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MEADOWBANK GOLD PROJECT

2010 Annual Report

Prepared for:
Nunavut Water Board
Fisheries and Oceans Canada
Indian and Northern Affairs Canada
Kivalliq Inuit Association

Prepared by:
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SECTION 1 • INTRODUCTION

The Meadowbank Gold Project operated by Agnico-Eagle Mines Limited - Meadowbank Division (AEM) is located approximately 70 km north of the Hamlet of Baker Lake, Nunavut. The project components include marshalling facilities in Baker Lake, the 110 km All Weather Private Access Road (AWPAR) between Baker Lake and Meadowbank and the Meadowbank mine site.

The Meadowbank mine officially began the operations phase of the project on February 19, 2010. Mining took place from both the North and South Portage Pits. Throughout the year construction of a number of dewatering dikes and roads was undertaken: Stormwater Dike (phase 2), Saddle Dam #1 (phase 2), Saddle Dam #2, Bay-Goose Dike (phase 1, foundation grouting), Bay-Goose Causeway, Bay-Goose Dike (phase 2), and Rockfill Road #1. In addition, construction and commissioning of the following facilities was completed: the process plant, power plant, emulsion plant, primary and secondary crushers, reclaim tunnel, tailings pipeline and reclaim water system, the truck shop/service complex, and 2 additional 10ML fuel tanks at our Baker Lake facilities.

These various components and activities associated with the project require a number of different authorizations from regulatory agencies including the Nunavut Water Board (NWB), the Environment Canada (EC) Metal Mining Effluent Regulations (MMER); the Department of Fisheries and Oceans Canada (DFO), Indian and Northern Affairs Canada (INAC); the Kivalliq Inuit Association (KIA) and the Nunavut Impact Review Board (NIRB).

This report is written to address all of the 2010 annual reporting requirements of the project under these authorizations:

- NWB Type A Water License 2AM-MEA0815;
- DFO HADD Authorization NU-08-0013 Western Channel Temporary Crossing;
- DFO HADD Authorization NU-03-190 AWPAR;
- DFO HADD Authorization NU-03-191 Mine Site;
- INAC Land Leases 66A/8-71-2 (AWPAR) and 66A/8-72-2 (AWPAR Quarries); and
- KIA Right of Way KVRW06F04.

Annual reporting requirements for the NIRB Project Certificate No. 004 are presented in the “2010 Annual Report - NIRB”, to be submitted at a later date. Reporting requirements for the MMER have been submitted directly to Environment Canada; results are presented herein to comply with the NWB Type A water license.

Table 1.1 outlines each requirement by authorization and report section. Table 1.2 presents the status of each of the sampling stations stipulated in Part I, Schedule 1 of Water License 2AM-MEA0815.

SECTION 2 • CONSTRUCTION / EARTHWORKS

The following section discusses reporting requirements related to site construction and earthworks activities associated with dikes, dams and quarries.

2.1 DIKES AND DAMS

2.1.1 Performance Evaluation

As required by water license 2AM-MEA0815, Schedule B, Item 1:

a. An overview of methods and frequency used to monitor deformations, seepage and geothermal responses;

The surveillance program consists of several types of inspection:

- Routine Inspection – carried out daily by designated qualified engineer;
- Engineering Inspection – carried out annually by a qualified engineer (consultant), during open water if possible, to verify that the facilities are functioning as intended.

Table 2.1 describes the routine geotechnical monitoring program.

b. A comparison of measured versus predicted performance;

The comparison has not been made due to the lack of data available so far.

c. A discussion of any unanticipated observations including changes in risk and mitigation measures implemented to reduce risk;

On July 2009, a sinkhole was observed in the upstream of the East dike cutoff wall. The sinkhole has been inspected by AEM, Golder and the Meadowbank Review Board (2009-AEM-Annual Report). The weir installed in 2009 to monitor the seepage rate was leveled and improved. Another weir was installed in mid-August for the second seepage zone in the south portion of East Dike (station ±60+225). The rate of seepage for the two weirs appeared stable at about 9 L/s & 4 L/s for the north and south weir respectively. The rate of the north seepage was about the same than the rate of 2009. A permanent seepage collection system should be installed during 2011 season.

During the summer season, investigation in the sink hole was undertaken to define the thermal profile where hot water could cross the slurry wall. A few thermistor strings were installed along the axis in the sinkhole area. Monitoring will be continuing in 2011 and information will be useful if mitigative work is necessary.

d. As-built drawings of all mitigative works undertaken;

No mitigative works was undertaken in 2010 for dewatering dikes or for those of the Tailings Storage Facilities (TSF).

e. Any changes in the design and/or as-built condition and respective consequences of any changes to safety, water balance and water quality;

The only major change in design during the dike construction was to seal the dike with a partial cutoff followed by a jet grouting program at Bay Goose Dike South. That decision has been taken with the collaboration of the MDRB to have a better control on the existing conditions in the deep sections without exceeding the limit of the equipment available. A long boom has been constructed especially for that project. Minor changes are listed below:

Stormwater Dike (SWD)

- Construction of the dike to the elevation 148.0 m (compared to 150.0 m in the design). Accordingly with the storage capacities, the dike could be raise to the final elevation;
- Slight re-alignment of the centerline in the south portion to field fit with the construction of the Saddle Dam 2 (SD2);
- Adapt the East abutment (connected with RF1) and the south abutment (junction of the SWD/SD2) with the field condition; and
- The liner installation of the south abutment has been reported to next year due to freezing conditions. A coffer dam in the upstream side has been constructed to the elevation 142.0 m to have enough freeboard during the deposition of tailings during winter.

Saddle Dam 1 (SD1)

- Construction of a temporary dam at the upstream toe to retain tailings. The addition of tailings helps to protect the dike from seepages.

Saddle Dam 2 (SD2)

- Installation of the LLDPE liner limited to 146.0 m due to freezing conditions; and
- Centerline of the south portion has been slightly rotated to fit with the construction of the Saddle Dam 3 (2011 dike season).

Bay Goose Dike South

- Construction of a causeway during the ice coverage period to protect fish habitats. The causeway helps by reducing the turbidity during the construction;
- Installation of pumping stations in the primary trench to reduce quantities of TSS reaching the lake side. All this water has been rerouted and treated before being sent to the environment; and

- Slight displacement of the alignment in Channel 3 to adjust the trench with the excavated surface.

f. Data collected from instrumentation used to monitor earthworks and an interpretation of that data;

Section 4.0 of the '*2010 Annual Geotechnical Inspection Report'*, provided in Appendix A1, presents the instrumentation data collected in 2010. AEM's implementation plan in response to the geotechnical inspection is provided in Appendix A1, for informational purposes.

g. A summary of maintenance work undertaken as a result of settlement or deformation of dikes and dams; and

No maintenance work has been undertaken in 2010.

h. The monthly and annual quantities of seepage from dikes and dams in cubic metres.

See Section 7.8 below for a discussion of seepage from the East dike.

2.1.2 Independent Geotechnical Expert Review Panel Reporting

As required by water license 2AM-MEA0815 Part I, Item 14: ***The Licensee shall submit to the Board as part of the Annual Report required under Part B Item 5, all reports and performance evaluations prepared by the Independent Geotechnical Expert Review Panel.***

Three reports (Reports 5, 6 and 7) were prepared by the Independent Geotechnical Review Board in 2010. These reports, and AEM's response, are included in Appendix A2.

2.1.3 East Dike and Bay-Goose Dike Phase 1 Construction Evaluation

AEM commissioned studies in each of the last three years (2008 - 2010) to address concerns regarding the potential impacts of elevated TSS concentrations on the local receiving environment from dike construction. Based on the literature, elevated TSS concentrations can directly or indirectly affect the entire range of organisms in the aquatic environment, so these studies have addressed a broad array of ecosystem elements. The "*Aquatic Effects Monitoring Program – Targeted Study: Dike Construction TSS Effects Assessment Study 2010*" is attached as Appendix A3.

The East Dike TSS EAS was initiated in 2008 and targets the effects of TSS from East Dike construction, primarily on Second Portage Lake, but also extending into Tehek Lake. As planned, this study continued in 2009 and 2010, focusing more on characterizing potential deposition-related impacts, largely to periphyton and benthic invertebrate communities.

