Appendix 15

Meadowbank and Whale Tail MDRB Report No 31

February 13th, 2024

Mr. Alexandre Cauchon
General Manager
Agnico–Eagle Mines, Meadowbank Division
Baker Lake Office

Email: alexandre.cauchon@agnicoeagle.com

Dear Mr. Cauchon,

Report No 31
Meadowbank Mine Dike Review Board (MDRB)
Site visit August 16th to 18th, and Montreal meeting December 6th and 7th, 2023.

1.0 INTRODUCTION

A site visit was made by the MDRB from August 16th to August 18th, 2023. Both Board members: Kevin Hawton and Anthony Rattue participated in the visit and the on-site meetings. The objective of completing a site visit and receiving some background data pertaining to Meadowbank and Amaruq sites was achieved. This was intended to be an introduction to the more in-depth discussions at an in-person meeting held on December 6th and 7th, 2023.

The material presented and discussed during the visit, covered current operations, activities performed in response to previous Board recommendations, and an introduction to the activities related to mine closure planning.

On-ground visits were made at the sites and a helicopter flyover was also carried out during the return flight from Amaruq to Meadowbank.

The main material covered at the December in-person meetings in Montreal included Meadowbank dewatering dike performance, tailings dike performance, Amaruq water management infrastructure performance, and a status update on the closure activities.

This report covers both the on-site meetings and the discussions pertaining to the presentations made in Montréal, related to the current operations and facility performance. This final version includes minor comments from AEM received on February 10th.

Lists of persons having participated in both the August site visit and Montreal meetings are included in Appendix A and a selection of photographs from the site visit is included in Appendix B.

A brief summary of the subject matter and comments are presented in the following sections. The Board's recommendations are underlined in the text.

2.0 OPERATIONS

An overview of mine status, current operations and future potential was provided to the Board for information. Life of Mine (LOM) is currently envisaged as extending to mid-2027. A potential

scenario is currently being evaluated for a push-back in the IVR pit at Amaruq which, along with a continuation of underground operations, may prolong the LOM to mid-2028.

A presentation was made of the revised organizational chart, and this was updated again prior to the December 2023 meetings. The Board was impressed by the fact that the changes represent, to a large part, the professional advancement of various members of the team. This satisfies the aspirations of young (and perhaps not so young) professionals while maintaining core members to profit from their experience and intimate knowledge of the various infrastructure and site conditions. While some staff turnover is to be expected and succession planning is part of normal mine operations, the advantages of continuity are a significant benefit to AEM from a corporate standpoint, accompanied by benefits to maintaining dam safety.

3.0 RECOMMENDATION FOLLOW-UPS

The Board endeavours to provide constructive feedback and recommendations in all of its reports and, despite the fact that there is no obligation to carry out these recommendations, AEM is consistently responsive to the suggestions made. A presentation was made of the responses to the previous report which enabled the Board members to observe the results first-hand during the visit.

AEM receives additional input from the reports submitted following the Annual Geotechnical Inspection carried out by the engineering consulting firms and the periodic Dam Safety Review of which one was performed in 2022. Of course, some field work is initiated by AEM as a result of their regular surveillance and monitoring.

The following points were noted for the Amaruq site.

Improvements have been made to the Whale Tail Dike, an important component of water management at the site. Thermal berms have been added to the west and east abutments (Photos #7 and #8) on the lake side to encourage regeneration of frozen ground as this contributes to upstream slope stability and maintaining the seepage control measures of the Dike. Following poor drainage performance at the toe of the Dike during freshet 2023, the toe access road has been raised and reprofiled, the seepage collection trench has been remediated, and a SeaCan shelter has been added to the main weir for seepage monitoring. A piezometer installed in the culvert (Photo #9) enables continuous recording of flow rates for the collected seepage. However, given the significant run-off catchment area downstream of the dike, visual observation of conditions and rainfall/temperature measurements are required for interpretation of the measurements. Ice accumulation could also affect the piezometer readings but access to the weir is improved by the shelter. The current system provides a somewhat accurate means of documenting total seepage through the Dike (during low precipitation periods), however it is more suitable to identifying significant changes in the seepage rates that may be indicative of a problem with the Dike.

During freshet, the alert level was temporarily raised for the saline ditch (Photo #11) around the stockpile of underground sourced rock until a clean-out operation was carried out. No spill was recorded, but maintenance procedures will be enhanced in future years.

For the Meadowbank site, a few observations such as cracks and shallow sloughing on slopes, were made during the “fresh eyes” inspection that formed part of the Dam Safety Review. Most, if not all, had been previously identified by the AEM team, were under surveillance, and are not deemed to constitute any threat to the integrity of the structures. The Board concurs.

At the Storm Water Dike (SWD) a few repairs have been carried out on the exposed upper parts of the geomembrane liner. Fine and coarse filter protection, as suggested by the Board, have been added over the geomembrane in advance of the rockfill closure cover (Photo 19).

