AGNICO-EAGLE
MEADOWBANK DIVISION

January 29, 2010 *Via Email*

Richard Dwyer
Licensing Administrator
Nunavut Water Board
P.O. Box 119
Gjoa Haven, Nunavut
X0B 1J0

Dear Richard Dwyer

**Re: Water License 2AM-MEA0815 Part F, Item 16 – AEM Response to Comments on Meadowbank Mine Waste Management Plan and Mine Water Management Plan**

This letter is in response to the letter from the Nunavut Water Board dated January 19, 2010, Agnico-Eagle Mines Ltd. – Meadowbank Division (AEM) regarding comments received from parties on the Meadowbank Mine Waste Management Plan and Mine Water Management Plan. The comments focused on three main areas:

- the ammonia management plan;
- the field testing program for closure cover; and
- the protocol for distinguishing seepage though facilities.

The following provides a response for each of these topics. In addition, you will also find in an appendix a detailed response to all of the comments received from Indian and Northern Affairs Canada (INAC), the Department of Fisheries and Oceans (DFO), Environment Canada (EC) and the Government of Nunavut (GN).

**Part F, Item 16 a) Ammonia Management Plan**

AEM is currently implementing best management practices in blasting activities to minimize ammonia and nitrate loading to site contact water. As described in the Mine Water Management Plan, all contact water will be collected and directed to water management facilities on site. This water will be monitored and , if required, treated before release to the environment in accordance with the water quality guidelines listed in the Water License 2AM-MEA0815. Details of the water quality monitoring program and parameters, including ammonia and nitrate, are provided in the *Meadowbank Gold Project Water Quality and Flow Monitoring Plan Version 2*, dated May 2009.

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A detailed Ammonia Management Plan specific to the Meadowbank site is under development and will be submitted for approval by April 30, 2010 as an Addendum to the current Mine Water Management Plan. The approved plan will be included in future versions of the Mine Water Management Plan

**Part F, Item 16 c) Field testing program for cover closure depths**

The field testing program for cover closure thickness for the Tailings Storage Facility (TSF) and Waste Rock Storage Facility (RSF), taking into account the effect of climate change, will consist of a number of inter-related monitoring and testing activities. These activities will be implemented in a phased approach integrated with the existing tailings and waste rock deposition plans. These monitoring and testing activities will include:

- thermal monitoring of tailings and waste rock freeze back;
- seepage water quality monitoring; and
- tailings cover trials.

The freeze control strategy is an important part of the tailings and waste rock management on site. For that reason, AEM is committed to developing a Thermal Monitoring Plan (TMP) for monitoring freeze back within the Tailings Storage Facility and the Portage Waste Rock Facility. This TMP is currently under development and will be included in future versions of the Mine Waste Management Plan.

The data on thermal response will form the basis for future thermal modeling and ongoing management of the facilities through operations, and into closure and post-closure (including required closure cover depths). Thermal monitoring installations will be placed within and surrounding the TSF, situated in a manner that will document freeze back within and below the TSF, in the foundation of the Stormwater Dike, and in the foundations of the TSF perimeter structures including the Central Dike. The control strategy to minimize the onset of oxidation and the subsequent generation of acid rock drainage within the RSF includes freeze control of the waste rock through permafrost encapsulation. Based on thermal modeling completed at the EIS stage of the Project, it is expected that the material within the RSF will freeze within two years of placement. In order to monitor the actual rate of permafrost encapsulation, monitoring installations will be placed within the RSF as part of the TMP.

Details of the seepage water quality monitoring program are provided in the *Meadowbank Gold Project Water Quality and Flow Monitoring Plan Version 2*, dated May 2009. Future versions of the Mine Waste Management Plan will include a reference to this document.

Details on the tailings cover trials have yet to be developed. It should be noted however, that active tailings deposition will be ongoing within the north cell of the TSF for the first three to four years of mine life, and therefore the feasibility of completing such trials will be limited during this

time. It is currently envisioned that tailings cover trials will commence in the north cell once tailings deposition switches to the south cell. Future versions of the Mine Waste Management Plan will include details of the tailings cover trials once prepared.

