment plant treatment capabilities with the goal of providing an effluent quality that meets the Industrial Waste Discharge criteria.

(f) Solid Waste Management

AEM have provided plans that demonstrate proposals to provide landfill, landfarm and incineration of wastes through the project life. The landfill proposals address pre-construction, construction, operation and closure landfill needs. As a follow-up to these plans, AEM will need to address ongoing changes to practices and policies demonstrating activities to divert waste from the waste stream and ongoing monitoring of landfilled wastes. In addition, AEM has identified proposed incineration for putrescible (liable to decay or spoil or become putrid) and sewage sludge wastes. As the incinerator proposed is an off the shelf unit, AEM should provide manufacturer test documentation together with detailed plans and construction specifications attesting to emission capabilities compared to Canada Wide Stabdards for municipal waste incineration. Monitoring of liquid seepage, sump liquids and ash should also be included in the licence.

(g) Closure and Reclamation Conditions

Given the relatively short life of the Meadowbank Gold Project, INAC recommends that AEM submit an Interim Mine Closure and Reclamation Plan not later than six (6) months after the start of mining and a Final Mine Closure and Reclamation Plan no later than twelve (12) months before the expected end of mining to the NWB for review and approval. Both the Interim and Final Plans are to incorporate revisions that reflect the ongoing status of mine development.

INAC estimated the potential abandonment and reclamation cost for the Meadowbank at the end of Year 1, Year 5 and mine life before closure begins. The cost of reclamation at the end of mine life is estimated as approximately $43.8 million.

Conclusion

INAC appreciates the cooperation that AEM has provided throughout the environmental assessment and regulatory review of the Meadowbank Gold Project. The Department is confident that the concerns brought forward by all interveners will be fully addressed by the Nunavut Water Board at the upcoming Final Hearing from April 15 to 18, 2008 in Baker Lake, Nunavut. INAC looks forward to participating in these hearings.

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INTRODUCTION

Agnico-Eagle Mines Ltd. (AEM) applied for a Type A licence to permit the use of water and disposal of waste material into water associated with the development of its Meadowbank Gold Project, an open pit gold mine. The Meadowbank Gold Project is situated on the mainland of Nunavut's Kivalliq region, at the general UTM coordinates of 721400 N and 638000 E, near latitude 65 N and longitude 96 W. The nearest communities to this project include the hamlets of Baker Lake, 70 km to the south; Chesterfield Inlet, 300 km to the southeast; and Rankin Inlet, 305 km south-southeast. The Meadowbank Gold Project is expected to be in operation for ten (10) years. A total of 330,000 ounces of gold per year is anticipated to be recovered at a rate of 8,500 tonnes per day (tpd) of ore. Mine development is scheduled to start in the second half of 2008. Production mining is anticipated to begin in the first quarter of 2010 through to the end of 2018. Potential exists to expand the mine life.

The Department of Indian Affairs and Northern Development (INAC) participated in the Nunavut Impact Review Board's environmental assessment of this project as per Article 12, Part 5 of the Nunavut Land Claims Agreement and will continue to be actively involved in this project's regulatory approval and operation due to the department's responsibilities under the Nunavut Waters and Nunavut Surface Rights Tribunal Act and the Department of Indian Affairs and Northern Development Act. INAC will inspect the site and enforce the terms and conditions of the water licence issued by the Nunavut Water Board and approved by the Minister responsible for the Department of Indian Affairs and Northern Development.

LICENCE APPLICATION REVIEW

Agnico Eagle's water licence application was received on September 24, 2007 by the Nunavut Water Board. The NWB acknowledged receipt and requested additional documents and clarification following the review by interested parties for completeness of the application. The additional supplemental information was submitted by Agnico-Eagle Mines Limited (AEM) on December 4, 2007. The NWB also received copies of letters from the Nunavut Impact Review Board (NIRB) dated November 23, 2007 and November 27, 2007 that NIRB Project Certificate Condition No. 8 and 17 do not require amendment and the NWB could continue the water license application review process.

The INAC Technical Team reviewed the Type "A" water licence application and supporting documentation from Agnico-Eagle Mines Limited (formerly Cumberland Resources Ltd) for its Meadowbank Project. The team initially provided a determination of the completeness of the application, including identification of deficiencies on November 2, 2007. INAC attended and provided input at the Technical Meeting and Pre-hearing Conference (PHC) held by the NWB in Baker Lake during the week of February 25, 2008. The NWB issued a pre-hearing conference decision and gave notice pursuant to section 55(2) of the *Waters Act* that a Public Hearing will be held in Baker Lake on April 15, 2008 commencing at 9:00 a.m.