A rockfill berm has been added to the toe of the North Cell Internal Structure (Photos #22 and #23) to alleviate local erosion from seepage and local run-off flows.

Additional maintenance work was planned for the crest of the Bay-Goose Dike to facilitate surveillance and it is understood that this work was completed between the site visit and the December 2023 meetings.

4.0 PROGRESSIVE CLOSURE

Work has been carried out over the last year with a view to continuing the plan for progressive closure of some of the mine facilities. The following areas were observed by the Board during the visit.

Rockfill berms that were previously constructed to assist with reclaim water management in the North and South Cells (NC and SC) of the Tailings Storage Facility (TSF) at Meadowbank, were upgraded to provide improved filtering capabilities (Photos #16 and #17). The performance of these berms will be monitored during upcoming operations to verify their improved effectiveness.

An extension of the North Cell Internal Structure adjacent to Saddle Dam SD1 has been constructed to prevent contact water and/or tailings from reaching the West Diversion Ditch whenever additional tailings deposition is made in the NC.

At SD1, the downstream toe area has been backfilled to reduce water accumulation from precipitation or snowmelt.

In addition to protection being added to the exposed liner on the upstream crest of the Stormwater Dike, placement of rockfill as capping on the NC is ongoing. (Photos #20 and #21) The Board members observed this work and wish to comment on the fact that the lift thickness of the rockfill is more than 2 m, and the manner in which some material, at least, is dumped directly over the advancing face is conducive to segregation. Thinner lifts insofar as is possible according to the bearing capacity of the tailings would be preferable. The placement methods and the resulting stratification of whatever sequence is obtained should be consistent with the intended cover performance strategy adopted for closure.

At the time of the visit, no “landscaping” deposition had been carried out in the NC or the SC of the TSF in 2023. The Board noted the irregular surface of the SC adjacent to the SWD (Photo #18) and agrees that continuation of warm weather deposition is appropriate to prepare the final tailings surface for NPAG capping rockfill.

5.0 STRUCTURE PERFORMANCE

5.1 Generalities

At the time of the on-site meetings, the Board suggested that thought be given to providing additional information to complement the graphs of evolution of piezometric readings and thermistor readings. The Board acknowledges that an effort has already been made to include cross-sections to illustrate the location of instruments, however inclusion of data such as ambient temperatures, pond levels, and precipitation would greatly facilitate interpretation of the results and permit trends to be associated with or dissociated from outside influence. This should ideally be completed for the interpretative and diagnostic work by AEM and their consultants and not solely for the presentations to the Board.

The following sections cover the information as presented at the December meeting.

The Board was advised that 2023 was notable for being warmer than average and with lower precipitation, however there was little manifestation of any impact on the instrument readings with the possible exception of a thermistor chain at Vault Dike.

There is, in general, an ongoing comprehensive inspection and monitoring program that AEM will attempt to optimize for efficiency. The Board concurs with this direction and assumes that AEM will adjust, for example, frequencies of inspections with due consideration of external inputs such as meteorological conditions and freshet, as well as the actual performance at any point in time.

5.2 Dewatering Dikes

East Dike and Bay-Goose Dike are performing satisfactorily with an overall general cooling trend continuing in the thermistors. Winter conditions brought the now typical operational issues due to snow clearing and permafrost aggradation leading to ice build-up, increased pore pressures, and seepage bypassing the pump station (Seepage Station B) at the East Dike south channel. Some maintenance activities, including steaming of trenches and ice removal were carried out to aid in managing and collecting the seepage, however no overall deterioration of the situation is noted from previous years. In addition, culvert installation (easier steaming) and raising of the road were completed at toe of dike to aid in future operations. The crest levelling exercise for Bay-Goose Dike and South Camp dike was completed which will facilitate recognition of any further deformation/cracking. Some maintenance was also carried out at the East Dike south abutment, to remove an area that historically fills with water and possibly contributes to increased seepage in the area. It is to be noted that these three dikes will remain operational into the active closure period.

At Vault dike, the upstream toe is in contact with the water of Wally Lake. The temperature of the shallow water could have reached greater values as compared to previous years thus providing a possible explanation for the increased temperatures measured by the upper beads of TH-8 beneath the upstream rockfill berm and also by TH-5 that runs parallel to the liner in the cut-off trench, despite the fact that the annual lake level fluctuation is only in the tens of centimetres. The foundation below the downstream berm remains essentially frozen and the attenuation pond elevation has not yet risen to this level.

5.3 Tailings Dikes

Tailings management in late 2023 included some deposition (August 27 to September 22, 2023) into the South Cell of the Tailings Storage Facility (TSF) from the crest of Central Dike primarily for landscaping purposes. There may be similar operations in the North Cell in 2024 and again in the South Cell in 2025 but the details will be established in line with the closure plans as these are developed.