**Part F, Item 16 d) Protocol for distinguishing Seepage through facilities**

Water License 2AM-MEA0815 Part F Item 16 d) refers to *a protocol for distinguishing Seepage through facilities*. This item was included in the License based on the following EC recommendation (excerpted from the Water License 2AM-MEA0815 Reasons For Decision document dated June 9, 2008):

*Waste Rock and Tailings Cover:*

*The Board agrees with EC that the management of tailings and waste rock from the mine is critical to the long term impact of the Project. As discussed by EC, a key component to this is the establishment of a waste rock segregation protocol and routine audit to confirm that the rules for segregating rock are working. The Board agrees this is essential to ensuring that rock that is potentially acid generating or metal leaching is properly disposed of, and that cover rock is effective. The Board also agrees with EC that till rock should be characterized to determine if it will generate acid rock drainage. Accordingly, the Board requires AEM to submit to the Board for review and approval within 6 months of the License approval, a revised Mine Waste and Water Management Plan that includes a protocol for segregating rock, confirming the segregation rules, monitoring till rock for acid drainage potential, and a protocol for distinguishing seepage through facilities.*

After discussion with EC, EC's mining expert, Glenn Groskopf confirmed the intent was to look at the quality of drainage coming from waste rock piles. Waste rock in the waste rock pile is segregated based on the potential for acid generation, as described in the *Operational ARD-ML Sampling and Testing Plan, Version 1* dated August 2008.

The ARD Plan mentions (page 29) that monitoring details are covered in other plans (Water Quality and Flow Monitoring Plan; Meadowbank Project Monitoring Plan). Details of the seepage monitoring program, including locations of proposed seepage monitoring locations, are provided in the *Meadowbank Gold Project Water Quality and Flow Monitoring Plan Version 2*, dated May 2009 (3.1.2.6 on page 32) as required for License monitoring (Part I Sections 8 & 15). The current seepage monitoring program mentioned above addresses the requirement of Part F, Item16 d).

Future versions of the Mine Waste Management Plan will include a reference to the document *Meadowbank Gold Project Water Quality and Flow Monitoring Plan Version 2*, dated May 2009.

Should you have any questions or concerns regarding our request, please contact the undersigned.

Regards,

**Agnico-Eagle Mines Limited – Meadowbank Division**

Stéphane Robert
Environment Superintendent

cc : Lou-Ann Cornacchio, INAC
David Abernethy, INAC
Dave Balint, DFO
Anne Wilson, EC
Allison Loder, GN

## Response to All Comments on Meadowbank Mine Waste Management Plan and Mine Water Management Plan

Indian and Northern Affairs Canada

*Comment INAC-1:*

*Neither of the submitted plans include a detailed Ammonia Management Plan as required by License condition Part F, Item #16 (a). AEM must ensure that this plan be submitted for approval in a revised Mine Waste Management Plan;*

Response INAC-1:

AEM is currently implementing best management practices in blasting activities to minimize ammonia and nitrate loading to site contact water. As described in the Mine Water Management Plan, all contact water will be collected and directed to water management facilities on site. This water will be monitored and, if required, treated before release to the environment in accordance with the water quality guidelines listed in Water License 2AM-MEA0815. Details of the water quality monitoring program and parameters, including ammonia and nitrate, are provided in the *Meadowbank Gold Project Water Quality and Flow Monitoring Plan Version 2*, dated May 2009.

A detailed Ammonia Management Plan specific to the Meadowbank site is under development and will be submitted for approval by April 30, 2010 as an Addendum to the current Mine Water Management Plan. The approved plan will be included in future versions of the Mine Water Management Plan.

*Comment INAC-2:*

*The submitted plans appear to integrate the July 2008 Waste Rock and Water Management Plan that was submitted pursuant to Part D, Item #1 of Water License #8BC-TEH0809 with the exception of water management practices for access road and quarry maintenance. AEM must ensure that these topics are addressed in a revised Water Management Plan. The Meadowbank Gold Project Water License #8BC-TEH809 Monitoring Plan should be referenced.*

Response INAC-2:

Future versions of the Mine Waste Management Plan will incorporate the details concerning water management for the access road and quarries presented in the July 2008 plan submitted pursuant to Part D, Item #1 of Water License #8BC-TEH0809. Reference to this document will also be provided (see also INAC-5).