The Bay-Goose TSS EAS was initiated in 2009 and targets the effects of TSS from Bay-Goose construction, primarily on the east basin of Third Portage Lake, but also downstream into Second Portage Lake and Tehek Lake. Due to the phased nature of construction of the Bay-Goose Dike (i.e., Phase 1 in 2009; Phase 2 in 2010), the timing of study components is variable, with some conducted in 2009 and others slated for either 2010 or possibly later. Collectively, the results of these studies have improved our understanding of the potential short-term (i.e., on the order of a year) and long-term (i.e., multiple years) effects of elevated TSS on a broad range of ecosystem elements in local receiving environments.

TSS EAS studies have targeted both the pelagic zone (i.e., water column) and benthic zone (i.e., lake bottom) of receiving environments. Elevated TSS concentrations over basin-wide spatial scales were well documented for both studies, lasting on the scale of weeks-to months. While the TSS had obvious consequences for water clarity (and thus light penetration), no other substantial changes to local limnology were identified. From a water chemistry perspective, elevated metals and nutrients were largely associated with particulates rather than found in the dissolved phase (and more bioavailable). From a water column (pelagic zone) perspective, both TSS EAS studies identified some short term effects to primary productivity (e.g., phytoplankton biomass). However, these did not appear to cascade up the food chain to zooplankton. Consequently, based on available data, indirect effects to higher-level organisms through reduced prey biomass are considered unlikely. This was also corroborated in the laboratory with a larval trout test using live zooplankton as a food resource. With respect to potential direct effects in the water column, no adverse effects to zooplankton or fish were seen in toxicity tests. Thus, the body of evidence collected to date suggests that while some effects have been seen in the water column, they are likely limited in time and have not been shown to propagate up the food chain.

In contrast to the pelagic zone, where potential effects would be linked to suspended sediments in the water column and thus less likely to have prolonged consequences, the benthic zone is susceptible to the potential effects of sedimentation. Sediment traps have been used to document sedimentation rates, deposition thickness and chemistry of settled matter over the last three years, both during the open water season and under ice cover. The 2008 results suggested that between 1 to 2 mm of construction-related deposition occurred in Second Portage Lake and identified possible changes to surface sediment chemistry (i.e., settled material in the traps contained elevated concentrations of several metals). Surface sediment chemistry results for 2009 did confirm that certain metals had increased in concentration in Second Portage Lake and in Tehek Lake relative to baseline. Thus, concerns in this zone relate primarily to physical smothering and to metals toxicity.

The concerns regarding metals toxicity were directly tested in 2010 using sediment toxicity tests and sequential extraction analysis. Results of amphipod (*Hyalella azteca*) and midge (*Chironomus tentans*) survival and growth endpoints in bioassays showed that surface sediments collected from within or adjacent to the East Dike construction zone (i.e., the zone delineated by the turbidity barriers) were not toxic relative to local reference sediment.

The sequential extraction results showed that most of the metals in the sediment are associated with the residual matrix fraction, which is not considered bioavailable. Consequently, metals toxicity is not likely an issue in Second Portage Lake. From an physical effects perspective, initial studies on periphyton biomass and community structure in Second Portage Lake conducted in 2009 identified reduced biomass and altered community composition in close proximity to the East Dike (i.e., in an area that would have been exposed to high TSS concentrations in 2008); these differences were not observed in an area exposed to lower TSS concentrations in 2008. Follow-up studies conducted in 2010 provided greater spatial resolution, confirming that effects were limited to the area closest to the East Dike. For benthic invertebrates, the 2008 CREMP data indicated reduced benthic invertebrate abundances (a marginal trend) in Second Portage Lake (that did not extend to Tehek Lake); this was no longer observed in 2009 (i.e., abundance was similar to baseline), suggesting a short-term physical effect and subsequent recovery. The higher resolution EAS results in 2009 highlighted natural differences between Second Portage Lake (and Tehek) and the control areas (i.e., inherent inter-lake differences). Unfortunately, the 2010 results were contradictory, with the CREMP showing an even bigger drop in 2010 than that observed in 2008 (despite very low TSS exposure in 2010) and the EAS data suggesting further recovery relative to control areas. When considered together, the 2010 CREMP results are likely highly localized and unrelated to TSS. Available data for potential effects to benthic invertebrate communities in the east basin of Third Portage Lake are also inconclusive. While most results point to the lack of any TSS-related impacts to the community, there have been two successive drops in abundance that coincide with dike construction. However, these “drops” were likely due to natural variability (2009) or a regional trend of decreased abundance and richness (2010).

As for fish and fish habitat, the 2008 results raised concerns regarding physical effects due to sedimentation on high-value habitats. These concerns were raised based on the sediment trap results (discussed above) and on the trout embryo development toxicity (no renewal) test, which suggested that physical settling of particles onto embryos could impair development. Underwater video was used in 2009 to examine high-value fish habitat for evidence of increased sediment deposition; areas close to the East Dike were found to contain more obvious signs of sediment accumulation than areas further away.

TSS EAS studies are scheduled to continue in 2011 with a focus on evaluating the potential effects on periphyton and fish habitat related to the Bay-Goose Dike EAS; the evaluation of benthic invertebrate community will continue at the TPE CREMP station.

2.1.4 Bay-Goose Dike Phase 2 Construction Evaluation

The environment department of AEM conducted causeway and in-water dike construction monitoring for the Bay-Goose phase II dike construction in accordance with the approved Water Quality Monitoring and Management Plan for Dike Construction and Dewatering. The in-water dike construction Total Suspended Solids (TSS) management included the

construction of the causeway during the ice-cover period and the installation of 2 layers of turbidity curtains and a water pumping system to prevent TSS from entering the receiving environment for the completion of the dike during the open water period. Details of the monitoring results are presented in the "*2010 Causeway and Dike Construction Monitoring Report*", attached in Appendix A4.

During winter construction of the causeway and dike construction during the open-water season turbidity was used as a surrogate for TSS (using a TSS/turbidity correlation) which provided AEM with the ability to forecast TSS levels and manage construction activity to avoid licence limit exceedences. Routine monitoring was completed during the causeway construction at 3 stations that moved with the advancement of the causeway construction front. During open water dike construction, routine monitoring was completed at seven (7) fixed stations daily and weekly at broad stations. Water chemistry samples were collected on a weekly basis and submitted to a CALA certified laboratory to verify TSS, general parameters such as pH, conductivity, and hardness, nutrients, anions, total metals and dissolved metals concentrations. Throughout the construction of the Bay-Goose dike phase II (from February 18th until October 1st, 2010), the maximum monthly mean (MMM) of 15 mg/L and short term maximum (STM) TSS concentrations of 50 mg/L were not exceeded during the open water season. During causeway construction from February 18th to mid-June an STM of 25 mg/L was adopted to protect fish habitat during sensitive life stages. This limit was exceeded only once on May 23rd. No weekly laboratory TSS levels exceeded the license limits throughout causeway and open water dike construction. As a result, no mitigative action was deemed necessary. Collectively, the construction of the causeway which was to provide wind and water current protection; the installation of two layers of turbidity curtains, one layer that was anchored by the causeway and another outside of the first layer, in shallow areas; as well, strategically placed pumps that provided a net influx of clean water within the construction zone were very effective in controlling the amount of TSS escaping into the receiving environment. The planning, management and monitoring approach used in 2010 allowed timely completion of the Bay-Goose Dike phase II generally within the NWB licensed TSS limits.

2.2 QUARRIES

The annual reporting requirements listed in the following sections apply only to quarries located along the All Weather Private Access Road (AWPAR).

As required by INAC Land Lease 66A/8 72-2, Condition 8: ***The lessee shall file a report, annually, with the Minister in the manner and format stipulated by the Minister. The report shall include:***

i. Quantity of material removed and location of removal, for the immediately preceding calendar year; and

ii. Such other data as are reasonably required by the Minister from time to time.