In general, the performance of Central Dike is satisfactory and the under-seepage that reports to the downstream pond continues to decline as noted from the winter baseline flowrate handled by the transfer pump station. There are a few unexplained instrument reactions/spikes such as the thermistor TH 873P3 and the piezometer PW 825P1-E. The thermistor has indicated temperature spikes of around 3° on three occasions since the water level in Pit A reached the instruments installation elevation. PW-825P1-E indicates a piezometric level that is greater than neighbouring instruments. Examination of the readings for the piezometers downstream of Stormwater Dike (SW D03-A) shows comparable order of magnitude changes. A connection through the talik zone beneath the South Cell has been surmised for some time and it is not beyond the realm of possibilities that a seepage pathway through fractured rock may exist. Furthermore, increased seepage inflow to the pond downstream of Central dike is noted whenever tailings deposition resumes in the South Cell. A malfunction such as calibration drift of the piezometer is also possible, and a replacement of the instrument could be envisaged. However, the thermistor and the piezometer are both located downstream of the West Haul Road and do not necessarily indicate an issue with central dike. The Board recommends continued surveillance based on neighbouring instruments with replacement/additional instruments only carried out if mobilization of a drill rig and instrument specialists are required elsewhere on the complex.

The Board was advised that WSP (Golder) has been engaged to perform studies relating to the stability of Central Dike (both in terms of slope stability and internal erosion) as may be deduced from instrument readings. The conditions may be affected by the rising water level in pit A and directives as to the future target elevation for the downstream pond are required. The Board comments that numerical simulation of seepage flows may provide only an approximate portrait of the situation given the complex geological and hydrogeological conditions. Nevertheless, sensitivity analyses could assist with the judgement of instrumentation adequacy and provide performance indicators.

The performance of the Saddle Dams and Stormwater Dike (SWD) is also satisfactory. The “landscaping” tailings deposition in the South Cell has resulted in the maintenance of unfrozen conditions at the downstream toe of SWD.

Maintenance work has been carried out on Rockfill Structures RF-1 and RF-2 to reduce erosion, and infilling of the depression behind these structures was completed to reduce water management (i.e. pumping) and monitoring requirements. In addition, crest surface repairs were carried out at SD1 and SD2 to facilitate improved access, surface drainage and more efficient monitoring.

5.4 Amaruq

Satisfactory performance is noted for the Waste Rock Storage Facility Dike. This is a structure that merits attention (inspection frequency) as a function of the accumulation of water during freshet and any evolution in behaviour.

The situation at Mammoth Dike is stable particularly as pumping from the attenuation pond(s) is managed according to the dates of Mammoth Lake outlet thawing. Perhaps, if not already in place, it would be advisable to have contingency plans laid out should a rainfall storm event occur prior to the channel opening.

The IVR Dike status is stable with little or no observable additional settlement of the crest. Some surficial slope movement, potentially related to local permafrost degradation has however been noted.

The IVR Ditch functions as intended, however there may still be potential for permafrost degradation induced settlement of the ditch invert.

Performance of the South Whale Tail diversion channel is satisfactory and has required no maintenance beyond the snow and ice clearing in the spring.

The Saline Ditch required some remedial work in the spring due to inadvertent accumulation of debris, snow and ice over the winter. The situation is now under control, and operating protocols have been established.

As far as the Whale Tail Dike is concerned, the information presented revealed no adverse behaviour although several instruments exhibit fluctuations due to seasonal variations in meteorological conditions. Capture and gauging of seepage flow has been improved and an additional weir is planned. It appears to be too early to understand the impact of the abutment berms added last year on the upstream side to encourage aggradation of permafrost. In fact, a continued warming trend is noted from some instruments in the region. AEM does draw attention to the longer period of above 0°C air temperature in 2023. An additional berm on the downstream side of the east abutment is planned to mitigate the occurrence of minor slope movement/settlement and crest cracking that has occurred over the last year or so.

The Board supports the current work to establish alert/alarm levels for various instruments, particularly thermistors at critical locations, connected to the data acquisition system. For the moment, targets for peak values are sought though gradual development of the tool may include rate of change to cover the non-peak parts of the annual cycle where appropriate.

6.0 SUMMARY

In summary, the main points of the Board's deliberations are:

Additional data should be included on time evolution graphs of instrument readings to facilitate interpretation both for the Board but also for AEM internal analysis and reporting.

A review of closure concepts is needed to better inform the specifications and directions for the progressive closure capping work.

The performance of the water-retaining and tailings structures is satisfactory though seasonal variations in instrument readings are common and are to be expected. The Board concurs with the initiative to establish alert/alarm levels for instruments linked to the data acquisition system. The Board also agrees with the alignment to optimize the inspection frequencies though cautions that these should be flexible and the AEM team should be alert to conditions, meteorologic or behavioural, that could be cause for increased frequency.