*Comment INAC-3:*

*A "field testing program for closure cover depth of the Tailings Storage Facility and Waste Rock Storage Facilities with consideration for climate change" has not been provided as required by License condition Part F, Item #16 (c). Anticipated cover thicknesses for the Tailings Storage Facility and the Portage Rock Storage Facility are provided and reference is made to thermal monitoring and cover trials at the Tailings Storage Facility. INAC recommends that AEM be required to submit a revised Mine Waste Management Plan that includes a detailed field testing program once it has been developed;*

Response INAC-3:

The field testing program for cover closure thickness for the Tailings Storage Facility (TSF) and Waste Rock Storage Facility (RSF), taking into account the effect of climate change, will consist of a number of inter-related monitoring and testing activities. These activities will be implemented in a phased approach integrated with the existing tailings and waste rock deposition plans. These monitoring and testing activities will include:

- thermal monitoring of tailings and waste rock freeze back;
- seepage water quality monitoring; and
- tailings cover trials.

The freeze control strategy is an important part of the tailings and waste rock management. For this reason, AEM is committed to developing a Thermal Monitoring Plan (TMP) for monitoring freeze back within the Tailings Storage Facility and the Portage Waste Rock Facility. This TMP is currently under development and will be included in future versions of the Mine Waste Management Plan.

The data on thermal response will form the basis for future thermal modeling and ongoing management of the facilities through operations, and into closure and post-closure (including required closure cover depths). Thermal monitoring installations will be placed within and surrounding the TSF, situated in a manner that will document freeze back within and below the TSF, in the foundation of the Stormwater Dike, and in the foundations of the TSF perimeter structures including the Central Dike. The control strategy to minimize the onset of oxidation and the subsequent generation of acid rock drainage within the RSF includes freeze control of the waste rock through permafrost encapsulation. Based on thermal modeling completed at the EIS stage of the Project, it is expected that the material within the RSF will freeze within two years of placement. In order to monitor the actual rate of permafrost encapsulation, monitoring installations will be placed within the RSF as part of the TMP.

Details of the seepage water quality monitoring program are provided in the *Meadowbank Gold Project Water Quality and Flow Monitoring Plan Version 2*, dated May 2009. Future versions of the Mine Waste Management Plan will include a reference to this document.

Details on the tailings cover trials have yet to be developed. It should be noted however, that active tailings deposition will be ongoing within the north cell of the TSF for the first three to four years of mine life, and therefore the feasibility of completing such trials will be limited during this time. It is currently envisioned that tailings cover trials will commence in the north cell once tailings deposition switches to the south cell. Future versions of the Mine Waste Management Plan will include details of the tailings cover trials once prepared.

*Comment INAC-4:*

*A protocol for distinguishing seepage through facilities has not been provided as required by License condition Part F, Item #16 (d). AEM must revise this plan to include a protocol that complements their May 2009 Water Quality Flow and Monitoring Plan and the Part I, Item #8 and 15 License conditions (they address seepage monitoring). Furthermore, the locations of all proposed (i.e., Table 2 of License, ST-S-1 to TBD) and internal monitoring locations must be referenced in a diagram/schematic;*

Response INAC-4:

Water License 2AM-MEA0815 Part F Item 16 d) refers to *a protocol for distinguishing Seepage through facilities*. This item was included in the License based on the following EC recommendation (excerpted from the Water License 2AM-MEA0815 Reasons For Decision document dated June 9, 2008):

*Waste Rock and Tailings Cover:*

*The Board agrees with EC that the management of tailings and waste rock from the mine is critical to the long term impact of the Project. As discussed by EC, a key component to this is the establishment of a waste rock segregation protocol and routine audit to confirm that the rules for segregating rock are working. The Board agrees this is essential to ensuring that rock that is potentially acid generating or metal leaching is properly disposed of, and that cover rock is effective. The Board also agrees with EC that till rock should be characterized to determine if it will generate acid rock drainage. Accordingly, the Board requires AEM to submit to the Board for review and approval within 6 months of the License approval, a revised Mine Waste and Water Management Plan that includes a protocol for segregating rock, confirming the segregation rules, monitoring till rock for acid drainage potential, and a protocol for distinguishing seepage through facilities.*

After discussion with EC, EC's mining expert, Glenn Groskopf confirmed the intent was to look at the quality of drainage coming from waste rock piles. Waste rock in the waste rock pile is

segregated based on the potential for acid generation, as described in the *Operational ARD-ML Sampling and Testing Plan, Version 1* dated August 2008.

The ARD Plan mentions (page 29) that monitoring details are covered in other plans (Water Quality and Flow Monitoring Plan; Meadowbank Project Monitoring Plan). Details of the seepage monitoring program, including locations of proposed seepage monitoring locations, are provided in the *Meadowbank Gold Project Water Quality and Flow Monitoring Plan Version 2*, dated May 2009 (3.1.2.6 on page 32) as required for License monitoring (Part I Sections 8 & 15). The current seepage monitoring program mentioned above addresses the requirement of Part F, Item 16 d).