And

As required by INAC Land Lease 66A/8 72-2, Condition 25: ***The lessee shall file, annually, a report for the preceding year, outlining the ongoing borrow area operations completed in conformity with the approved Borrow Management Plan, as well as any variations from the Plan.***

And

As required by KIA Right of Way Authorization KVRW06F04, Schedule E, Condition 8: ***The lessee shall file annually a report for the preceding year, outlining the ongoing borrow area operations completed in conformity with the approved Borrow Management Plan, as well as any variations from the Plan.***

No material was blasted from the quarries on INAC leased lands in 2010.

AEM blasted 51,000 m^3 of rock from Quarry 3, located on KIA leased land, during 2010. During the summer, 21,000 m^3 was used for the maintenance of the AWPAR. The remaining 30,000 m^3 will be used next winter and summer for similar purposes.

SECTION 3 • WATER MANAGEMENT ACTIVITIES

The following section addresses reporting requirements related to water management activities.

3.1 LAKE LEVEL MONITORING

As required by Water License 2AM-MEA0815 Schedule B, Item 2: ***Results of lake level monitoring conducted under the protocol developed as per Part D Item 11 (Water Quality Monitoring and Management Plan for Dike Construction and Dewatering).***

The dewatering of the northwest arm of Second Portage Lake (the impoundment area) began on March 17, 2009 and continued throughout 2010. The impoundment water was discharged into Third Portage Lake; no impoundment water was discharged into Second Portage Lake in 2010. A description of the dewatering monitoring program is provided in Section 7.2.

The elevation, in metres above sea level (masl), of Third Portage Lake (TPL) was monitored on a weekly basis, weather and ice conditions permitting, throughout the year. The elevation in Second Portage Lake (SPL) was monitored occasionally for informational purposes. The location of the lake level survey monitoring is identified as TPL and SPL on Figure 1.

The lake levels of Third Portage Lake and Second Portage Lake are presented in Table 3.1. Lake levels remained within the range of naturally occurring levels.

Lake levels of the northwest arm of Second Portage Lake were also monitored. Table 3.1 presents the daily elevation monitoring results of the impoundment area (identified as 'Intake' on Table 3.1 and 'IN' on Figure 1). Throughout the year, as dewatering proceeded, lake levels in the impoundment area dropped from 124.4 to 109.8 masl. This information is provided for informational purposes only.

3.2 WATER BALANCE WATER QUALITY MODEL REPORTING SUMMARY

As required by Water License 2AM-MEA0815 Schedule B, Item 3: ***Summary of reporting results for the Water Balance Water Quality model and any calibrations as required in Part E Items 6 and 7.***

The first update of the water balance model for the Meadowbank Gold Project was completed September 2, 2010. This report is included in Appendix B1.

3.3 BATHYMETRIC SURVEYS

As required by Water License 2AM-MEA0815 Schedule B, Item 4: ***The bathymetric survey(s) conducted prior to each year of shipping at the Baker Lake Marshalling Facility.***

The bathymetric survey in Baker Lake was completed on August 20, 2010 and is included in Appendix B2.

3.4 PREDICTED VS. MEASURED WATER QUALITY

As required by Water License 2AM-MEA0815 Part E, Item 8: ***The Licensee shall, on an annual basis during Operations, compare the predicted water quantity and quality within the pits, to the measured water quantity and quality. Should the difference between the predicted and measured values be 20% or greater, then the cause(s) of the difference(s) shall be identified and the implications of the difference shall be assessed and reported to the Board.***

Insufficient data from the North Portage Pit sump was collected in 2010 to complete such a comparison. See Section 7.3 for an explanation of the data collected.

3.5 ADDITIONAL INFORMATION

As required by Water License 2AM-MEA0815 Schedule B, Item 24: ***Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported.***

The Board did not request any additional details on water use in 2010.

SECTION 4 • WASTE ROCK MANAGEMENT ACTIVITIES

4.1 GEOCHEMICAL MONITORING

In accordance with Water License 2AM-MEA0815 Schedule B, Item B-5:

Geochemical monitoring results including:

a. Operational acid/base accounting and paste pH test work used for waste rock designation (PAG and NPAG rock);

In 2010, AEM sampled every blast hole and analysed the percentages of sulphur and carbon. The results from these analyses are used to differentiate Non-Potentially Acid Generating (NPAG) from Potentially Acid Generating (PAG) materials. The Total Sulphur (S) analysis is converted into a Maximum Potential Acidity (MPA) value by multiplying the Total S wt% by 31.25 which yields an MPA value in Kg CaCO3 equivalent. The Total Inorganic Carbon analysis is similarly converted into a Carbonate Neutralization Potential (NP) by multiplying the Total wt% Inorganic Carbon (reported as %CO2) by 22.7 which yields an NP value in Kg CaCO3 equivalent. The Net Potential Ratio (NPR) for the blast hole drill cutting sample is then calculated as follows: NPR = NP/MPA.

The mine geology staff uses the derived NPR to characterize the rock in the blast pattern. The mine surveyor uses this information to delineate the dig limits within the blasted rock to guide the shovel and loader operators in directing where the rock is to be taken. All the NPAG rock was used for construction of the Bay-Goose Dike, Saddle Dam 1, South Camp Dike, roads and pads. The PAG rock was used in the footprint of the Tailings Impoundment Area; Stormwater Dike and Rockfill Road (RF2). The remainder of the PAG rock was sent to the Portage Waste Rock Facility (5,345,886 tonnes).

In 2010, a total of 52,752 production samples were assayed to determine NPAG and PAG rock. The results and the resultant NPAG-PAG classification confirmation are logged in the Meadowbank GEMCOM database. Due to the large volume of data, the results are not included in this annual report. These results can be provided on demand.

To validate the method used by AEM, 150 samples (including ultramafic volcanic, intermediate volcanic and iron volcanic rock types) from production drill holes were sent to an accredited commercial lab (external lab) for acid base accounting (ABA) analysis using the Modified Sobek Method for determination of NP/AP and metal leaching using the Shake Flask Method.

A revision of the August 2008 Operational ARD/ML Sampling and Testing is ongoing and will be completed in the second quarter of 2011. This plan is being revised to reflect AEM's

current waste rock characterization practices. AEM will continue to analyze samples for ABA and metal leaching using in 2011; approximately 200 samples will be sent to an accredited lab for ABA and metal leaching tests.

b. As-built volumes of waste rock used in construction and sent to the Waste Rock Storage Facilities with estimated balance of acid generation to acid neutralization capacity in a given sample as well as metal toxicity;

Refer to the discussion in Sections 4.1a and 4.2.

c. All monitoring data with respect to geochemical analyses on site and related to roads, quarries, and the All Weather Access Road;

Routine water quality sampling results along the AWPAR are presented in the document '*All Weather Private Access Road 2010 Water Quality Management Report'* included in Appendix C1.

d. Leaching observations and tests on pit slope and dike exposure;

No leaching was observed on the pit slope or dike faces.

e. Any geochemical outcomes or observations that could imply or lead to environmental impact;

In 2010 there were no geochemical outcomes or observations that could imply or lead to environmental impact.

f. Geochemical data associated with tailings solids, tailings supernatant, cyanide leach residue, and bleed from the cyanide destruction process including an interpretation of the data;

The mill commenced operations in February 2010; all data associated with the tailings and cyanide destruction process is kept at the mill. Due to the large volume of data, the results are not included in this annual report. These results can be provided on demand.

g. Results related to the road quarries and the All Weather Private Access Road.

Results are included in the '*All Weather Private Access Road 2010 Water Quality Management Report'* included in Appendix C1.

4.2 WASTE ROCK VOLUME

In accordance with Water License 2AM-MEA0815 Schedule B, Item B-6: ***Volumes of waste rock used in construction and placed in the Rock Storage Facilities.***

The total volume of waste rock from the Portage Pits in 2010 is 13,285,739 tonnes. The use and location of all of the rock, by volume, is presented in Table 4.1 and identified by the following categories:

- Dikes - used for dike construction;
- Roads – used for road construction;
- Crushers – taken to the mobile crusher and used for construction or maintenance purposes;
- Waste Dump – taken to the waste rock storage facilities;
- Landfill – used to cover the landfill;
- Stockpiles; and
- Other – miscellaneous uses.

4.3 TAILINGS STORAGE FACILITY

4.3.1 Tailings Storage Facility Capacity

As required by Water License 2AM-MEA0815 Schedule B-7: ***An update on the remaining capacity of the Tailings Storage Facility.***

A total of 1,602,008 m^3 of tailings was placed in the tailings storage facility in 2010. A monthly summary of the tailings volume is provided in Table 4.2.