There are a few unexplained instrument readings at Central Dike that justify the intended studies to better define performance criteria and water management orientation.

Seasonal variations at Whale Tail Dike illustrate that an equilibrium state has not yet been reached. The Board recognizes the efforts being made to improve the seepage water management and monitoring capabilities.

7.0 NEXT MEETINGS

The Board awaits information on the 2024 site visit, meetings and conference calls as may be deemed appropriate by AEM.

8.0 ACKNOWLEDGMENTS

The MDRB (Board) wishes to thank the AEM personnel for organizing the site visit and Montreal meeting which were highly successful and greatly appreciated.

Signed:

Kevin Hawton, P. Eng D. Anthony Rattue, P. Eng.

APPENDIX A

Appendix A-1

ATTENDANCE AT AUGUST 2023 SITE VISIT

Attendance		
Rebecca Cousineau	AEM	Closure Engineer
Manon Lahore	AEM	Coop Student
Patrice Gagnon	AEM	Water Management and Geotechnical Coordinator
Eric Haley	AEM	Superintendent Enviro and Critical Infrastructure
Michel Julien	AEM	V.P. Environment
Navjot Kanwar	AEM	Geotechnical Engineer
Thomas Lepine	AEM	EoR – Technical Specialist, Env. Management
Pier-Eric McDonald	AEM	Progressive Reclamation Coordinator
Pierre McMullen	AEM	General Superintendent (on-line)
Camille Pelletier	AEM	Water and Tailings Engineer
Erika Voyer	AEM	Mine Closure and Reclamation Lead Engineer
Kevin Hawton		Dike Review Board
Anthony Rattue		Dike Review Board

Appendix A-2

ATTENDANCE AT DECEMBER MEETING HELD IN MONTREAL

Attendance		
Luc Chouinard	AEM	Project Manager, Meadowbank Closure
Laurier Collette	AEM	Water Management and Geotechnical Coordinator
Rebecca Cousineau	AEM	Closure Engineer
Patrice Gagnon	AEM	Water Management and Geotechnical Coordinator
Eric Haley	AEM	Superintendent Enviro and Critical Infrastructure
Jessica Huza	AEM	Director, Environment and Operational Risks
Michel Julien	AEM	V.P. Environment (on-line)
Navjot Kanwar	AEM	Geotechnical Engineer
Thomas Lepine	AEM	EoR – Technical Specialist, Env. Management
Pier-Eric McDonald	AEM	Progressive Reclamation Coordinator
Pierre McMullen	AEM	General Superintendent (on-line)
Camille Pelletier	AEM	Water and Tailings Engineer
Jamie Quesnel	AEM	Director, Permitting and Regulatory Affairs
Erika Voyer	AEM	Mine Closure and Reclamation Lead Engineer
Vanessa Wanie	AEM	Water Management Specialist
Kevin Hawton		Dike Review Board
Anthony Rattue		Dike Review Board

APPENDIX B

SELECTED PHOTOGRAPHS

Photo #1 IVR Dike. Note low U/S pond level.

Photo #2 IVR Dike crest.

Cracks observed during surveillance.

Photo #3 IVR Diversion Ditch. Localized thaw settlement.

Photo #4 WRSF Dike. D/S area.

Photo #5 WRSF Dike. U/S area, little or no ponded water at time of visit.

Photo #6 Sump on south wall of Whale Tail Pit.

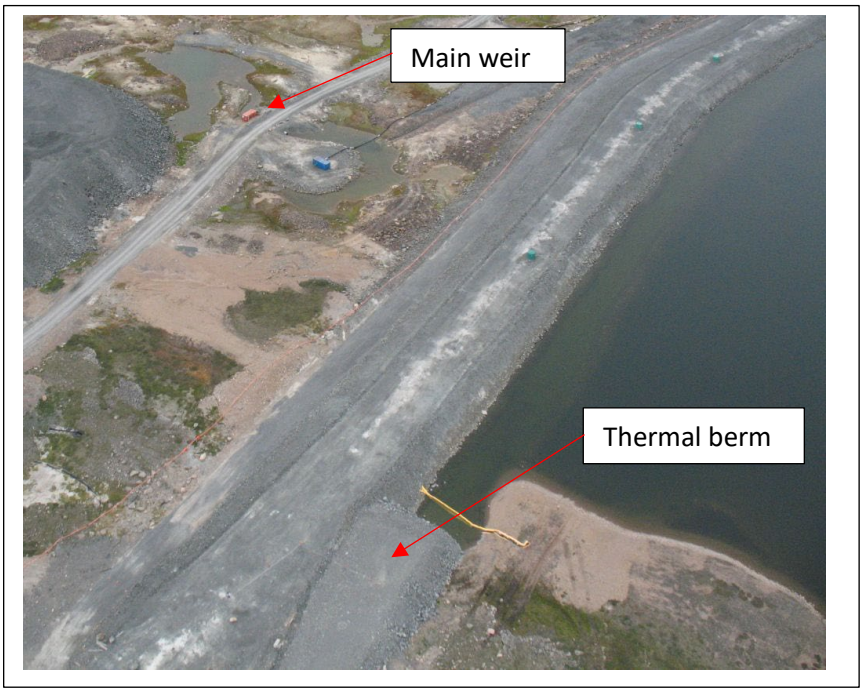

Photo #7 Whale Tail Dike west abutment area.