INAC retained EBA Engineering Consultants and Brodie Consulting Ltd. to provide additional technical support and advice in hydrological, hydrogeological, geotechnical, permafrost and geochemistry (ARD) areas to address issues related to:
• Mine/Quarry Design and Construction;
• Mine/Quarry Closure and Risk Assessment;
• Potential Acid Rock Drainage and Metal Leaching;
• Abandonment and Restoration of the Mine Site;
• Geotechnical engineering and permafrost issues, including stability of the dikes, dike foundations and pit walls;
• Permafrost engineering and related issues;
• Hydrogeology and hydrology (including water quality and water balance);
• Wastewater treatment technologies; and
• Hazardous materials handling.

INAC has and will continue to cooperate with other interveners including our federal partners on the assessment of water quality/quantity issues of concern.

PART A: SCOPE, DEFINITIONS AND ENFORCEMENT

Presently, INAC has not identified any recommendations associated with this component of the licence.

PART B: GENERAL CONDITIONS

Annual Reporting Related to Geotechnical / Permafrost Aspects

Comments/Rationale
Adequate performance of the dewatering dikes, dams, waste rock piles; tailings storage facility, landfills and most other earthworks outside and inside the open pit rely on adequate geotechnical design by parties knowledgeable of the unique cold climate challenges for the respective region. Geotechnical and geothermal aspects of the design are related to short term seasonal changes and long term trends of permafrost aggradation and degradation.

Recommendations
At a minimum, for all dewatering dikes, dams, waste rock facility and pit walls (main facilities) INAC recommends that the following geotechnical/permafrost aspects associated with the proposed project be reported upon annually (on March 31). The purpose of the annual report is to state for each development:

- The methods used for monitoring deformations, seepage and geothermal responses;
- Frequency of measurement of deformations, seepage and geothermal responses;
- Either provide a comparison with predicted behaviour from the time of Water License Application or explain why the predicted behaviour is not monitored;
- Any changes in the design and/or as-built condition and respective consequences of any changes to safety, water balance and water quality;

- For each difference between as-built and time of Water Licence design, provide commentary on the associated changes in risk; and
- The mitigative measures implemented to reduce the risk to levels acceptable in the industry.

NWB should stipulate that AEM shall develop a protocol for distinguishing seepage through facilities and report seepage observations according to the following schedule:

Table B.1: Minimum Observation frequencies	
Characterization of seepage including: precise location; discharge rates and volumes; respective hazard(s) and consequences and prescribed mitigative measure	Minimum Frequency of Observation
Lake water Seepage Through Dewatering Dikes	Monthly
Seepage (of any kind) Through Central Dike	Monthly
Seepage and Runoff from Landfill	Quarterly
Subsurface Seepage and Surface Runoff from Waste Rock Pile	Quarterly
Seepage at Pit Wall and Pit Wall Freeze/Thaw and Permafrost Aggradation	Quarterly

Proactive as well as reactive mitigation works will be undertaken by AEM to prevent environmental damage. The application documents have provided measures for mitigating seepage. The selection of the appropriate measures will be made by a geotechnical engineer depending on actual site conditions. As-built drawings of all mitigation works undertaken should be included as part of the Annual Report. Geotechnical instrumentation installed by AEM will be monitored to assess the performance of all major facilities. In addition, any existing instrumentation, such as thermistors, installed at other locations will be monitored for specific purposes. The data collected from all instruments should be included as part of the Annual Report. The interpretation of this data should be summarized as part of the Annual Report. INAC recommends that the Nunavut Water Board (NWB) will require AEM submit a record of ongoing maintenance due to settlement and deformations related to dikes and dams in their annual report. Prior to the annual inspections, AEM should commit to undertake aggressive monitoring to confirm settlement behaviour.

At the Baker Lake Facilities, confirmation is required that the as-built drawings and bathymetric surveys conducted prior to shipping in 2007, were submitted to the appropriate regulatory authorities, including the INAC Land Administration.

The Annual Report should also include, but not necessarily be limited to, the following:

- The monthly and annual quantities in cubic metres of seepage from major dikes/dams;
- Summary of the maintenance work pertaining to the Baker Lake facilities, including the annual bathymetric surveys conducted prior to each year of shipping;
- Report significant changes to the preliminary mine closure and reclamation plan;

- A Geotechnical Site Report completed by an independent review panel on all main facilities; and
- A summary report with results of ongoing waste rock characterization and placement with test results related to potential acid generating (PAG)/net acid generating (NAG) waste and effective capping thicknesses for environmental protection.

Annual Water Balance / Water Quality Model Reporting

AEM has developed a water balance/water quality model to manage the discharge of water within the tailings containment area. This model is designed to ensure that the quality of discharged water will not exceed Metal Mining Effluent Regulations criteria and meet the Canadian Council of Ministers of the Environment water quality guidelines for the protection of freshwater aquatic life. INAC understands that AEM will collect climate and hydrological data as part of its ongoing monitoring program. INAC recommends that AEM be required to submit a water balance and water quality modelling report every three (3) months for the initial two (2) years of mine operation. The model would be re-calibrated as necessary at the end of each three (3) month period. This will allow for confidence in the water quality modelling results and the eventual release of water. Following the two (2) years of mine operations, water balance and quality monitoring can become an annual occurrence.

