AGNICO EAGLE

MEADOWBANK GOLD PROJECT

2018 Annual Report

Prepared for:
Nunavut Water Board
Nunavut Impact Review Board
Fisheries and Oceans Canada
Crown-Indigenous Relations and Northern Affairs Canada
Kivalliq Inuit Association

Prepared by:
Agnico Eagle Mines Limited – Meadowbank Division

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ABBREVIATION

ABA	Acid base accounting
AEMP	Aquatic Ecosystem Monitoring Program
AP	Acid potential
ARD	Acid Rock Drainage
AWAR	All Weather Access Road
BA:	Before after
BL:	Baker Lake
CCBE:	Cover with capillary barrier effects
CCME	Canadian Council of Ministers of the Environment
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
CREMP	Core Receiving Environmental Monitoring Program
CSM	Conceptual Site Model
CWS	Canada-Wide Standard
DFO	Department of Fisheries and Oceans Canada
ECCC	Environment and Climate Changes Canada
EEM	Environmental Effect Monitoring
El.	Elevation
ERT	Emergency Response Team
FEIS	Final Environmental Impact Statement
FET	Full-time equivalent
F/T	Freeze/Thaw
GEMSS	Generalized environmental modelling system for surface water
GN	Government of Nunavut
GWMP:	Groundwater monitoring plan
HCMP	Habitat Compensation Monitoring Plan
HHRA	Human Risk Assessment
HHS	Hunter Harvest Study
HTO	Hunter Trapping Organization
INUG	Innuguguayalik Lake
IPC	Instantaneous pressure change
IOL:	Inuit owned land
IWBS	Inuit work barrier study
KIA	Kivalliq Inuit Association
KvSEMC	Kivalliq Socio-economic monitoring committee
LMA	Labour market analysis
LSA	Local Study Area
LSM	Learning Management System
LOM	Life of Mine
MAM:	Mammoth Lake
Masl.	Meters above sea level
MBK:	Meadowbank
MDL	Method Detection Limit
MDRB	Meadowbank Dike Review Board

MFRAG	Meadowbank Fisheries Research Advisory Group
MMP	Mercury monitoring plan
MPA	Maximum Potential Acidity
MDMER	Metal and Diamond Mining Effluent Regulations
NC	North Cell
NCIS	North Cell Internal Structure
NEM	Nemo Lake
NIRB	Nunavut Impact Review Board
NF	Near-Field
NML	Non metal leaching
NNLP	No Net Loss Plan
NP	Neutralization Potential
NPAG	Non-Potentially Acid Generating
NPC:	Nunavut Planning Commission
NPR	Net Potential Ratio
NRCan	Natural Resources Canada
NSERC-UQAT	National Science and Engineering Research Council – University of Quebec in Abitibi-Temiscamingue
NWB	Nunavut Water Board
OMS	Operation, Maintenance and Surveillance
PAG	Potentially Acid Generating
PAHs	Polycyclic Aromatic Hydrocarbons
PEAMP	Post-Environmental Assessment Monitoring Program
PDL	Pipe Dream Lake
PHC	Petroleum Hydrocarbon
PPE:	Protective personnel equipment
PRSF	Portage Waste Rock Storage Facility
PVV	Peak particle velocity
QAQC	Quality Assurance Quality Control
RDP	Relative Percent Difference
RIME	Research Institute in Mine and Environment
RSA	Regional Study Area
RSF	Rock Storage Facility
SSWQO	Site specific water quality objective
TAG	Terrestrial Advisory Group
TARP:	Trigger Action Response Plan
TDS	Total Dissolved Solids
TMS	Training Management System
TPL, TPN, TPE	Third Portage Lake
TS	Total Sulphur
TSF	Tailings Storage Facility
TSS	Total Suspended Solids
RIME	Research Institute of Mine and Environment
RSF	Rock Storage Facility
S	Total Sulphur
SC	South Cell
SEMP	Socio-economic monitoring program

SMP	Stormwater Management Pond
SEMR	Socio-economic monitoring report
SEMWG	Socio-economic monitoring working group
SPL, SP	Second Portage Lake
SPLE	Second Portage Lake Exposure
Sta.	Station
STP	Sewage Treatment Plan
SWD	Stormwater dike
VECs	Valued Ecosystem Components
VRWF	Vault Rock Storage Facility
WAL	Wally Lake
WEP	Waste Extension Pool
WLE	Wally Lake Exposure
WRSF	Waste rock storage facility
WSLRA	Wildlife Screening Level Risk Assessment
WT:	Whale Tail
WTD	Whale Tail Dike
WTHR:	Whale Tail haul road
WTP	Water Treatment Plan
WTS:	Whale Tail south
W/D	Wet/Dry

DOCUMENT CONTROL

Version	Date (YMD)	Section	Page	Comment
1	2019/04/08	All	All	This has been reviewed by Environmental Staff and will be incorporated into training for all mine staff on behalf of the Mine Manager and Senior Management

Prepared By: Meadowbank Environment Department

Approved By:

Nancy Duquet Harvey
Environmental Superintendent

SECTION 1. INTRODUCTION

The Meadowbank Gold Project operated by Agnico Eagle Mines Limited - Meadowbank Division is located approximately 70 km north of the Hamlet of Baker Lake, Nunavut. The Meadowbank gold mine began the operation phase of the project in February 2010, and thus, was in its nine year of operations in 2018.