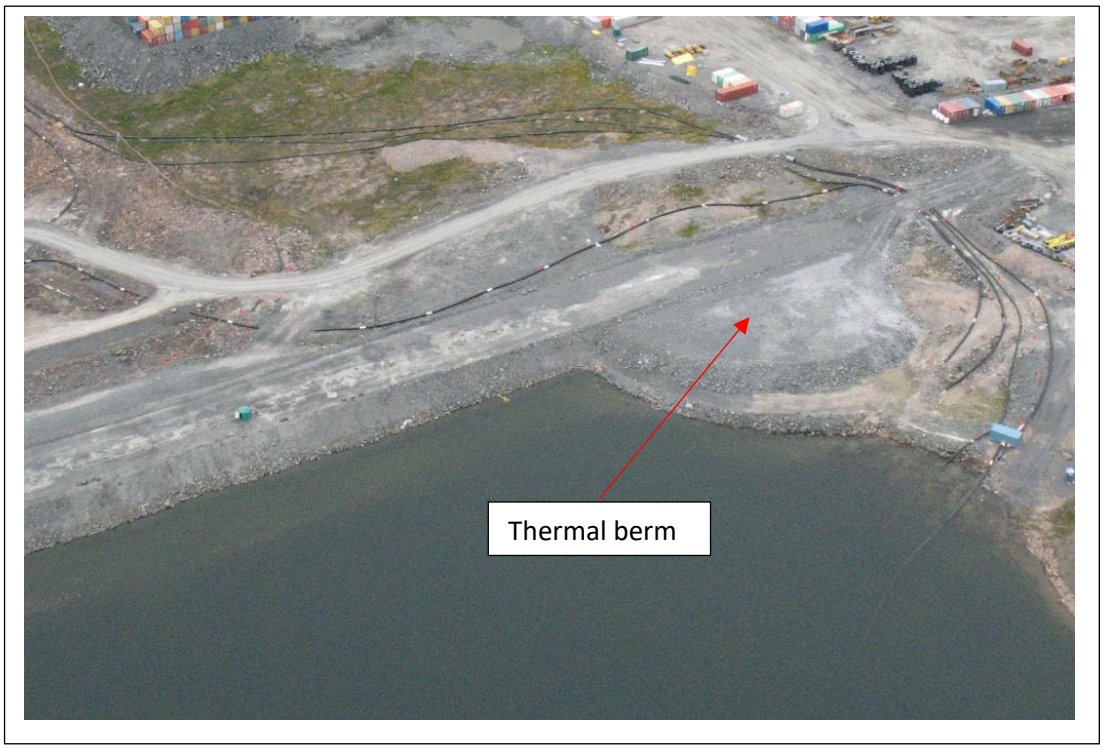

Photo #8 Whale Tail Dike, east abutment area.

Photo #9 Main weir at Whale Tail Dike.

Photo #10 Whale Tail Dike area of seeps not accumulated at main weir.

Photo #11 Saline ditch.

Photo #12 South Whale Tail Channel.

Photo #13 Saddle Dam SD1.