Annual Reporting of Geochemical Monitoring

Annual reporting of geochemical monitoring data will be required by AEM. This data should include but not limited to:

- Operational Acid Base Accounting (ABA) and paste pH test work used for waste rock designation (PAG or NAG).
- As-built volumetrics of waste rock used in construction and sent to the waste rock facility with estimated NNP and metal toxicity.
- All monitoring data with respect to geochemical analysis on site and related to road quarries and permanent access road.
- Leaching observations and tests on pit slope and dike exposures.
- All water quality data (geochemical or otherwise) with respective locations that has been collected during a given year.
- Reporting of any significant environmental impact observed by geochemical monitoring should be reported within 7 days of the observation.

PART C: CONDITIONS APPLYING TO SECURITY

INAC hired Brodie Consulting Limited to estimate the potential abandonment and reclamation cost for the Meadowbank at the end of Year 1, at end of Year 5 and at end of mine life before closure begins. The calculations of the reclamation costs are attached to this intervention and Table 1 is reproduced below. The total reclamation costs at the end of mine life is estimated as approximately $43.8 million.

Table 1

Summary of Estimate Reclamation Liability for the Meadowbank Mine

RECLAMATION COST ESTIMATE

Period	Total Reclamation Liability	Land-Related Reclamation Liability	Water Related Reclamation Liability
End of Year 1	$16,218,000	$8,593,000	$7,625,000
End of Year 5	$26,105,000	$10,264,000	$15,841,000
End of mine life	$43,875,000	$14,790,000	$29,084,000

Exact Amounts & Break-down provided in Appendix C, Meadowbank Gold Project prepared for Water Resources Division, Indian & Northern Affairs Canada, Iqaluit, Nunavut X0A 0H0, by Brodie Consulting Ltd.

INAC already holds land-related security under its land leases for the portions of the all-weather road located on Crown land. INAC assumes that the Kivalliq Inuit Association holds reclamation security under the KIA leases for portions of the road on Inuit Owned Land. The Baker Lake lay-down area is on Municipal land and/or Commissioner's land and a majority of the reclamation issues would be land related, therefore security should be held by the Hamlet or the Government of Nunavut. INAC will continue to consult with AEM, the Kivalliq Inuit Association and the Government of Nunavut on estimated reclamation costs for all parts of the project.

PART D: CONDITIONS APPLYING TO CONSTRUCTION

Construction of Facilities Related to Water Use

Table D.1 provides timetables for submissions to the Board for specific and non-specific structures related to water use.

Table D.1: Submission Time Table		
	Included in NWB Approved Management Plan	Not Part of NWB Approved Management Plan
Dams and Dikes	10 days	6 months
Waste Disposal	10 days	45 days
Any Other Facility Related to Water Use	10 days	45 days
Sumps	Excluded	excluded

All submissions by the Licensee, whether in the Board Approved Management Plan or not shall include following information:

- A description of the facilities to be constructed;
- The proposed location of the structure(s);
- Any potential impacts to the aquatic environment;
- A description of any monitoring, including but not limited to, sampling locations, parameters measured and frequencies of sampling to be carried out to determine impacts to the aquatic environment;
- Schedule for construction; and
- Drawings of engineered structures stamped by a Professional Engineer.

AEM should ensure that construction of engineered structures will be supervised by a Professional Engineer. AEM should submit to the Board, within 90 days of completion of any construction of engineered structures related to water use or waste disposal, excluding the construction of sumps, all as-built drawings, documentation of field decisions that deviate from original plans and any data used to support these decisions.

Construction - Quarry Rock Monitoring and Management

Rock quarries for road construction aggregate have already been excavated during all weather road construction. AEM has a reclamation and monitoring plan in place. Mitigation measures for environmental impacts have been proposed by AEM. INAC recommends that AEM submits their plan for mitigation measures to the Board by the fall of 2008.

Baker Lake Facility

INAC recommends that all as-built drawings of the Baker Lake facilities should be submitted to the NWB with the annual report.

All Weather Access Roads

The all weather access road has been constructed. As-built drawings will be provided to the NWB for with the next annual report.

PART E: CONDITIONS APPLYING TO WATER MANAGEMENT

Water Management Plan with Respect to Water Quality

Comments/Rationale
In response to a NWB request (February 26 and 27, 2008), AEM provided supplemental information (March 6, 2008) related to the Water Quality and Flow Monitoring Plan. The supplemental information included a summary table to clarify the proposed monitoring program and highlighted a revision to the proposed schedule of monitored parameters for non-contact water.