A revision of the tailings deposition plan is ongoing and will be completed by the end of the second quarter of 2011. This revision will give AEM an update of the remaining capacity in the tailings storage facility.

4.3.2 Fault Testing and Monitoring

As required by Water License 2AM-MEA0815 Schedule B, Item 15: ***Results of monitoring pursuant to the Fault Testing and Monitoring Plan (August 2007).***

The '*Fault Testing and Monitoring Plan'* outlines the testing and monitoring procedures that will be conducted to determine the permeability of faults that extend through the Central Dike. There are no results to report in 2010; the investigation of the Central Dike will begin in 2011.

4.3.3 Capping Thickness

As required by Water License 2AM-MEA0815 Schedule B, Item 17: ***A summary of on-going field trials to determine effective capping thickness for the Tailings Storage Facility and Waste Rock Storage Facilities for the purpose of long term environmental protection.***

Field trials have not yet commenced.

SECTION 5 • WASTE MANAGEMENT ACTIVITIES

5.1 LANDFILL MONITORING

As required by Water license 2AM-MEA0815 Schedule B, Item 8: ***Summary of quantities and analysis of seepage and runoff monitoring from the landfills.***

Seepage and runoff monitoring of the Landfill is discussed below in Section 7.5.

5.2 SOLID WASTE DISPOSAL ACTIVITY

As required by Water License 2AM-MEA0815 Schedule B, Item 9: ***A summary report of solid waste disposal activities including monthly and annual quantities in cubic metres of waste generated and location of disposal.***

And

NIRB Project Certificate No.004 Condition 74: ***Provide annual report of the quantity and type of waste generated at the mine site distinguishing landfilled, recycled and incinerated streams.***

A monthly summary of the amount of waste transferred to the landfill and sent to the incinerator in 2010 is included as Table 5.1.

For 2010, it is estimated that 391,150 L of waste oil was generated on site, with 178,750 L of this burned in the incinerator.

A total of 39 seacans filled with hazardous waste materials were shipped south in 2010 for disposal at a registered waste management facility in Quebec. The hazardous waste materials included, but are not limited to, the following items:

- Batteries;
- Hydrocarbon contaminated soil;
- Contaminated hydraulic hoses;
- Waste paint;
- Waste aerosol and flammable containers;
- Waste residue that last contained activated carbon, copper sulphate bags, quick lime bags, sodium cyanide, sodium hydroxide bags and sodium meta-bisulphite bags;
- Waste antifreeze;
- Waste fuel, oil and gasoline;
- Waste propane cylinders;
- Waste grease; and
- Waste oil filters and rags.

Another 11 seacans of used tires were also shipped south for proper disposal.

The following documentation is provided in Appendix D1:

- Hazardous materials inventory by seacan;
- Hazardous materials waste manifest;
- IMO dangerous goods declaration;
- Hazardous materials disposal certificate;
- Used tires manifest; and
- Used tires disposal certificate.

5.3 INCINERATOR

As per Water License 2AM-MEA0815 Schedule B, Item 10: ***Report of Incinerator test results including the materials burned and the efficiency of the Incinerator as they relate to water and the deposit of waste into water.***

And

NIRB Project Certificate No.004 Condition 72: ***On-site incinerators shall comply with Canadian Council of Ministers of Environment and Canada-Wide Standards for dioxins and furan emissions, and Canada-wide Standards for mercury emissions, and AEM shall conduct annual stack testing to demonstrate that the on-site incinerators are operating in compliance with these standards. The results of stack testing shall be contained in an annual monitoring report submitted to GN, EC and NIRB's Monitoring Officer.***

The incinerator was in operation throughout 2010. The incinerator daily report logbook is included in Appendix D2. Of the materials incinerated, approximately 36% of the material was food waste; the other 64% was dry waste comprised of: food containers, cardboard boxes, paper and absorbent rags. The location of the incinerator is highlighted on Figure 1.

The annual incinerator stack testing was completed by Exova Consultants from July 30 to August 1, 2010. Three tests were performed for each containment area. All of the results are below the applicable standards for mercury and dioxins and furans. A copy of the report is provided in Appendix D3.

The annual ash sample was collected on October 5, 2010, in accordance with AEM's '*Incinerator Waste Management Plan'* (AEM, May 2009, v2). The purpose of sampling ash is to determine its acceptability for disposal in the landfill, pursuant to the Government of Nunavut (GN) Environmental Guidelines for Industrial Discharge (2002). In February 2011, it was determined that an error had been made with the laboratory analytical methodology for the October 5th sample, rendering the data invalid. A new ash sample was collected on February 23, 2011. This sample met all of the GN environmental guidelines for industrial discharge. Since ash samples collected in 2009 and February 2011 are acceptable, and no

major changes have been made to the materials placed in the incinerator, AEM is confident that the ash samples throughout 2010 met the GN regulations and were acceptable for disposal in the landfill.

In addition to the above testing, waste oil destined for burning in the incinerator or any waste oil furnace was randomly sampled on a monthly basis and compared to the NWT Used Oil and Waste Fuel Management Regulations (NWT, 2003). This data is presented in Table 5.2. All metals and PCB parameters met the NWT guidelines; flash point for two samples was below the criteria, and chlorine for one sample was elevated above the maximum allowable concentration. Certificates of analysis for the samples are included in Appendix F1.

5.4 ADDITIONAL INFORMATION

As required by Water License 2AM-MEA0815 Schedule B, Item 24: ***Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported.***

The Board did not request any additional details on waste disposal in 2010.

SECTION 6 • SPILL MANAGEMENT

As per Water License 2AM-MEA0815 Schedule B, Item 11 ***A list and description of all unauthorized discharges including volumes, spill report line identification number and summaries of follow-up action taken.***

And

As required by NIRB Project Certificate No.004 Condition 82: ***Monitor the ingress/egress of ship cargo at Baker Lake and report any accidents or spills immediately to the regulatory agencies as required by law and to NIRB's Monitoring Officer annually.***

A summary of unauthorized discharges that occurred in 2010 is presented in Table 6.1. This data was also included in monthly monitoring reports submitted to the NWB. GN Spill Report Forms for the 12 reported spills are included in Appendix E1, as well as follow-up reports for the two fuel tanker incidents. AEM has never received the spill report line identification number.

Spill prevention training was emphasised in 2010 for employees to prevent and to report spills, as follows:

- All employees and contractors must participate in a four hour induction session upon arrival at the mine site, which includes a training section on spill management (prevention, reporting and cleaning); and
- Every employee and contractor who operates a vehicle on the site must participate in training on vehicle operation. Spill management is a component of this training session.

There were no spill reports from Northern Transportation NTCL with respect to transit of the barges en-route to Baker Lake.

SECTION 7 • AQUATIC MONITORING

This section includes the aquatic monitoring requirements from all aspects of the Meadowbank Project.

As required by Water License 2AM-MEA0815 Schedule B-13: ***The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I.***

And

As required by Water License 2AM-MEA0815 Schedule B, Item 14: ***The results of monitoring under the Aquatics Effect Management Plan (AEMP).***

And

As required by DFO HADD Authorizations NU-03-0191 Condition 6.1 (Mine); NU-03-0190 Condition 6 (AWPAR); NU-03-0190 Condition 6 (Western Channel Temporary Crossing): ***Submit written report summarizing 2008 monitoring results and photographic record of works and undertakings.***

A list of the sampling location GPS coordinates for aquatic monitoring programs conducted by AEM is provided in Table 7.1. Figures 1, 2 and 3 illustrate the location of sampling stations at the Meadowbank mine site, EEM receiving environment monitoring program, and Baker Lake marshalling facilities, respectively. Certificates of Analysis are included in Appendix F1.

7.1 CONSTRUCTION ACTIVITIES

Construction monitoring for the project includes all of the water quality monitoring for the dewatering dikes, and all surface runoff during the construction of any facility where water may flow directly or indirectly into a waterbody.