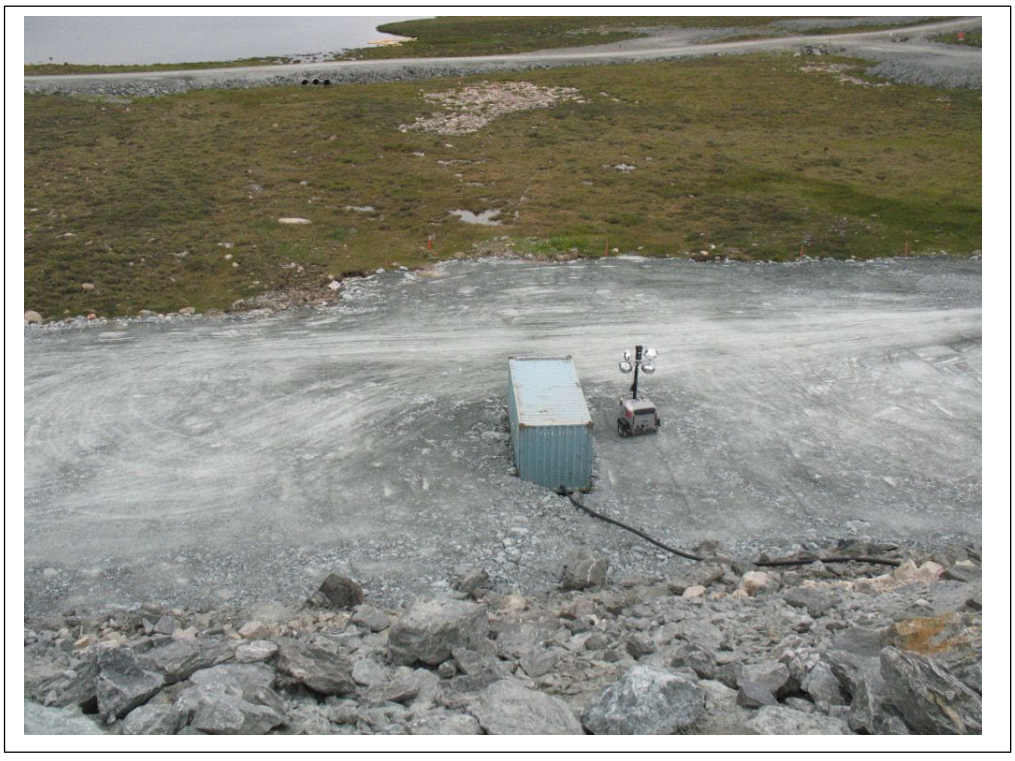

Photo #14 Pump station at toe of SD1.

Photo #15 Saddle Dams SD2 and SD3.

Photo #16 SD3, Stormwater Dike, and South Cell Reclaim Berm.

Photo #17 North Cell Reclaim Berm.

Photo #18 South Cell consolidation settlement and inflow areas that contribute to groundwater recharge.

Photo #19 Fine and coarse filter protection of Stormwater Dike geomembrane.

Photo #20 Progressive closure capping on North Cell of TSF.

Photo #21 Segregation in dumped rockfill.

Photo #22 North Cell Internal Structure (NCIS). Protective toe berm, looking south.

Photo #23 NCIS protective berm, looking north.

AGNICO EAGLE

To: D. Anthony Rattue and K. Hawton

From: Agnico Eagle Mines, Meadowbank, Nunavut Division

Date: March 21st, 2024

RESPONSE TO MEADOWBANK DIKE REVIEW BOARD – REPORT Nº 31

The thirty-first meeting between the Meadowbank Dike Review Board (the Board) and Agnico Eagle Mines Limited (AEM) was held December 6th and 7th, 2023, in Montreal. The objective of the meeting was to present and discuss the status of the operations and construction of Meadowbank Complex Critical Infrastructures for water and tailings management. The meeting covers all Meadowbank Complex sites including Vault and Amaruq and is conducted yearly. On-ground site visits and helicopter flyovers were also conducted for each site during a visit on August 16th to 18th, 2023.

On February 13th, 2024, the Board provided their report (MDRB Meeting Report 31), with recommendations. The present letter provides the response from AEM to the Board recommendations. All recommendations are detailed in the following table along with their associated location, AEM action plan, the recommendation status, and the anticipated action completion date. This table will be used by AEM to follow-up on each action throughout the year and to update the Board when the next MDRB meeting is held.

Best Regards,

Eric Haley
Environmental & Critical Infrastructure Superintendent
Meadowbank, Nunavut Division
Agnico Eagle Mines