Recommendations
INAC recommends that the Water Licence stipulate that, throughout mine operation, non-contact water will be tested twice per open water season for parameters, including as a minimum: pH, sulphates, turbidity, metals (copper, lead, nickel and zinc), at proposed Compliance Monitoring Points, acting as protective measures to the receiving environment, to demonstrate that non-contact water has not mixed with water exposed to mining activities.

Aquatic Effects Management Plan

Comments/ Rationale
Many monitoring programs/plans have been identified in the documentation to cover water chemistry and other aquatic effects at a more conceptual level. The overall Aquatic Effects Management Program (AEMP) has identified existing and proposed monitoring locations and agreement to finalize a plan prior to implementation. There are numerous assumptions made in the modelling of long-term conditions, and actual data is required to verify these results and modify operational plans if necessary.

Recommendation
INAC recommends that an AEMP be submitted for review and approval by NWB prior to implementation of the plan and commencement of site works. The plan must specify sampling type, location, parameters, frequency and contingency actions if exceedances occur. It should include use of previous monitoring stations to compare to baseline conditions, background stations and appropriate internal site and compliance discharge locations. It should be flexible to recognize that augmented locations or frequencies may be required where actual results diverge from expected modelled values.

Design Freeboard Criteria.

Comments/Rationale
The top elevation of the shoreline protection measures at the Third Portage Lake diffuser system discharge pipe has been set at 135.0 masl. This elevation is based on a calculated 1:100 year wet spring level of about 134.2 masl plus a freeboard of 0.8 m. We concur with this assessment; however, given the importance of maintaining the integrity of the discharge pipe, complementary monitoring should be carried out.

Recommendations
INAC recommends that regular monitoring inspections (monthly) and maintenance as required be carried out on the shoreline protective works and that water levels in both Second and Third Portage Lakes be monitored during operational stages of the mine.

PART F: CONDITIONS APPLYING TO WASTE MANAGEMENT

Seepage from Toe of Landfill

Comments/Rationale
AEM is committed to a site inspection protocol that includes monitoring source(s) of seepage adjacent to and within the Waste Rock water collection system. Water collected within the sump will be directed to either the attenuation pond or the Reclamation pond.

Recommendation
INAC recommends that the Meadowbank Gold Project's Water Licence contain a condition regarding the monitoring of seepage and sumps around the rock dump specifically focused on monitoring for the development of leachate from the landfill(s). This should include monitoring near the construction landfill and the operations landfill. The demolition landfill will likely be the second operations landfill prior to closure. If this is not the case, additional monitoring locations should be identified by AEM prior to closure activities.

Annual Geotechnical Inspection of Landfills

Comments/Rationale
An annual geotechnical inspection should be completed for all landfill areas including the waste rock facility.

Recommendations
INAC recommends that an annual geotechnical inspection should be completed by an independent qualified engineer. This inspection should determine the as-built geotechnical stability. A report should be submitted to the NWB within 45 days of such inspection.

In consultation with the INAC Inspector, AEM should re-visit the Water Quality and Flow Monitoring Plan to address the location of the proposed compliance and internal monitoring locations as they relate to existing drainage courses beneath the Rock Storage Dumps and Tailing Storage dikes to ensure potential seep locations are adequately identified. Care should be taken to identify surface water runs that butt against the toe of slope for rock fills and include them in the monitoring program.

Construction / Operations Landfill

Comments/Rationale
Material being disposed of in the construction/operations landfill(s) should be placed according to the approved protocols developed by AEM to minimize deformation of cover and frost-heaving of buried materials. The materials placed should be photo-documented and a map produced showing the locations and volumes of the various types of materials. Prior to development of the construction/operations landfill(s), solid waste generated from the exploration and construction camps shall be temporarily stored on site, safe from animal intrusion or hauled to Baker Lake landfill under appropriate conditions.

Recommendations
INAC recommends that AEM provide a protocol for the placement of materials in the construction/operations landfill(s) to minimize settlements, voids, and frost-heaving of buried materials.

An inventory of volumes and photo documentation of materials placed into construction/operations landfill(s), including map showing location of various types of wastes materials should be provide to the NWB as part of the Closure Plan.

Daily, monthly and annual estimates of wastes by waste characterization are to be kept and forwarded annually in an annual report to the NWB. Estimated volumes of sludge from the sewage treatment plant received at the landfill are also to be recorded.

Documentation of waste diversion programs and their effectiveness in minimizing waste deposited to the landfill(s) are also to be recorded and submitted annually.

AEM should provide annual updates to the NWB regarding the waste management practices and waste diversion activities it maintains. AEM should also provide the Board with a copy of the Hamlet of Baker agreement to accept materials in its landfill.