In 2010, water quality monitoring was conducted during the construction of the causeway and Bay-Goose Dike (phase 2). The results of the 2010 dike construction monitoring program are available in the report entitled '*2010 Causeway and Dike Construction Monitoring Report*', attached as Appendix A4. A summary of the TSS effects assessment studies for the Bay-Goose Dike construction was previously presented in Section 2.1.4.

All contact water around the mine site was diverted to stormwater management pond #1 in 2010. Consequently, there were no incidences where runoff water from any facility under construction may flow directly or indirectly into a waterbody.

7.2 DEWATERING ACTIVITIES

Dewatering of the northwest arm of Second Portage Lake (the impoundment area) continued throughout 2010. Two TSS actiflo water treatment plants were used for the dewatering process, although for a large portion of the year only one of the two plants was in operation at any one time. Turbidity and total suspended solids (TSS) are monitored daily at each operating water treatment plant and once per week in Third Portage Lake near the receiving outlet. In addition, pH and total aluminum are measured weekly from each of the water treatment plants and receiving outlet. All of this data was previously reported to the NWB in the monthly monitoring reports. The sampling locations, named DD-WTP from the water treatment plant and DD-TPL from the receiving outlet, are highlighted on Figure 1.

Samples of the discharge water are collected from a valve in the water treatment plant; during periods of bad weather (white out conditions) the road is closed and technicians are not able to access the plant. Sampling at the receiving outlet in Third Portage Lake is conducted during periods of discharge, weather and ice conditions permitting. A turbidity depth profile is performed; samples are collected from the depth with the highest turbidity value.

The results of the 2010 turbidity and TSS monitoring are presented in Table 7.2. Turbidity values were measured in the field by representatives of AEM, as of August 8, 2010, using an Analite NEP 160 turbidity meter (prior to this date turbidity was being measured at the analytical laboratory); quality control calibration for the Analite equipment is discussed in Section 7.13.

The license criteria for turbidity are 30 NTU for the 24 hour maximum, and 15 NTU for the 30 day mean maximum. For TSS, the 24 hour maximum criterion is 22.5 mg/L and 15 mg/L for the 30 day mean maximum. Exceedences of the license criteria are discussed below:

- On June 18 the 24-hour mean TSS concentration (32 mg/L) exceeded the license criteria.
- The 30-day mean TSS concentrations marginally exceeded the regulatory limit on June 27, 28 and 30 (15.3 mg/L to 15.5 mg/L). On July 2 and 3 the 30-day mean TSS concentrations (15.1 mg/L) continued to marginally exceed the license limit.
- On July 20 the 24-hour mean TSS concentration (36 mg/L) exceeded the license criteria.
- On August 19 the 24-hour mean TSS concentration (65 mg/L) exceeded the license criteria.

For all exceedance events, the TSS water treatment plants were inspected and any necessary corrective actions taken to improve the functioning of the plants.

The results of the 2010 pH and total aluminum monitoring are presented in Table 7.3. The license criteria for pH are between 6.0 and 9.0. For total aluminum, the 24 hour maximum criterion is 3.0 mg/L and 1.5 mg/L for the 30 day mean maximum. There was no

exceedance of the license limits for total aluminum. One pH value at the treatment plant fell below the criteria range (5.93 on July 19, 2010). Two pH values measured at the receiving outlet in Third Portage Lake also fell below 6.0 units (5.83 on May 5 and 5.43 on July 21, 2010). pH measurements analyzed by the analytical laboratory were observed to be consistently lower than field measurements using a Hoskin Scientific 340l pH meter calibrated at each sampling event (see Section 7.13 for a discussion of the calibration results). It was agreed that the field measurements were more accurate. As of August 2, 2010, all reported pH values are field measured data. No further pH values measured below the criterion value of 6.0 units after this date. Consequently, the pH values that fell below 6.0 are believed to be errors due to sampling methodology, and not true exceedences of the license criteria.

In addition to the routine sampling above, two water samples were collected from the dewatering impoundment area on September 14, 2010 and analyzed for total and dissolved metals and various other parameters. This data is presented in Table 7.4 for informational purposes only. The sampling location, called DD-pond, is shown on Figure 1.

7.3 WATER COLLECTION SYSTEM

A water collection system comprised of stormwater management ponds, attenuation ponds, ditches and sumps has been developed to control surface water for the Meadowbank project.

All surface water runoff around the mine site is directed to stormwater management pond #1, often referred to as Tear Drop Lake. In August 2010 the water level in the pond was lowered by 1 m; this represents approximately 60,000 m^3 of water. The water was not released into the environment; the water was pumped from stormwater management pond #1 to the tailings pond. There were no discharges to stormwater management pond #2.

In 2010 Meadowbank did not yet have an attenuation pond, as the northwest arm of Second Portage Lake was still in the dewatering phase. All runoff water intended for the attenuation pond is currently being directed to the tailings pond.

In 2010 a sump was constructed in the North Portage pit in an area of water accumulation. This sump represents sampling station ST-17 in the NWB water license. This sump was located adjacent to a till wall, not near a pit (rock) wall, and collected run off from the till wall. The water in this sump is therefore not representative of pit water, and is not representative of the predicted scenarios in the water balance model. Consequently, no comparisons of pit water to predicted water modelling scenarios could be made. The water in the sump was sampled and analyzed for water quality for informational purposes only; Table 7.5 presents the data. The water that collected in the North Portage pit sump was transferred to the tailings pond.

7.4 TAILINGS STORAGE FACILITY, RECLAIM POND AND WASTE ROCK STORAGE FACILITIES

During the operations phase of the project, water quality monitoring is conducted from the tailings storage facility and reclaim pond and waste rock storage facilities.

The tailings storage facility and reclaim pond became operational as of February 2010. Water from the tailings reclaim pond was sampled during the open water season and analyzed for water quality as per the requirements in the NWB water license (sampling station ST-21). There are no applicable license limits for this data as the water has not been released into the environment; the data is presented in Table 7.6 for informational purposes only. Further information regarding the tailings storage facility is presented in Section 4.3.

The waste rock storage facilities have been in operation since 2009. Surface runoff and seepage at the waste rock storage facility was not observed in 2010; consequently, no samples were collected.

7.5 MINE SITE

Locations for water quality monitoring at the mine site include the Sewage Treatment Plant (STP), runoff water from the landfill, runoff water from the landfarm, and any runoff water collected in the secondary containment area of the bulk fuel storage tank that is discharged to land. The site layout is presented in Figure 1.

Sewage Treatment Plant

The Meadowbank mine site has one Seprotech L333 sewage treatment plant (STP) and two Little John 100 units in operation; the equipment operates together with one wastewater discharge stream. Samples of the discharge stream are collected weekly from a valve inside the STP building. Discharge from the sewage treatment plants is directed to stormwater management pond #1.

Water quality monitoring data from the STP wastewater discharge (called STP-Out) is presented in Table 7.7; the location of the sampling is highlighted on Figure 1. All of this data was previously reported to the NWB in the monthly monitoring reports. There are no applicable license effluent quality limits for this dataset; this data is being presented in the annual report for informational purposes only.

The total volume of wastewater discharge in 2010 is 32,481 m^3, with a total volume of sewage of 557 m^3. A monthly summary of the volume of STP waste is presented in Table 7.8.

Landfill

The Meadowbank Landfill #1 has been operational as of November 2008. A summary of the solid waste disposal activity for the site is presented in Section 5.2 above. Surface runoff and seepage at the landfill was not observed in the 2010 season; consequently, no samples were collected.

Landfarm

The Meadowbank landfarm is not yet constructed; consequently, there is no monitoring data to report for 2010.

Meadowbank Bulk Fuel Storage Facility

Runoff water in the secondary containment area of the bulk fuel storage tank at the Meadowbank mine site was sampled on June 22 and July 7, 2010 and analyzed for hydrocarbons and lead. The data is presented in Table 7.9; the sampling location (called Mb-fuel) is highlighted on Figure 1. No parameters exceeded the water quality limits stipulated in Part F, Item 6 in the water license. No water was discharged from the secondary containment area of the Meadowbank bulk fuel storage tank in 2010.

7.6 BAKER LAKE MARSHALLING FACILITIES

The design of the Baker Lake marshalling facility includes a number of facilities that have not yet been constructed; these include: two storage ponds to collect site precipitation runoff (east and west), an explosives storage area and an ammonium nitrate storage area. Consequently, no water quality monitoring of these facilities was conducted.