Future versions of the Mine Waste Management Plan will include a reference to the document *Meadowbank Gold Project Water Quality and Flow Monitoring Plan Version 2*, dated May 2009.

*Comment INAC-5:*

*The submitted Updated Water Management and Mine Waste Management Plans cannot be reviewed in isolation from other plans submitted pursuant to Water Licenses #2AM-MEA0815 and #8BC-TEH0809. INAC recommends that AEM reference all applicable plans in future revisions to these plans;*

Response INAC-5:

Future versions of the Mine Waste and Mine Water management plans will include reference to all relevant plans prepared under a separate cover.

Department of Fisheries and Oceans

*Comment DFO-1:*

*It is mentioned that there are some updates to the Plans, but it is difficult to identify where the changes are noted. A separate summary section should be provided in Updated Plans to highlight the changes;*

Response DFO-1:

Future versions of the Mine Waste and Mine Water Management Plans will include a separate summary section highlighting updates completed since the previous version of each plan.

*Comment DFO-2:*

*A number of contingency options related to TSS Management are presented on page 3-25 but all are deemed to be not feasible or preferred. The Management Plan should be describing what management actions will occur should there be TSS issues.*

Response DFO-2:

The options presented on page 3-25 of the Mine Water Management Plan are contingencies that may be considered, where feasible, should the TSS treatment system (the preferred option) not function as intended during dewatering. The preferred contingency option, and the TSS management decisions and actions taken will be dependent upon the specific circumstances at the time. Experience on site to date has indicated that the Actiflo treatment system is effective in reducing TSS and turbidity levels in dewatering discharges.

*Comment DFO-3:*

*Concern is identified that metals in fine clays and silts are likely to be mobilized during re-flooding of the pit areas. Although it is stated that these materials will settle in time, this disturbance could result in impacts to biota for a significant time period. In addition, some of the additional terrestrial areas could also release mercury when flooded. It is recommended that some of these materials should be tested for metals before re-flooding to determine if they should be removed.*

Response DFO-3:

Experience with hydroelectric developments has shown that flooding of terrestrial areas during reservoir construction and operation can lead to elevated mercury concentrations in aquatic environments under certain circumstances (i.e., typically the flooding of shallow areas with organic rich terrestrial habitats with highly available carbon sources). These conditions are not

expected at Meadowbank; shallow soils (and their associated organic material) will be stripped off during the mining process, leaving inorganic materials behind that are not expected to promote significant mercury methylation. Consequently, increased bioaccumulation of mercury by biota is not expected.

As described in the Mine Water Management Plan and during the Environmental Impact Review and Type-A Water License processes for the Project, re-flooding of the pits will occur in a controlled fashion over several years. Following completion of flooding, the water quality within the flooded pits will be managed, monitored, and treated (if necessary) until the water is of acceptable quality (i.e., based on risk-based assessment, as indicated in the *Aquatic Effects Management Program*) to be allowed to freely mix with the water in Third Portage or Wally lakes.

Fine silts and clays will provide habitat for early benthic colonizers (e.g., insect larvae). Removing (or somehow isolating, e.g., covering with rock) this key habitat could have implications for the rate of recovery in this zone. Several metals (arsenic, chromium, copper, lead, zinc) in sediments currently exceed CCME guidelines for the protection of aquatic life in the project lakes and are a reflection of local mineralogy. While these metals may exceed the guidelines, this does not necessarily mean that adverse effects are to be expected.

The *Aquatic Effects Management Program* for the project describes the approach to be followed to ensure that water quality in re-flooded areas are acceptable prior to dike breaching. At the time of breaching, the water quality and aqueous environment will have been documented and its adequacy will have been determined prior to mixing of pit lake waters with area lakes and re-introduction of aquatic biota. Monitoring of habitat compensation features within these zones after re-flooding is described in the Habitat Compensation Monitoring Plan.