MDRB 31 Recommendations and Action Plan

Recommendation Number	Location	Year	Recommendation	Action Plan/Follow-up	Status
MDRB#31-01	Whale Tail Dike	**2023**	However, given the significant run-off catchment area downstream of the dike, visual observation of conditions and rainfall/temperature measurements are required for interpretation of the measurements. Ice accumulation could also affect the piezometer readings but access to the weir is improved by the shelter. The current system provides a somewhat accurate means of documenting total seepage through the Dike (during low precipitation periods), however it is more suitable to identifying significant changes in the seepage rates that may be indicative of a problem with the Dike.	AEM agrees with the Board observation and data will be carefully analysed throughout the year taking into account the data collected by the weather station on site.	Closed
MDRB#31-02	General - Rockfill placement	**2023**	The Board members observed this work and wish to comment on the fact that the lift thickness of the rockfill is more than 2 m, and the manner in which some material, at least, is dumped directly over the advancing face is conducive to segregation. Thinner lifts insofar as is possible according to the bearing capacity of the tailings would be preferable. The placement methods and the resulting stratification of whatever sequence is obtained should be consistent with the intended cover performance strategy including either, “thermal”, to enhance permanent freezing of the tailings surface in order to both minimize infiltration and leaching from the tailings; or “saturation” whereby a finer layer of compacted rockfill is overlain by a coarser active layer to maintain the tailings in a saturated state.	As a standard and best practice since the Earthworks construction works have started at Mbk complex, during the rockfill placement, the load is not allowed to be dumped in the slope of a pad. The corrective measure was applied right after the field observation and AEM will continue to enforce this practice with the Contractor to make sure the material placement is optimal with the design intent for the infrastructures.	Closed
MDRB#31-03	General - Data Presentation	**2023**	At the time of the on-site meetings, the Board suggested that thought be given to providing additional information to complement the graphs of evolution of piezometric readings and thermistor readings. The Board acknowledges that an effort has already been made to include cross-sections to illustrate the location of instruments, however inclusion of data such as ambient temperatures, pond levels, and precipitation would greatly facilitate interpretation of the results and permit trends to be associated with or dissociated from outside influence. This should ideally be completed for the interpretative and diagnostic work by AEM and their consultants and not solely for the presentations to the Board.	AEM already incorporated the comment from the July visit in the December presentations. More efforts will be put in the future presentations to incorporate the different elements needed to aid in the interpretations of the instrumentation data. All the climate data is available live in our instrumentation data visualization software (VDV), is used on a regular basis for data interpretation, analysis and dashboards combining infrastructure data and climate data are created as needed.	Ongoing
MDRB#31-04	General - Inspections	**2023**	There is, in general, an ongoing comprehensive inspection and monitoring program that AEM will attempt to optimize for efficiency. The Board concurs with this direction and assumes that AEM will adjust, for example, frequencies of inspections with due consideration of external inputs such as meteorological conditions and freshet, as well as the actual performance at any point in time.	AEM will continue implementing the Surveillance Optimization program and will adjust the frequency to the changing site conditions whenever required.	Closed
MDRB#31-05	CD/West Road	**2023**	The Board recommends continued surveillance based on neighbouring instruments with replacement/additional instruments only carried out if mobilization of a drill rig and instrument specialists are required elsewhere on the complex.	AEM will continue analysing the instrumentation situation at CD and West Road and assess if the installation of new instruments is required.	Ongoing
MDRB#31-06	CD/West Road	**2023**	The conditions may be affected by the rising water level in pit A and directives as to the future target elevation for the downstream pond are required. The Board comments that numerical simulation of seepage flows may provide only an approximate portrait of the situation given the complex geological and hydrogeological conditions. Nevertheless, sensitivity analyses could assist with the judgement of instrumentation adequacy and provide performance indicators.	A sensitivity analysis on the water level on the downstream of the Central Dike is part of the SOW for the Central Dike & West Road assessment from WSP.	Closed
MDRB#31-07	Mammoth Dike	**2023**	Perhaps, if not already in place, it would be advisable to have contingency plans laid out should a rainfall storm event occur prior to the channel opening.	A TARP was already put in place in 2020 following a similar event as described in the Board comment. AEM mandated SNC Lavalin to simulate a couple of hydrological scenarios. From the result of this analysis AEM changed the Operational guidelines of the Mammoth Lake. A drone inspection of the outlet of the lake confirming the absence of ice is required before instigating the Mammoth discharge from FWTP at freshet.	Closed
MDRB#31-08	Closure	**2023**	A review of closure concepts is needed to better inform the specifications and directions for the progressive closure capping work.	AEM agrees. Studies are ongoing regarding the TSF cover at closure. Results will inform the design specifications moving forward with capping work.	Ongoing
MDRB#31-09	General - Instrumentation	**2023**	The performance of the water-retaining and tailings structures is satisfactory though seasonal variations in instrument readings are common and are to be expected. The Board concurs with the initiative to establish alert/alarm levels for instruments linked to the data acquisition system. The Board also agrees with the alignment to optimize the inspection frequencies though cautions that these should be flexible and the AEM team should be alert to conditions, meteorologic or behavioural, that could be cause for increased frequency.	AEM already started implementing the alarms to aid in the routine instrumentation follow-up and analysis. AEM will also evaluate and consider adding a rate of change to the alarms already in place to upgrade the efficiency of the instrumentation analysis.	Ongoing
MDRB#30-09	TSF	2022	As far as the downstream toe of the Stormwater Dike is concerned, the eastern end is characterized by a very uneven tailings surface (photo #8) and the western end by seasonally ponded water. All run-off (and supernatant water during tailings deposition) ultimately reports to the sump adjacent to SD-3. Consequently, there is a constant source of water to recharge the groundwater in the talik zone (remnant of 2nd Portage Lake). Water draining through this talik zone reports to the pond downstream of Central Dike. One of the aims in the water management plan is to minimize this flow. The Board recommends that consideration be given to relocating the sump further south, along a rock outcrop that could be a potential site for the spillway, and to deposit additional tailings along the toe of Stormwater Dike to encourage permafrost aggradation.	AEM agrees with the Board that additional tailings deposition along the downstream toe of Stormwater Dike should be considered; this will be examined in the new tailings deposition plan to be released in the upcoming months as mentioned in recommendation MDRB#30-4. Relocating the sump adjacent to SD-3 to be further south along the rock outcrop will be considered; however, given the topography of the area this may be a challenge. Moving the spillway to this location is being considered in the feasibility level TSF Closure Landform study. More information on this study will be provided to the Board during the next MDRB meeting.	Open
MDRB#30-12	East Dike	2022	The surface and seepage drainage has been improved; however, groundwater flow continues to by-pass the pump sump at certain times during the winter. The Board continues to support the hypothesis that the change in flow paths is associated with ground freezing. AEM has already acted upon the recommendation to enhance the drainage into the sump during the winter months so that ongoing monitoring of seepage rates can be continued.	AEM has continued working to fix the drainage to the sump pump at East Dike; the vertical collection culvert was partially excavated in early November and had additional drainage holes drilled into it. The East Dike flowmeter is also in the process of being replaced to prevent the erratic data seen in the past. Dec 2023 Update: further improvement to the drainage system around the pumping well has been completed during summer 2023. A trench along the access road at the toe of the dike and a crossing and overflow pipes were installed for easy steaming during winter. Jan 2024 update: There is an action plan in place to improve the flowmeter setup reliability	Ongoing
MDRB#30-15	Closure	2022	Under natural conditions (prevailing), there is a 1 m difference between 3rd Portage Lake and 2nd Portage Lake (photo #12). Consequently, when the area enclosed by East Dike and Bay-Goose Dike will be flooded at closure, a head difference may be created across East Dike in a direction opposite to the way for which it was designed and operated. The closure plans will have to consider this situation or the case including a breach in East Dike as well as in Bay-Goose Dike with the	The Closure team will be examining the pits flooding plan and the dike(s) breaching strategy in more detail as it ramps up the closure planning and studies in the upcoming year. AEM agrees on the potential of a breach in East Dike and that it may be the best way to deal with the head difference between 3rd Portage Lake and 2nd Portage Lake and will further assess the feasibility of this option.	Open