Runoff water in the secondary containment area of the bulk fuel storage facility is required to be sampled prior to discharge to the environment; this sampling station is identified as ST-40 in the NWB water license and called BL-fuel on Figure 3. Samples were collected on June 22 and July 8, 2010 and analyzed for metals and hydrocarbons. The data is presented in Table 7.10; all parameters met the maximum concentration of any single grab sample criteria stipulated in Part F, Item 23 of the water license.

The INAC inspector was notified on July 6, 2010 of the intent of AEM to discharge this water to the land; results from the June 22 sampling event were available at the time of the notification. AEM received a verbal approval from the inspector to discharge the water. Discharge of the runoff water to the land south of the secondary containment area began on July 10, 2010.

As part of the Core Receiving Environment Monitoring Program (CREMP), water quality samples are collected from Baker Lake. Three monitoring stations are sampled; one at the Baker Lake community barge dock, one at the Baker Lake jetty (used by AEM adjacent to the marshalling facility), and one upstream reference location. The jetty monitoring station meets the sampling requirements of ST-37. For more details, please refer to the report

entitled ‘’*Aquatic Effects Monitoring Program – Core Receiving Environment Monitoring Program 2010’* prepared for AEM by Azimuth Consulting Group, attached as Appendix F2.

7.7 ALL WEATHER PRIVATE ACCESS ROAD (AWPAR) AND QUARRIES

The construction of the AWPAR between the Hamlet of Baker Lake and the Meadowbank mine was completed on March 21, 2008. Monitoring along the AWPAR continued throughout the 2010 season to include water quality sampling along the road and in quarries, erosion and flow inspections, structural crossing inspections and fisheries studies.

The sampling design and results of the 2010 AWPAR and quarry water quality monitoring are available in the report entitled ‘*All Weather Private Access Road: 2010 Water Quality Management Report*’ prepared by AEM, attached as Appendix C1. Visual inspections to monitor erosion and sediment transport are included in this report.

A geotechnical structural inspection of the AWPAR, including all culverts, bridges and quarries, was conducted by Golder Associates in September 2010. The findings are presented in the report entitled ‘*2010 Annual Geotechnical Inspection, Meadowbank Gold Project, Nunavut*’, attached in Appendix A1.

The results of the 2010 AWPAR fisheries monitoring are available in the report entitled ‘*2010 All-Weather Private Access Road Fisheries Report’* prepared by AEM, attached as Appendix F3. This report includes the results and a discussion of the fisheries habitat compensation monitoring at bridge crossing R02.

7.8 SEEPAGE

As required by Water License 2AM-MEA0815 Part I, Item 16: ***The results and interpretation of the Seepage Monitoring program in accordance with Part I, Item 15***

The Seepage Monitoring program includes the following locations:

- **Lake water Seepage Through Dewatering Dikes;**
- **Seepage (of any kind) Through Central Dike;**
- **Seepage and Runoff from the Landfill(s);**
- **Subsurface Seepage and Surface Runoff from Waste Rock Piles;**
- **Seepage at Pit Wall and Pit Wall Freeze/Thaw; and**
- **Permafrost Aggradation.**

Lake water seepage through dewatering dikes

As mentioned in Section 2.1.1 c, the total seepage measured on the East Dike is estimated at 13 L/s or between 15 to 20 L/s, including non-measurable seepage. This represents about 400,000 to 600,000 m^3 per year or 35,000 to 50,000 m^3 per month.

A water sample was collected from the north sampling station (EDS-north) at the East dike on December 2, 2010 to measure water quality. In addition, routine turbidity sampling was performed at the East dike center sampling location (EDS-center) from July to October. There are no applicable license limits for this data; it is presented in Tables 7.11 and 7.12, respectively, for informational purposes only. The sampling locations are highlighted on Figure 1.

Seepage (of any kind) through Central Dike
Not applicable; construction of this dike will begin in 2011.

Seepage and runoff from the landfill:
See Section 7.5 above.

Subsurface seepage and surface runoff from waste rock piles
See Section 7.4 above.

Seepage at pit wall and pit wall freeze/thaw and permafrost aggradation
No seepage was observed in 2010.

7.9 GROUNDWATER

The results of the 2010 groundwater monitoring program are available in the report entitled '*2010 Groundwater Quality Monitoring Program, Meadowbank Mine'* prepared for AEM by Golder Associates, attached as Appendix F4.

7.10 RECEIVING ENVIRONMENT

The results of the 2010 core receiving environment monitoring program are available in the report entitled '*Aquatic Effects Monitoring Program – Core Receiving Environment Monitoring Program 2010'* prepared for AEM by Azimuth Consulting Group, attached as Appendix F2.

Representatives from the Department of Fisheries and Oceans requested AEM to complete a fish study around the freshwater intake barge in Third Portage Lake in order to confirm assumptions made for the Meadowbank mine site freshwater intake permit. This report, entitled '*Intake Barge Fisheries Study',* is attached in Appendix F5.

7.11 BLASTING ACTIVITIES

As required by NIRB Project Certificate No.004, Commitment 85: ***AEMP monitoring - monitor blasting peak particle velocity and overpressure in receiving environment; must use specific charge weight/delay/set back to meet DFO requirements.***

The detonation of explosives in or near water produces compressive shock waves that can cause significant impacts to the swim bladders of fish, rupture other internal organs and/or damage or kill fish eggs and larvae. In addition, the effects of the shock waves can be intensified in the presence of ice. Consequently, guidelines have been developed by DFO to protect fish and fish habitat from works or undertakings that involve explosives in or near fisheries waters. These guidelines are presented in the DFO report entitled "Use of Explosives In or Near Canadian Fisheries Water", and include the following:

- No explosive is to be detonated in or near fish habitat that produces an instantaneous pressure change (IPC) greater than 100 kPa in the swim bladder of a fish; representatives from DFO have mentioned to AEM that a value of 50 kPa is more appropriate instead of 100 kPa; and
- No explosive is to be detonated that produces a peak particle velocity greater than 13 mm/s in a spawning bed during the period of egg incubation (for lakes near the Meadowbank mine, the fisheries window is from August 15 to June 30).

Peak particle velocity (PPV) and overpressure monitoring data was recorded throughout 2010 during blasting activities at the North Portage Pit and South Portage pit. The location of the blast monitoring stations, called Portage (North) and Portage (South) is shown in Figure 1; results of the monitoring are presented in Table 7.13.

PPV concentrations exceeded the DFO criteria of 13 mm/s during the spawning season for 36 of the 300 blasts. IPC measurements were all well below the DFO criteria (50 kpa). The blast monitoring results are reviewed after each blast and the blast mitigation plan is implemented immediately if the vibrations or the overpressure exceed the guidelines. This plan includes a retroactive analysis to determine what caused the higher than expected results.

7.12 MMER AND EEM SAMPLING

The Meadowbank gold mine became subject to the Metal Mines Effluent Regulations (MMER) on January 1, 2010. There is one discharge location (named DD-FD1) from the TSS water treatment plants. This is the same discharge water that is sampled for the dewatering monitoring program. Water quality samples are collected weekly and acute toxicity samples monthly. The volume of water discharged to the environment is reported on a daily basis under the MMER monitoring program. Under the Environmental Effects Monitoring (EEM) program, AEM also collects sub-lethal toxicity and water quality samples four times per year from the discharge location, the receiving environment exposure area

(TPN [named TPL in the dewatering program]) and reference area (TPS). These sampling locations are highlighted on Figures 1 and 2. Results of the MMER and EEM monitoring programs are presented in Tables 7.14 and 7.15, respectively. This data was previously reported electronically to Environment Canada.