Meadowbank Project, was first licensed by the NWB in 2008. The project involved the construction, operation, maintenance, reclamation, closure and monitoring of an open pit gold mine and milling facility at the Meadowbank mine site, and the processing plant achieved commercial production in March 2010. The original licence was subsequently renewed by the Board in August 2015 and was amended in July 2018 to reflect changes to the Project associated with additional tailings deposition and associated ore processing at the Meadowbank mine site from Agnico Eagle's new mining undertaking at the Whale Tail Pit site. The Project is governed by current Water Licence No: 2AM-MEA1526 (the Licence).

At present, the project components included in the scope of the Licence consist of the Meadowbank mine site and the Vault mine site, a Marshalling Facility in Baker Lake, and a 110 kilometre All-Weather Access Road between Baker Lake and the Meadowbank mine site. There are also water retention dikes constructed from mined waste rock to allow for the mining of ore beneath shallow dewatered lakes and a tailings storage facility (Second Portage Lake's northwest dewatered arm), where tailings have been deposited sub-aerially as slurry and water from the ponds reclaimed during operation. Waste rock is placed in separate Portage and Vault Waste Rock Storage Facilities.

In 2016, Agnico Eagle proposed to develop the Whale Tail Pit Project (Whale Tail Pit, Whale Tail Waste Rock Storage Facility, Whale Tail Attenuation Pond) to continue mine operations and milling at the Meadowbank Mine and extend the Meadowbank Mine to include development of resources from Whale Tail Pit. The Amaruq Exploration property is a 408 square kilometre (km^2) site located on Inuit Owned Land (IOL) approximately 150 kilometres (km) north of the hamlet of Baker Lake and approximately 50 km northwest of the Meadowbank Mine in the Kivalliq region of Nunavut. The deposit will be mined as an open pit, and ore will be hauled by truck to the approved infrastructure at Meadowbank Mine for milling.

The project was submitted to the NPC and on June 17, 2016, the review process was completed: previous conformity determinations provided still apply but as the project proposal is a significant modification, it was forwarded to NIRB for screening. On August 16, 2016, the NIRB issued a Screening Decision Report with the determination that the proposed project required further assessment best facilitated through a full environmental review. The NIRB technical assessment stage was initiated on November 25, 2016. In parallel with this, Agnico Eagle submitted its Project application to the NWB on July 8, 2016. The NWB technical assessment stage commenced on November 3, 2016.

A NIRB-NWB joint technical meeting and pre-hearing conference were held April 27 to May 2 2017 and final hearing and community roundtable were held September 19 to 22, 2017. NIRB's positive final hearing report was issued on November 6, 2017 and positive Ministerial Decision was received on February 15, 2018. On May 29, 2018, the NWB issued its Water Licence and Reasons for decision report and on July 11, 2018, positive Ministerial decision was received. On July 23, 2018, DFO's Fisheries' Act Authorization was provided to Agnico Eagle. This completed the permitting process for the Whale Tail Pit Project.

These various components and activities associated with the project require a number of different authorizations, leases and permits from regulatory agencies including the Nunavut Water Board (NWB), the Environment and Climate Changes Canada (ECCC) Metal and Diamond Mining Effluent Regulations (MDMER); the Department of Fisheries and Oceans Canada (DFO), Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC); the Kivalliq Inuit Association (KIA) and the Nunavut Impact Review Board (NIRB).

This report is written to address all of the 2018 annual reporting requirements of the project under these authorizations:

Meadowbank

NWB Type A Water License 2AM-MEA1526;
NIRB Project Certificate No. 004;
DFO HADD Authorization NU-03-190 AWAR;
DFO HADD Authorization NU-03-191 Mine Site;
DFO Authorization NU-14-1046 Phaser Lake;
CIRNAC Land Leases 66A/8-71-2 (AWAR) and 66A/8-72-5 (AWAR Quarries);
KIA Production Lease KVPL08D280; and
KIA Right of Way KVRW06F04.