Demolition Landfill

Comments/Rationale
AEM have identified that one of the operational landfill locations are expected to be used for the closure (demolition) site. Material being disposed of in the demolition landfill should be placed according to the approved protocols developed by AEM to minimize deformation of cover and frost-heaving of buried materials. The materials placed should be photo-documented and a map produced showing the locations and volumes of the various types of materials.

Recommendations
INAC recommends that AEM provide a protocol for the placement of materials in the demolition landfill to minimize settlements, voids, and frost-heaving of buried materials. An inventory of volumes, waste characterization and photo documentation of materials placed into demolition landfill, including map showing location of various types of wastes materials should be provide to the NWB as part of the Closure Plan.

Construction/Operation/Closure Discharge Standards

Comments/Rationale
Non-contact water diversions were included as compliance monitoring points within the proposed Water Quality and Flow Monitoring Plan (Document 450 and 626) for the Project. At the Technical Meeting and in “Table 2b: AEM Response to Meadowbank Type A Water Licence Intervener Comment Table”, AEM committed to the inclusion of monitoring of diverted non-contact waters in the Water Licence to assure that all water being released from the Project meets standards to protect the environment. Specifically, additional test parameters were requested. Supplemental information provided by AEM, dated March 6, 2008, included an updated Meadowbank Gold Project Water Quality and Flow Monitoring Plan for Compliance and Internal Monitoring points from construction, early operations and closure. Based on review, an internal point leading from Tear Drop Pond should be added to the sample locations.

Recommendations
The Water Quality and Flow Monitoring Plan should be amended and submitted prior to construction to evaluate the monitoring location for potential seepages based upon actual and topographic intermittent water runs. Pooled water forming at the toe of

slopes may also need to be addressed as well, however not as seeps from the rock dump areas. Similarly, AEM should include internal monitoring for the outlet of Tear Drop Pond based on a Schedule 5 sample suite.

Water quality monitoring for the sump at the landfarm will also need to be carried out when discharge is needed. This should be reported on by activity date and through an annual report.

Incinerator

Comments/Rationale
At the Technical Hearings, AEM advised that the incinerator to be provided for the incineration of organic waste at the site will be an off-the-shelf unit with dual chamber, forced air high temperature incinerator meeting Canada Wide Standards for Dioxins and Furans and Mercury. Only appropriate waste will be disposed of in the incinerator. During construction, STP sludge will also be incinerated.

Recommendations
INAC recommends that AEM inform the Board that the incinerator meets appropriate regulatory requirements. AEM should monitor and maintain records, for review, of intake waste to the incinerator.

AEM should analyze the ash produced from the incineration of organic waste and sludges prior to the disposal of ash in the landfill. Appropriate ash standards such as those used for the disposal of bottom ash from the incineration of municipal wastes should apply.

Stormwater Discharge Standards

Comments/Rationale
AEM propose that non-contact and contact stormwater, be monitored based on a revised supplemental information Meadowbank Gold Project Water Quality and Flow Monitoring Plan submitted March 8, 2008.

Recommendation
INAC recommends that the Water Licence include both maximum grab sample and monthly average concentrations as part of the licence standards based upon the monitoring schedule identified in the Water Quality and Flow Monitoring Plan. (as amended).

Construction/Permanent Sewage Discharge Standards

Comment/Rationale
During the Pre-Development Camp and for the plant operational life, AEM are proposing to develop a rotary biological contactor sewage treatment plant (STP) at the site to support pre-development activities for a 200 person camp. The supplemental information document, dated March 5, 2008, from AEM identifies the proposed STP facility and location. All sewage and greywater from the camp and associated facilities drain to a lift station, then are pumped to a STP equilization tank at the STP site, followed by treatment. Treated flow from the STP flows by gravity to a second pump

station that will pump to Tear Drop Pond. Concentrations from the STP are anticipated to be 100mg/L TSS and 80 mg/L BOD. Tear Drop Pond has been identified as a non-fish bearing lake and is proposed to be used as a stormwater management pond. Overflow discharge effluent from Tear Drop Pon is to be pumped to the north arm of Second Portage Lake once it meets 25 mg/L TSS and 25 mg/L BOD and other parameters. Tear Drop Pond appears to be actually operating as part of the treatment system reducing TSS and BOD to near guideline criteria. Treated effluent levels from the STP and the final effluent levels are sufficiently lower than those recommended in the Environmental Guideline for Industrial Waste Discharges prepared by Department of Sustainable Development Environmental Protection Service Nunavut (January 2002), Schedule II: Standards for Non-point Sources Discharges. This Schedule calls for concentrations not to exceed 15 mg/L TSS and 15 mg/L BOD among other parameters.