There were three exceedences of the MMER regulations, and one toxicity test failure; these events are discussed below:

- On April 7 the TSS concentration (58 mg/L) exceeded the regulatory limit. As a result of this exceedance, the TSS monthly mean (21 mg/L) also exceeded the regulatory limit. The TSS sample on April 7 was believed to have been contaminated during the collection process, as both actiflo water treatment plants were operating well within the limits (8 mg/L and 9 mg/L). As a mitigative measure, the technicians were given refresher training in best practices in sampling methodology. Chad Harden, the INAC inspector, was notified by telephone, and then with a follow up email on May 13, 2010.
- In June the TSS monthly mean (22 mg/L) exceeded the regulatory limit. The sampling methodology at the water treatment plants was revised to ensure a representative sample of the discharge water is collected. It was believed the former water collection system at the plant had allowed TSS to collect in the pipe joints and valves, erroneously elevating the TSS concentrations in the water quality monitoring samples.
- On July 21 the pH was lower (5.85 units) than regulatory limits. This was a laboratory measured value. As of September 1, all reported pH values are field measurements, which is a more accurate method to measure pH.
- On March 3 the Daphnia magna acute toxicity test failed with an LC50 of 46.19%. No mitigative measures were implemented, as the Rainbow trout acute toxicity test had an LC50 > 100%.

7.13 QAQC SAMPLING

The objective of quality assurance and quality control (QA/QC) is to assure that the chemical data collected are representative of the material being sampled, are of known quality, are properly documented, and are scientifically defensible. Data quality was assured throughout the collection and analysis of samples using specified standardized procedures, by the employment of accredited laboratories, and by staffing the program with experienced technicians.

All chemical analyses were performed by Multi-Lab Direct in Val d'Or, Quebec. All data from Multi-Lab underwent a vigorous internal QAQC process, including the use of spiked samples and duplicate samples. All QAQC data passed the laboratories acceptable limits. The laboratory Certificates of Quality Control are presented in Appendix F1, following the corresponding Certificates of Analysis.

All toxicity tests were performed by Maxxam Analytique in Quebec City. Testing was conducted as stipulated in the corresponding Environment Canada Biological Test Methods. QAQC measures implemented by the lab, including the use of reference toxicants, met the acceptable limits. QAQC data is presented with the toxicity reports in Appendix F1.

Duplicate field water quality samples were collected throughout the year from the various monitoring programs to assess sampling variability and sample homogeneity. The following presents the percentage of duplicate samples collected from each of the monitoring programs:

- MMER and EEM monitoring programs: 6 duplicate samples were collected from a total of 56 samples, representing 10.7%.
- Dewatering monitoring program: 21 duplicate samples were collected from a total of 490 samples, representing 4.3%.
- STP monitoring program: 2 duplicate samples were collected from a total of 51 samples, representing 3.9%.
- Surface water monitoring programs: 3 duplicate samples and 2 field blanks were collected from a total of 10 samples, representing 30%.

This represents approximately 5.3% of the samples collected, which is lower than the QAQC program objective of 10%. A more thorough QAQC sampling program has been implemented to ensure all QAQC data is collected in the future.

Analytical precision is a measurement of the variability associated with duplicate analyses of the same sample in the laboratory. Duplicate results were assessed using the relative percent difference (RPD) between measurements. The equation used to calculate a RPD is:

RPD = (A-B)/ ((A+B)/2)*100; where: A = analytical result; B = duplicate result.

RPD values may be either positive or negative, and ideally should provide a mix of the two, clustered around zero. Consistently positive or negative values may indicate a bias. Large variations in RPD values are often observed between duplicate samples when the concentrations of analytes are very low and approaching the detection limit. Consequently, a RPD of 50% for concentrations that exceed 10x the method detection limit (MDL) is considered acceptable.

Results for the QAQC data are presented in Tables 7.16 to 7.19 for the MMER and EEM, Dewatering, STP and Surface Water monitoring programs, respectively. None of the parameters exceeded the data quality objectives (RPD>50% for concentrations >10x MDL). Several parameters exceeded the 50% RPD value, but were not 10x the MDL; consequently those samples are considered acceptable. The data indicates there was good corroboration between the field duplicates and that data quality is sufficient to meet the objectives of the monitoring programs.

For field measurements, the following equipment is used:

- Hanna Multi-Parameter Meter (pH, Dissolved Oxygen, Conductivity and Temperature);
- Hoskin Scientific 340l pH Meter (pH); and
- Analite NEP 160 Meter (Turbidity).

The calibration data are presented in Tables 7.20, 7.21 and 7.22 for the Hanna, Hoskin and Analite meters, respectively. While the meters were calibrated prior to each use, the data from several calibration events are missing from the records. A more thorough reporting process has been implemented to ensure all QAQC data is reported in the future.

QAQC methods and results for specific field programs are discussed separately in their respective reports; these field programs are presented in the Appendices listed below:

- Appendix A3: *Aquatic Effect Monitoring Program – Targeted Study: Dike Construction TSS Effects Assessment Study 2010* – Sections 2.6 and 3.1
- Appendix A4: *2010 Causeway and Dike Construction Monitoring Report* – Sections 2.8 and 3.5
- Appendix C1: *All Weather Private Access Road: 2010 Water Quality Management Report* – Section 5
- Appendix F2: *Aquatic Effects Monitoring Program: Core Receiving Environment Monitoring Program 2010* – Sections 2.8 and 3.1
- Appendix F4: *2010 Groundwater Quality Monitoring Program* – Sections 2.5 and 3.2
- Appendix F6: *2010 Fish-Out of the Bay-Goose Basin in Third Portage Lake* – Sections 2.5 and 3.3.3

7.14 WATER USAGE

The volume of freshwater pumped from the surrounding lakes and used for the Meadowbank Gold Project is presented in Table 7.23. A total volume of 1,148,505 m^3 of freshwater was used for the project in 2010. This volume exceeds the 2AM-MEA0815 water license limit of 700,000 m^3 per year; an amendment to increase the volume of freshwater allowed for use will be requested in the second quarter of 2011.

The volume of reclaim water used in the mill in 2010 is 2,067,095 m^3. The volume of freshwater that came with the ore to the mill in 2010 is 27,735 m^3.

7.15 FISH-OUT PROGRAM SUMMARY

As required by NIRB Project Certificate No.004 Commitment 49: ***develop, implement and report on the fish-out programs for the dewatering of Second Portage Lake, Third Portage Lake and Vault Lake.***

The Fish-out of the Third Portage Lake impoundment area was completed in 2010. A summary of the program is available in the report entitled *'2010 Fish-out of the Bay Goose Basin in Third Portage Lake'* prepared for AEM by North/South Consultants Inc., attached as Appendix F6.

7.16 CREEL SURVEY RESULTS

As required by DFO Authorization NU-03-0190 (AWPAR) Condition 5.2.4: ***Engage the local Hunter Trapper Organization(s) in the development, implementation and reporting of annual creel surveys within the water bodies affected by the Plan.***

And

NIRB Project Certificate No.004 Condition 51: ***engage the HTOs in the development, implementation and reporting of creel surveys within waterbodies affected by the Project to the GN, DFO and local HTO.***

The results of the creel survey are available in Section 4 of the report entitled *'2010 All Weather Private Access Road Fisheries Report'* prepared by AEM, attached as Appendix F3.

SECTION 8 • CLOSURE

8.1 PROGRESSIVE RECLAMATION

8.1.1 Mine Site

As required by Water License 2AM-MEA0815 Schedule B, Item 16: ***A summary of any progressive closure and reclamation work undertaken including photographic records of site conditions before and after completion of operations, and an outline of any work anticipated for the next year, including any changes to implementation and scheduling.***

No restoration work was completed in 2010.

8.1.2 AWPAR

As required by INAC Land Lease 66A/8-71-2, Condition 33: ***The lessee shall file annually a report for the preceding year, outlining ongoing restoration completed in conformity with the approved Abandonment and Restoration Plan, as well as any variations from the said Plan.***

And

As required by KIA Right of Way KVRW06F04, Condition 26: ***File annually a progress report for the preceding year, outlining any ongoing restoration completed, in conformity with the Abandonment and Restoration plan***.

No restoration work was completed in 2010.

8.1.3 Quarries

As required by INAC Land Lease 66A/8-72-2, Condition 33: ***The lessee shall file annually a report for the preceding year, outlining ongoing restoration completed in conformity with C&R Plan, as well as any variations from the said Plan.***

No restoration work was completed in 2010.