*Comment DFO-4:*

*It is suggested that Phaser Lake could be used as an attenuation pond for pit water and rock storage run-off. DFO has expressed concerns that the diversion of non-contact water should not impact water levels in Phaser Lake so that overwintering habitat for fish is not impacted by the project. Lake levels will therefore have to be monitored. Additionally, the use of Phaser Lake as an attenuation pond and the resulting impact on fish and fish habitat has not been assessed.*

Response DFO-4:

As detailed in the Mine Water Management Plan and during the Type-A Water License hearing process, the proposed water management plan for the Vault mining area involves the diversion of approximately 152 ha of the Vault Lake tributary area to Turn Lake. This diversion necessitates the construction, during initial site development, of an interceptor ditch to divert non-contact water from the small unnamed lake to the south of Vault Lake toward Phaser Lake. Interceptor ditches and a sump will be required along the southeast edge of the Vault RSF to direct any contact water away from Phaser Lake and toward Vault Lake. Water collected in the Phaser Lake basin during the spring melt will be drawn down to a maximum elevation of 140 masl over the summer

period to minimize impacts to overwintering fish habitat and provide sufficient storage for the following spring freshet and/or extreme runoff events.

The use of Phaser Lake as an attenuation storage pond is presented as one alternative should consideration be given to expanding the Vault Pit footprint to sufficient degree that Vault Lake could no longer be used as an attenuation storage facility. It is understood that the permitting and regulatory implications of all alternatives would need to be evaluated before any decision can be made on a potential pit expansion.

*Comment DFO-5:*

*An Adaptive Management Plan is mentioned in the Executive Summary (4th paragraph), pg1-2 and Section 7.3.1 pg.7-3, however, it is difficult to determine whether this is in reference to a general strategy of Plan. All Plans should be reference appropriately or developed for Board approval.*

Response DFO-5:

The term "Adaptive Management Plan" refers to the general strategy that will be employed to the monitoring of tailings freeze back rather than to a formal plan or document itself. See response to INAC-3 above and GN-2 below for further details on proposed tailings freeze back monitoring.

*Comment DFO-6:*

*A number of control strategies for acid rock drainage are listed in Section 4. This section vaguely describes what strategies will take place at Meadowbank. More detail should be provided especially in regards to monitoring to ensure the strategies are effective.*

Response DFO-6:

See response to INAC-3 above.

*Comment DFO-7:*

*Lake sediments (page 5-1 last paragraph) are proposed to be deposited between the North Portage deposit and the East Dike to potentially be used for reclamation material. What is the fate of these materials should they not be used for reclamation? Their placement near high value fish habitat is a concern.*

Response DFO-7:

Options for the management of remaining stockpiled lakebed sediments will be evaluated in conjunction with fish habitat compensation planning prior to completion of Portage Pit reflooding. Potential options to be considered may include submergence in place and/or co-disposal with tailings in the TSF.

Environment Canada

*Comment EC-1:*

*In the Water Management Plan (WMP), ammonia and nitrate are mentioned in that, "explosive use will need to be carefully dosed to avoid ammonia and nitrate loading to site drainage waters in both Portage and Vault areas." However, other than this mention there is no detailed ammonia management plan included in the water or the waste management plans. EC requests that this be provided, and asks that it include current calculations of the loss rate based on experience to date.*

Response EC-1:

See response to INAC-1 above.

*Comment EC-2:*

*The Plan submitted under Water License 8BC-TEH0809 refers primarily to construction details and pre-site management, so most of it would not need to be integrated into the new plan. However there is a section that refers to road and quarry maintenance, and this has not been addressed by the updated plan. There is a section on haul roads in the MWMP (section 4.5.3 pg 4-8) but there is no discussion on quarry areas.*

Response EC-2:

See response to INAC-2 above.

*Comment EC-3:*

*The plan does not outline a specific field testing program, as required in F.16.c. The plan states that cover trials will be completed during operation to confirm the required cover thickness to physically isolate the tailings and confine the active layer within relatively inert materials; however, there is no mention of how the field testing program will be conducted.*

Response EC-3:

See response to INAC-3 above.

*Comment EC-4:*

*Item F.16.d. is not explicitly addressed, although seepage as a general category is discussed with respect to monitoring and management.*

Response EC-4:

See response to INAC-4 above.

*Comment EC-5:*

*TSS is referenced for the dewatering criteria; turbidity should be noted as this seemed to be the limiting parameter for discharges.*

Response EC-5:

Turbidity dewatering criteria as defined in Part D, Item 16 of the Type-A Water License will be included in addition to TSS dewatering criteria in future versions of the Mine Water Management Plan (page 3-14 of current version).