Recommendation
INAC recommends that AEM sample and monitor effluent quality from the STP on a daily basis for TSS and BOD and provide adjustments and additions to the STP facility to meet the effluent quality guidelines identified in the Environmental Guidelines for Industrial Waste Discharges (January 2002) Department of Sustainable Development, Environmental Protection Service, Nunavut.

INAC recommends that AEM include in the operations plan for the STP the contingency measures addressed in the March 6, 2008 letter, including identifying potential repairs that would trigger the need for longer duration storage or out of service facilities.

Tear Drop Pond Discharge Standards

Comment/Rationale
As noted above, Tear Drop Pond is proposed to receive stormwater runoff as well as effluent from the STP. The proponent has addressed the potential discharge criteria as being 25 mg/L TSS and 25 mg/L BOD among other parameters. The Nunavut Guidelines for Industrial discharges are notably lower.

Recommendation
INAC recommends that the Meadowbank Project's Water Licence require design information from AEM that demonstrates that the effluent quality leaving the STP will be in the range of 25 mg/L BOD and TSS such that the effluent quality from the Tear Drop Pond will be able to meet the Nunavut industrial effluent guidelines for the parameters found in Schedule II of the Environmental Guideline for Industrial Waste Discharges, as prepared by Department of Sustainable Development, Environmental Protection Service (2002).

PART G: CONDITIONS APPLYING TO WASTE ROCK MANAGEMENT PLANS

Quarry Rock Management

Comments/Rationale
During all-weather road construction, several rock quarries were excavated to provide road aggregate. These cuts and pits remain open to the receiving environment.

Recommendations
INAC recommends that monitoring be required to assess the environmental impacts with respect to quarry pits used for road aggregate. Monitoring should include geochemical testing of runoff and/or seepage from the quarries and visual observations of pit stabilities. All data collected should be included in the annual geochemical report

Quarry Rock Seepage Management

Comments/Rationale
AEM has a reclamation and monitoring plan in place to mitigate seepage from rock quarries.

Recommendation
INAC recommends that all quarries require seepage management using best management practices to protect the environment. This should include ditching, diversions, sumps and berming, where necessary.

Waste Rock Management

Comments/Rationale
AEM will be mining significant waste rock tonnages which will be used for construction and waste dump placement. These waste rocks have been geochemically characterized as having NAG and PAG properties.

Recommendation
Waste Rock Management will be critical in protecting the environment against significant impacts due to potential acid rock drainage. Proper sequencing of NAG and PAG waste in the rock facility will require continual operational management to achieve the proposed plan. INAC recommends that NWB require reporting of the as-built facility on an annual basis which should include plans, sections and volumetrics showing estimated NNP's of placed tonnages.

INAC recommends that test work is required to review the effectiveness of a 2 metre thick NAG waste cover over the waste rock facility for closure purposes. This cover test work also applies to the tailings facility. INAC also recommends that AEM inform the Board annually on the success of freeze-back and depth of the active layer.

Geotechnical stability of the waste rock is critical to environmental protection. A failure can expose PAG waste and impact the geochemical stability of the waste. Continual operational monitoring is required and failures reported in the Annual Geotechnical Report.

Sewage Management

Comment/Rationale
Supplemental report Pre-Development Camp and Sewage Treatment Plant Description for the Meadowbank Project Site, March 5, 2008 provided by AEM provides an update to the STP proposed for the construction and permanent operation of the site. The Operations plan identifies lift stations, STP and ancillary facilities proposed in providing treatment to waste water. Also included is the use of Tear Drop Pond as a receiving water body. This lake also receives stormwater runoff for the site area. The water management and waste water management plans should be amended if the STP together with Tear Drop Pond are intended to provide treatment prior to discharge of effluent waters. This discharge does not currently meet the Industrial Waste Water Discharge criteria. An amendment to the treatment approach will need to be considered.

Recommendation
INAC recommends that AEM review the Pre-Development Camp and Sewage Treatment Plant Description for the Meadowbank Project Site, March 5, 2008 be revised to address the full treatment process to meet the industrial water discharge criteria for Nunavut.

INAC recommends that a condition in the Water Licence address the need to further develop within the management plan Contingency Measures to address operational emergencies and dealing with continuous operations of the camp facilities. This is a follow up from a supplemental letter on the STP dated March 6, 2008.

PART H: CONDITIONS APPLYING TO MODIFICATIONS

As-Built Drawings for Facilities Related to Water Use and Waste Disposal

Comment/Rationale
AEM may, without written approval from the Board, carry out modifications to facilities related to water use and Waste Disposal provided that such modifications are consistent with the terms of the License and the following requirements:

- AEM has notified the Board in writing of such proposed modifications at least 45 days prior to beginning the modifications;
- Such modifications do not place AEM in contravention of either the Licence or the Act;
- The Board has not, during the 45 days following notification of the proposed modification, informed AEM that review of the proposal will require more than 45 days;
- The Board has not rejected the proposed modifications; and
- An Inspector has authorized the modifications.