8.2 RECLAMATION COSTS

8.2.1 Project Estimate

As required by Water License 2AM-MEA0815 Schedule B, Item 18: ***An updated estimate of the current restoration liability based on project development monitoring, results of restoration research and any changes or modifications to the Appurtenant Undertaking.***

And

As required by NIRB Project Certificate No.004, Condition 80: ***File annually with NIRB's Monitoring Officer an updated report on progressive reclamation and the amount of security posted, as required by KivIA, INAC, and/or the NWB.***

No restoration work was completed in 2010. Estimates of current restoration liability and the amount of security posted for the project are the same as was approved by the NWB in July 2008 (at the time of license issuance).

8.2.2 AWPAR and Quarries

As required by INAC Land Lease 66A/8-71-2, Condition 19: ***The lessee shall submit to the Minister every two years after the commencement date of this lease (January 2007), a report describing any variations from the Abandonment and Restoration Plan and updated cost estimates.***

And

As required by INAC Land Lease 66A/8-72-2, Condition 37: ***The lessee shall submit to the Minister every 2 years after the commencement date of this lease (January 2007), a report describing cumulative variations from the C&R Plan with updated cost estimates.***

And

As required by KIA Right of Way KVRW06F04, Condition 14: ***Submit to KIA every two years on each anniversary of the commencement date (February 2007), a report describing any variations from the Abandonment and Restoration Plan and updated cost estimates.***

No progressive reclamation has been completed on the AWPAR or associated quarries. Closure activities are consistent with the '*AEM Closure and Reclamation Plan, September 2008*', and original cost estimate.

SECTION 9 • PLANS / REPORTS / STUDIES

9.1 SUMMARY OF STUDIES

As required by Water License 2AM-MEA0815 Schedule B, Item 19: ***A summary of any studies requested by the Board that relate to Waste disposal, Water use or Reclamation, and a brief description of any future studies planned.***

One study was commissioned by AEM in 2010. The report, entitled "*Aquatic Effects Monitoring Program – Targeted Study: Dike Construction TSS Effects Assessment Study 2010*" is included with this annual report as Appendix A3.

9.2 SUMMARY OF REVISIONS

As required by Water License 2AM-MEA0815 Schedule B, Item 20: ***Where applicable, revisions will be completed as Addendums, with an indication of where changes have been made, for Plans, Reports, and Manuals.***

Appendix G1 includes a brief description of revisions for the following plans submitted to the Board in 2010:

- Aquatic Effects Management Program (AEMP); v1; May 2010;
- Core Receiving Environment Monitoring Program (CREMP) 2010 Plan Update; June 2010;
- Water Quality Monitoring and Management Plan for Dike Construction and Dewatering; v4; April 2010;
- Fish-Out Program; v2; June 2010;
- Environmental Effects Monitoring (EEM): Cycle 1 Study Design; December 2010;
- Transportation Management Plan: All Weather Private Access Road; v2; May 2010; and
- Blast Monitoring Program; May 2010.

9.3 EXECUTIVE SUMMARY TRANSLATIONS

As required by Water License 2AM-MEA0815 Schedule B, Item 21: ***An executive summary in English, Inuktitut and French of all plans, reports, or studies conducted under this Licence.***

Appendix G1 includes an executive summary in English, French and Inuktitut for the following documents.

1. All monitoring and management plans listed in Section 9.2 above.

2. Reports or studies submitted to the Nunavut Water Board, Environment Canada and Department of Fisheries and Oceans in 2010:

- 2009 East Dike Mitigative Works and As-Built Drawings
- 2009 Geotechnical Inspection Report
- 2009 Independent Geotechnical Expert Review Panel 2009 Reports
- All Weather Private Access Road (AWPAR): 2009 Water Quality Management Report
- AEMP – Core Receiving Environment Monitoring Program (CREMP) 2009
- 2009 All Weather Private Access Road Fisheries Report
- 2009 Groundwater Monitoring Program
- AEMP - Targeted Study: Second Portage Lake TSS Effects Assessment Study; June 2009
- Aquatic Effects Monitoring Program – Habitat Compensation Monitoring 2009
- Aquatic Effects Monitoring Program - Addendum to the 2008 Fish-out of the Northwest Arm of Second Portage Lake: Habitat Mapping of the Northwest Arm of Second Portage Lake 2009
- AEMP – Targeted Study: Dike Construction TSS Effects Assessment Study 2009
- AEMP – Targeted Study: Dike Construction Monitoring 2009

3. Translations of plans, reports or studies outstanding from the 2009 Annual Report:

- Water Management Plan; July 2009
- Baker Lake Fuel Storage Facility Environmental Performance Monitoring Plan; v1
- Meadowbank Fuel Storage Facility Environmental Performance Monitoring Plan; v1
- Detailed Plans for Tier 2 and Tier 3 Habitat Features Compensation Monitoring, March 2009
- Water Quality and Flow Monitoring Plan; v2; May 2009
- Groundwater Monitoring Plan; v2; March 2009
- Quality Assurance / Quality Control (QAQC) Plan; January 2009

SECTION 10 • MODIFICATIONS / GENERAL / OTHER

10.1 MODIFICATIONS

As required by Water License 2AM-MEA0815 Schedule B, Item 12: ***A summary of modifications and/or major maintenance work carried out on all water and waste related structures and facilities.***

There were no modifications to water or waste related structures or facilities in 2010.

10.2 INSPECTIONS AND COMPLIANCE REPORTS

As required by Water License 2AM-MEA0815 Schedule B, Item 22: ***A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector.***

Four water use inspections were conducted by INAC inspectors in 2010 (Jan 18-19, March 16, July 21-23, and November 13-14). Two reports were received from these inspections; both are provided in Appendix H1.

The major finding of the first inspection was the on-ice drilling. AEM is required to show that no sludge re-enters the lake and that the return water is proven non-toxic. AEM consequently made changes to the drills to manage the water in a closed circuit. Four drills are running with the new system and recirculating their water. No water from these drills is discharging into the lake.

Environment Canada conducted an inspection (July 19-21). No report was submitted.

DFO conducted an inspection (August 16-18). No report was submitted.

10.3 NON-COMPLIANCE ISSUES

As required by NIRB Project Certificate Condition 4: ***Take prompt and appropriate action to remedy any noncompliance with environmental laws and regulations and/or regulatory instruments, and shall report any non compliance as required by law immediately and report the same to NIRB annually.***

Water Usage: (see Section 7.14 for further details)

- A total volume of 1,148,505 m^3 of freshwater was used for the project in 2010, exceeding the water license limit of 700,000 m^3 per year.

Dewatering Monitoring Program: (see Section 7.2 for further details)

- On June 18 the 24-hour mean TSS concentration (32 mg/L) exceeded the license criteria.
- The 30-day mean TSS concentrations marginally exceeded the regulatory limit on June 27, 28 and 30 (15.3 mg/L to 15.5 mg/L). On July 2 and 3 the 30-day mean TSS concentrations (15.1 mg/L) continued to marginally exceed the license limit.
- On July 20 the 24-hour mean TSS concentration (36 mg/L) exceeded the license criteria.
- On August 19 the 24-hour mean TSS concentration (65 mg/L) exceeded the license criteria.

Environment Canada - MMER Regulations: (see Section 7.12 for further details)

- On April 7 the TSS concentration (58 mg/L) exceeded the regulatory limit. As a result of this exceedance, the TSS monthly mean (21 mg/L) also exceeded the regulatory limit.
- In June the TSS monthly mean (22 mg/L) exceeded the regulatory limit.
- On July 21 the pH was lower (5.85 units) than regulatory limits.

Environment Canada – Environment Emergency Regulations:

- On October 26, 2010 AEM received a written warning from Chad Harden, an Enforcement Officer of Environment Canada, regarding the Canadian Environmental Protection Act, 1999, Environmental Emergency Regulations. AEM was in breach of Schedule 2 of these regulations by not having notified the ministry of the presence of substances listed on Schedule 1 (propane and hydrochloric acid) on site in excess of the volumes stipulated in the regulations. On January 13, 2011, EC confirmed that AEM is now in full compliance with this regulation.

10.4 PUBLIC CONSULTATION

As required by Water License 2AM-MEA0815 Schedule B, Item 23: ***A summary of public consultation and participation with local organizations and the residents of the nearby communities, including a schedule of upcoming community events and information sessions.***

A log of 2010 public consultation activities is included in Appendix H2.