Recommendation Number	Location	Year	Recommendation	Action Plan/Follow-up	Status
			head difference occurring through the waste rock in Portage Pit. Alternate arrangements involving raising of the water level in 2nd Portage Lake may also be possible. It is understood that maintaining the current water level in 3rd Portage Lake will be a critical consideration.		
MDRB#30-18	WTD	2022	Some settlement, though of lesser magnitude, is observed on the downstream shoulder. The secant pile central cut-off is robust and the Board does not envisage a risk to dike integrity but the upstream remedial work should proceed without delay. The downstream East abutment area was noted to generally slope toward the toe of the dike. Regrading this area by fill placement would also minimize concentrated flows or water ponding against the toe, thus reducing the potential for further thermal degradation in this area.	AEM will evaluate whether there is water ponding or concentrated flow in that sector and if it requires mitigation. If its the case the possibility of regrading the downstream east abutment area of Whale Tail Dike will be examined. Dec 2023 Update: Remediation work is planned for 2024. Run-of-mine material will be added on the downstream side, on the East abutment, against the slope, to act as a buttress and for thermal encapsulation. The work will take place at the end of the winter.	Ongoing
MDRB#30-20	WTD	2022	AEM shares the Board's opinion that diligent monitoring of the behaviour of this structure including in-depth analysis of instrument data is warranted. A more intensive evaluation of the data related to the Whale Tail Dike performance is merited.	AEM is working on reviewing the instrumentation monitoring program to ensure that the instrumentation data related to Whale Tail Dike is still appropriate. Alerts will also be added to selected instruments to aid AEM in detecting changes in condition. Frequent structure inspections will be continued. An update on this initiative will be given during the next MDRB meeting. Dec 2023 update: an automated alerts program have been implemented for thermal data, as presented during MDRB31. AEM will also evaluate and consider adding a rate of change to the alarms already in place to upgrade the efficiency of the instrumentation analysis.	Ongoing
MDRB#30-22	TSF	2022	A re-arrangement of the SC of the TSF may be useful to reduce groundwater recharge and minimize seepage which exits at Central Dike.	AEM agrees that re-arranging the South Cell could be beneficial for water management, particularly for the Central Dike seepage. Additional tailings deposition needs to be performed at the South Cell to prepare the final tailings surface and high priority will be given to improving water management; more details to come on this with the new tailings deposition plan to be released in the upcoming months as well as the results of the ongoing study on the closure landform.	Ongoing
MDRB#29-09	Water Management	2021	The potential for advancing the construction of the permanent spillway between the NC and SC should be evaluated to permit some of the water transfer to be accommodated by gravity flow instead of pumping from the problematic collection sump.	The TSF Closure Landform study is ongoing and is looking at this opportunity. Details on this will be presented at the next MDRB meeting.	Ongoing
MDRB#29-12	Central Dike	2021	Discussions should be held with Golder to establish whether the range of operating levels in the Central Dike downstream pond could be widened to facilitate the pump operation.	As shared at MDRB#30, AEM is working on a proposal for Golder and the EOR for a stepped approach to increase the operating range of the CD D/S pond.	Ongoing