Recommendation
INAC recommends that modifications for which all of the conditions referred toabove have not been met may be carried out only with written approval from the Board.

AEM should provide to the Board as-built plans and drawings of the modifications referred to above within 90 days of completion of the modifications.

Expansion of Project Beyond Proposed Ten-Year Mine Life or Significant Change in Production Rate

Comments/Rationale
AEM will be continually exploring the Meadowbank Gold Project region for the potential to expand resources with subsequent expansion of mine life and facilities. Ongoing exploration appears to be expanding the current resources of the Meadowbank Project. With this expansion, further reserves may be declared that may expand the mine life beyond the proposed 10 years or increase the production rate significantly.

Recommendation
INAC recommends that, once a new reserve is publicly declared that will increase the mine life or production rate, the NWB will be informed of AEM conceptual plans that may impact the facility. Early planning and communications with respect to expansion will be critical to potentially amending current permits.

Liquid and Solid Waste Facilities and Appurtanences

Comments/Rationale
Although not raised as a technical issue, AEM should produce as-built drawings of the mechanical facilities being provided for the sewage system and incineration processes. This information is usually requested as a Water Licence condition and is included here as a reminder to the NWB for drafting the licence.

Recommendation
The Water Licence should include the requirement for:

- As-built plans for the sewage treatment plant and appurtenances;
- As-built plans for the incinerator and manufacturer's commissioning start-up testing logs;
- As-built plans for the waste oil burner; and
- As-built plans for the hazardous waste compound.

PART I: CONDITIONS APPLYING TO CONTINGENCY PLANNING

Contingent Planning

Comments/Rationale
AEM indicated during the Water Licence Technical Hearing that they would be prepared to consolidate contingency plans for each of the applications they have made for the project site.

Recommendation
INAC recommends a comprehensive contingency plan be developed that encompasses the entire project including mine site, Baker Lake facilities, marine shipping, and surrounding hamlets. This plan should involve the potentially impacted nearby hamlets.

Waste Water Management

Comments/Rationale
The proponent has indicated a willingness for waste water management to be consolidated. The document Pre-Development Camp and Sewage Treatment Plant Description for the Meadowbank Project Site, March 5, 2008, states that a number of contingent steps will be put in place for the eventual maintenance or emergency situations that could arise regarding lift station or STP equipment failure. Emergency or Spill Contingency Plans provided by AEM address fuels or hazardous materials. These items need to be documented in the Contingency Plan and the Operation Plans for the site and STP facilities.

Recommendation
INAC recommends that the Water Licence include a requirement to review the STP process and identify potential maintenance or emergency conditions which would cause the STP facilities to go down and to prepare subsequent alternatives to reduce the risk to the environment.

Solid Waste Management

Comments/Rationale
AEM has provided information concerning the proposed facilities to be used for incineration of solid waste materials. The documentation provided does not address feed material screening, daily operation process, emergency or contingent planning.

Recommendation
INAC recommends that the Water Licence include a condition to have AEM address emergency situations associated with the operation of the incinerator units. This should also include the operation of the waste oil incinerator as well.

PART J: CONDITIONS APPLYING TO GENERAL WATER QUALITY MONITORING

Pit Water Quality Monitoring

Comments/Rationale
Modelled predictions to-date of mine pit water quantity and quality have been evaluated using base case input values for the competent and faulted rock hydraulic conductivities (permeabilities) and a base case profile of groundwater total dissolved solids (TDS) versus depth. Sensitivity (uncertainty) analyses have been conducted to evaluate the potential resultant changes to the base case if the permeabilities and TDS input values were increased by up to three times. The sensitivity analyses concluded that mine water quantity may range between the base case and 40 percent greater and water quality, as measured by TDS concentration, may range between the base case and 50 percent greater.

Continued validation of the mine pit water model is warranted using actual mine pit water data as it becomes available to demonstrate the reliability of mine water balance and water treatment requirements.

Recommendations
INAC recommends that the Water Licence stipulate that the mine pit water quantity and quality model be annually validated and reported to the NWB for each initial year of mine life until the maximum mine depth is attained (expected in year 5). In the event that actual versus predicted quantity and quality values differ by more than 20 percent, it is further recommended that the annual reporting include an implications assessment for life-of-mine water balance and post-closure water treatment requirements.

Stormwater Discharge Monitoring

Comments/Rationale
AEM Meadowbank has developed a water and waste water monitoring plan. A revision to this plan was submitted following the Technical Hearing, February 24 and 25, 2008. Based upon approval of the Water Licence, AEM should review the topography of the areas proposed for rock dumps, landfill and sewage treatment facilities and review intermittent water runs to adjust potential internal and compliance monitoring points to ensure correct positioning.