*Comment EC-6:*

*Table 3.3 notes a final elevation of the tailings of 144.9 m with 30% ice entrapment. At the bottom of the same page (3-26) addition of the lake-bottom sediments is shown as a percentage of the capacity at elevation 148 m. Is the additional 3.1 meters in elevation a "worst-case" estimate for maximum ice and sediments? It is not clear what the elevation of 148 m represents.*

Response EC-6:

The storage volume at elevation 148 m represents the total available storage capacity (or the struck volume) of the TSF accounting for a 2-m freeboard allowance from a dike crest elevation of 150 m. This volume is used for comparative purposes only to qualify the relative magnitude of potential sediment volumes. No relationship between the tailings elevations reported in Table 3.3 and sediment accumulation is intended.

*Comment EC-7:*

*How will seepage in the collection ditches be tracked? Permafrost will be used down-gradient of the water control structures – will embankments be instrumented to monitor that freezing conditions occur?*

Response EC-7:

As detailed in Sections 4.3 and 5.2 of the Mine Water Management Plan, the collection ditches will be constructed in consideration of the permafrost environment and in a manner to limit potential seepages from the channels. Attempts will be made to avoid constructing ditches in ice-rich areas where thaw instability is a concern. If this cannot be achieved, the channels will be located in-ground with shallow excavation into the overburden soil or rock, which may require the excavation and replacement of ice-rich soils with compacted till materials. The channels have been designed as oversized structures, which will allow for the addition of insulated channel lining materials where required to limit degradation of the permafrost.

Thermal monitoring is currently being planned for large water management infrastructure only, including the Stormwater Dike, the TSF perimeter structures including the Central Dike, the East Dike, and the Bay-Goose Dike. Thermal monitoring is also being planned within the TSF and RSF facilities. Further details of the proposed thermal monitoring program for these facilities are provided in the response to GN-2 below.

The *Meadowbank Gold Project Water Quality and Flow Monitoring Plan Version 2*, dated May 2009, provides details on the program to monitor water quality within and downstream of the water management infrastructure, including contact water ditches and sumps. The results of the water quality sampling will be used to confirm that contact water is not reporting directly to the environment from the ditches.

*Comment EC-8:*

*The second sentence of the second-last paragraph is unclear: "The Reclaim Pond will receive little site contact water, and will therefore not have minimal attenuation function."*

Response EC-8:

The sentence should properly read: "The Reclaim Pond will receive little site contact water, and will therefore have minimal attenuation function". The sentence does not add significantly to the intent of the paragraph and will likely be removed from future versions of the document.

*Comment EC-9:*

*The possibility of using Phaser Lake is mentioned as an alternative attenuation storage pond (the paragraph is carried forward from the 2007 version of the plan). It is my understanding that Phaser Lake is fish-bearing, and the use of this lake was not contemplated in the Environmental Assessment, nor in the regulatory processes.*

Response EC-9:

See response to DFO-4 above.

*Comment EC-10:*

*The figures showing the site water balance show decant volumes directed to Third Portage Lake (Figures 6.2 to 6.5) and Wally Lake (Figures 6.9 to 6.11) from mine water and runoff collected in the Tailings Impoundment Area. The first such discharge occurred in 2009, and would continue until pit flooding for the Portage site, and for the first several years of operations at the Vault pit. Recent discussions with the mine staff had indicated that the need to discharge to Third Portage Lake could (would) be deferred for several years at least, and perhaps until pit flooding commenced. Clarification is requested as to whether discharge to the receiving environment is planned or not. The text in Section 6.3 mentions the TSF capacity to store all excess water, but does not specify that this will be the case.*

Response EC-10:

As a point of clarification, Figures 6.2 to 6.5 and 6.9 to 6.11, respectively, show decant water volumes directed to Third Portage Lake and Wally Lake from the Portage and Vault attenuation storage ponds only. Mine contact and runoff water collected in the TSF (Reclaim Pond) is not discharged to the environment.

Actual attenuation pond decant volumes to the environment during mine operations will be dependent on realized contact water inflows to the facilities and, in the case of the Portage Attenuation Pond, construction requirements for the Central Dike. Note that the Portage Attenuation Pond is operational for the first 3 to 4 years of mine life only while tailings are being deposited in the north cell of the TSF. Once tailings deposition begins in the south cell, decant from the Portage Attenuation Pond no longer occurs and the facility is operated as a Reclaim Pond.