Recommendation
INAC recommends that the Water Licence include the monitoring of flow during periods of discharge to the environment from the landfarm facility, landfill areas beneath waste rock piles, camp STP and Tear Drop Pond outlets, and area sumps collecting contact surface waters.

Construction Sewage Monitoring

Comment/Rationale
AEM has indicated that the treatment efficiency provided by the STP facility is below industrial waste discharge standards. Although the discharge is to Tear Drop Pond, this pond is intended as a stormwater holding area and not as a component of the sewage treatment system. Monitoring of the treatment efficiencies from the STP on a daily basis and from various sample points should be undertaken to maintain treatment plant discharge water quality to Tear Drop Lake and subsequently to the environment.

Recommendation
INAC recommends that the Water Board include a condition identifying daily and monthly averages for waste water discharge from the STP and from Tear Drop Lake. These should include pH, TSS, BOD, fecal coliforms, and total oil and grease as a minimum.

Post-closure Water Treatment

Comment/Rationale
Unacceptable water quality after closure could come from 3 sources:
1. Some of the rock exposed in the pit walls at closure may leach slightly elevated levels of metals (MMC, Static Test Report, 2005). Dilution during flooding of the pits appears likely to mitigate this issue.
2. In the closure plan, Section 7.1.4, page 7-3, some rock may remain exposed above the ultimate flood elevation in the Portage Pit. If any PAG rock is exposed in this area, the potential exposure area is likely to be small.
3. As noted above, poor quality water could be expelled from the tailings area.

Recommendation
Not all of these issues will lead to a requirement for post-closure water treatment. However, INAC recommends that AEM provide a prediction of the potential contaminant concentrations from each of these 3 sources after closure, and provide an operational monitoring and adaptive management strategy to ensure no post-closure impacts to receiving waters.

PART K: CONDITIONS APPLYING TO GENERAL AND AQUATICS EFFECTS MONITORING PLANS

Quality Assurance / Quality Control Plan

INAC will await the conditions suggested by Environment Canada on Aquatics Effects Monitoring.

PART L: CONDITIONS APPLYING TO CLOSURE AND RECLAMATION

Mine Closure and Reclamation Plan

Comments/Rationale
AEM has provided a Preliminary Mine Closure and Reclamation plan for review. This plan provides general information relating to various mine development stages. A comprehensive plan should be submitted to the NWB that covers key significant areas.

Recommendation
A successful mine closure and reclamation plan will include:

- An interim and final plan developed during operations by AEM;
- Effective capping requirements for waste and tailings as tested during operations;
- Geotechnical and geochemical stability of all mine (on and off-site) facilities;
- Proper disposal of non-hazardous and hazardous materials, salvageable materials during reclamation. No materials will be disposed of in flooded pits; and
- Long-term protection of waters and wildlife.

INAC recommends that AEM submit an Interim Mine Closure and Reclamation Plan not later than six (6) months after the start of mining and a Final Mine Closure and Reclamation Plan no later than twelve (12) months before the expected end of mining to

the NWB for review and approval. Both the Interim and Final Plans are to incorporate revisions that reflect the ongoing status of mine development.

Disposal of Waste Rock

Comments/Rationale
AEM has a preliminary closure plan in place for waste rock.

Recommendation
For final closure, INAC recommends that the waste rock facility be geotechnically and geochemically stable. The capping of the facility needs to be proven to show protection against potential acid rock drainage and metal leaching. Long-term monitoring of this facility should be in place for final closure.

INAC recommends that an independent qualified engineer review and declare waste rock facility geotechnical and geochemical stability before final closure is completed.

Stability of Open Pit Mine Openings

Comments/Rationale
Several open pits will be excavated by AEM during the mine life. Stability of these pits will need to be established before final closure.

Recommendation
INAC recommends that an annual geotechnical inspection be completed by an independent qualified engineer. This inspection should determine the as-built geotechnical stability of the open pits. A report should be submitted to the NWB within 45 days of such inspection.

For final closure, all pits are required to be stable. Final closure should not be declared until an independent qualified engineer has signed-off on pit stability.

Demolition Landfill

Comments/Rationale
AEM has indicated that they intend to use the existing landfill for the deposit of materials not salvageable at the close of the project.

Recommendations
INAC recommends that updated plans for mine closure be submitted for review regarding waste diversion and use of the exiting landfill for disposal of demolition debris.

CONCLUSION

INAC appreciates the cooperation that AEM has provided throughout the environmental assessment and regulatory review of the Meadowbank Gold Project. The Department is confident that the concerns brought forward by all interveners will be fully addressed by the Nunavut Water Board at the upcoming Final Hearing from April 15 to 18, 2008 in Baker Lake, Nunavut. INAC looks forward to participating in these hearings.

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