The TSF facility is predicted to have sufficient capacity to store all excess water (once reclaim demands are satisfied) reporting to the Reclaim Pond during mine operations. While the treatment and discharge of excess Reclaim Pond water to the mined out Portage Pit (not Third Portage Lake) may occur as early as Year 6 (2015) to facilitate pit reflooding, the Water Management Plan assumes that reclaim water treatment and discharge would not commence until the end of mine operations. The Mine Water Management Plan also assumes that the attenuation ponds would be operated in such a manner to minimize the amount of water stored within the facilities over the winter period.

*Comment EC-11:*

*Updated water quality predictions have been provided, and it should be noted that all predictions are for the dissolved form of metals rather than the total form. The predictions section should specify what concentration of total suspended solids is predicted (worst case would be the water License limits of 15 mg/L) and an estimate of the metals concentrations which could be associated with particulates. The predicted concentrations in the "Probably" scenario are generally below License levels for the attenuation ponds, but mercury would be one example where the contributions of particulate-associated mercury would potentially put concentrations above the License criteria in the Portage Attenuation Pond. This would be more of a concern if the predictions for the "Possible Poor End" scenario are realized.*

Response EC-11:

Sections 7.3 and 7.7 of Mine Water Management Plan indeed state that predicted values are for the dissolved concentrations and that the additional mass load from suspended solids was not considered. Given that the quantity of suspended particles (TSS) in water depends on the complex interaction between the physical characteristics of flow and water conveyance systems, the uncertainty of the results could be considerably higher than the modeled value. Given the inherent uncertainty, TSS is not included in the predictive model. Sediment control measures are instead built into the water management plan to maintain TSS concentrations below the license limit at the point of discharge. The added chemical load from TSS was considered in the evaluation of effluent discharge limits as stated in Section 2 of Doc. 621, *Meadowbank Gold Project Proposed Discharge Water Quality Criteria*, dated March 2008. This document references Doc. 516, *Report on Water Quality Predictions Meadowbank Gold Project Nunavut*, dated August 2007 where the theoretical chemical load from TSS was calculated and where mercury was not anticipated to increase aqueous concentrations to above licensed discharge criteria, given the low total and leachable concentration of mercury in area sediment and rock (*Report on Static Test Results for Overburden, Mine Site Infrastructure Rock, Pit Rock and Tailings, Meadowbank Gold Project, Nunavut*, dated September 2005).

*Comment EC-12:*

*Inclusion of the long term pit lake water quality line for both sites was useful. The document did not specify whether the predicted concentrations for Portage are based on a fully mixed pit, or whether there would be a chemocline separating an upper better-quality layer of water overlying a denser layer with higher concentrations of major ions and metals.*

Response EC-12:

Sections 7.7.2 and 7.7.3 of the Mine Water Management Plan indicate that whole lake water quality predictions for the Portage and Vault pit lakes post-closure consider fully mixed conditions. A chemocline is expected to develop temporarily at the base of both the Portage and Vault pit lakes. The chemocline would separate an upper better-quality layer of water from a thinner, denser water layer at the base of pit lakes which would have slightly higher constituent concentration, as explained in Doc. 516, *Report on Water Quality Predictions Meadowbank Gold Project Nunavut*, dated August 2007. Future versions of the Mine Water Management Plan will re-state the conclusions of the study on pit lake water mixing.

*Comment EC-13:*

*One of the concerns EC raised in the course of the water License hearings was the documentation of effective rock segregation practices; the waste management plan should reference the updated Operational ARD-ML Sampling and Testing Plan (2008) as submitted for License Part I.4.*

Response EC-13:

See response to INAC-5 above.

Government of Nunavut

*Comment GN-1:*

*Part F-Section 16 of the water license states that the Licensee is to include an Ammonia Management Plan as part of the revised Mine Waste and Water Management Plan; however, the current plans do not appear to have this inclusion. The DOE recommends that the Proponent prepare and submit an Ammonia Management Plan as an addendum to the current Mine Waste and Water Management Plan.*

Response GN-1:

See response to INAC-1 above.

*Comment GN-2:*

*Monitoring: DOE recommends that the Proponent include a site map outlining the locations of all monitoring wells and thermistors on site.*

Response GN-2:

Details on existing groundwater monitoring well on site are provided in the Groundwater monitoring plan V2 March 2009. Figure 2.3 *Thermistors and Section Location Plan* will be updated in future versions of the Mine Waste Management Plan to include the new thermistor installations.