Whale Tail

NWB Type A Water License 2AM-WTP1826;
NWB Type B Water License 2BB-MEA1828;
NIRB Project Certificate N0. 008
DFO HADD Authorization 16HCAA-00370;
CIRNAC Land Leases 66H/8-02-1 (Whale Tail Haul Road) and 66H/8-01-4 (Whale Tail Haul Road Quarries);
KIA Commercial Lease KVCL314C01;
KIA Quarry Lease KVCA15Q01, KVCA15Q02, KVCA17Q01, KVCA18Q01; and
KIA Right of Way KVRW15F01.

On October 3, 2018, Agnico sent to NWB applications to cancel the Type “B” Water Licences 8BC-AEA1525 (Amaruq Exploration Access Road Project) and 2BC-WTP1819 (Whale Tail Pit and Haul Road Site Preparation Project). The applications included a CIRNAC Inspector letter dated October 3, 2018, stating that *a final compliance inspection was conducted of water licence no. 8BC-AEA1525 and 2BC-WTP1819 between August 28 and 30, 2018. These licences were issued to Agnico Eagle Mines Limited (AEM) for operation and construction of the Amaruq exploration road and Whale Tail Pit /Haul Road. The inspector determined that conditions of the two licences have been met and understands from correspondence with the Nunavut Water Board that the components of the predevelopment licences will be covered by the type ‘A’ water licence no. 2AM-WTP1826, issued May 29th 2018. The inspector sees no reason to deny any application for the cancellation of licences 8BC-AEA1525 and 2BC-WTP1819 if requested by AEM.* On November 9, 2018, the NWB has cancelled the Water License 2BC-WTP1819 and 8BC-AEA1525. The current 2018 Annual Report cover all the annual reporting requirement from those cancelled licenses.

Reporting requirements for the MDMER have been submitted directly to Environment and Climate Changes Canada; results are presented herein to comply with the NWB Type A Water License.

Table 1.1 (Appendix 1) outlines each requirement by authorization and report section. Table 1.2 (Appendix 1) presents the status of each sampling stations stipulated in Part I, Schedule I of Water License 2AM-MEA1526 and 2AM-WTP1826 and Part J of Water License 2BB-MEA1828. Table 1.3 (Appendix 1) provide a list of commitment done by Agnico, following review by regulators of the 2017 Annual Report, to be incorporated in the 2018 Annual Report and well as the regulator's comment submitted to the NWB regarding the 2017 Annual Report.

SECTION 2. SUMMARY OF ACTIVITIES

2.1 2018 ACTIVITIES

Agnico Eagle's ability to consistently execute its business strategy has provided a solid foundation for growth. These three pillars – performance, pipeline and people – form the basis of Agnico Eagle's success and competitive advantage. By delivering on them, the Company strives to continue to build its production base and generate increased value for shareholders, while making meaningful contributions to its employees and communities.

For the seventh year in a row, Agnico Eagle operations exceeded their production targets in 2018. The company payable gold production for the full year of 2018 totaled 1,626,669 ounces of gold, with production costs per ounce of $713 total cash costs per ounce of $637 and all-in sustaining costs per ounce of $877, on a by-product basis.

The 2018 highlights for the Meadowbank Gold Project and Whale Tail Project include:

- During 2018, payable gold production at Meadowbank totaled 248,997 ounces at a production cost per ounce of $814. The mine also produced 170,696 ounces of silver in the year;

- Meadowbank produced its three millionth ounce of gold in 2018;

- Amaruq drilling enhances open pit mineral reserves and underground potential: At year-end 2018, Amaruq increased gold reserves by 500koz at open pit depths; and

- Meadowbank's retention rates and training of Inuit are continuing to show encouraging outcomes.

Meadowbank mine is expected to produce 65,000 ounces of gold in 2019 and the Gold production at Meadowbank is expected to end late in Q2 2019. The extension of the mine production at Meadowbank mine to mid-2019 will bridge the gap between the expected cessation of mining activities at Meadowbank in mid-2019 and the expected start of operations at Amaruq in Q3 2019. The additional production has come from an extension of the mine plan at the Vault and Phaser pits in 2018 and the Portage pit in 2018 and 2019, supplemented from stockpiles in 2018 and 2019.

Amaruq deposit remains on track for production start-up in Q3 2019: Development activities at Amaruq are progressing as planned. Open pit mining has commenced at the Whale Tail pit and commissioning of the long-haul truck fleet is underway.

Quarterly progress reports, providing further details of activities throughout the 2018 year, were prepared for the Kivalliq Inuit Association as required by Production Lease KVPL08D280.

Agnico infrastructure locations can be found in Figure 1, 2, 3, 4, 5 and 6.

Figure 1. 2018 Meadowbank Site Sampling Locations

Figure 2. EEM Receiving Environment Sampling Locations

Figure 3. Vault Area Sampling Locations

Figure 4 Whale Tail Area Sampling Locations

Figure 5. General View from Baker Lake to Whale Tail Project

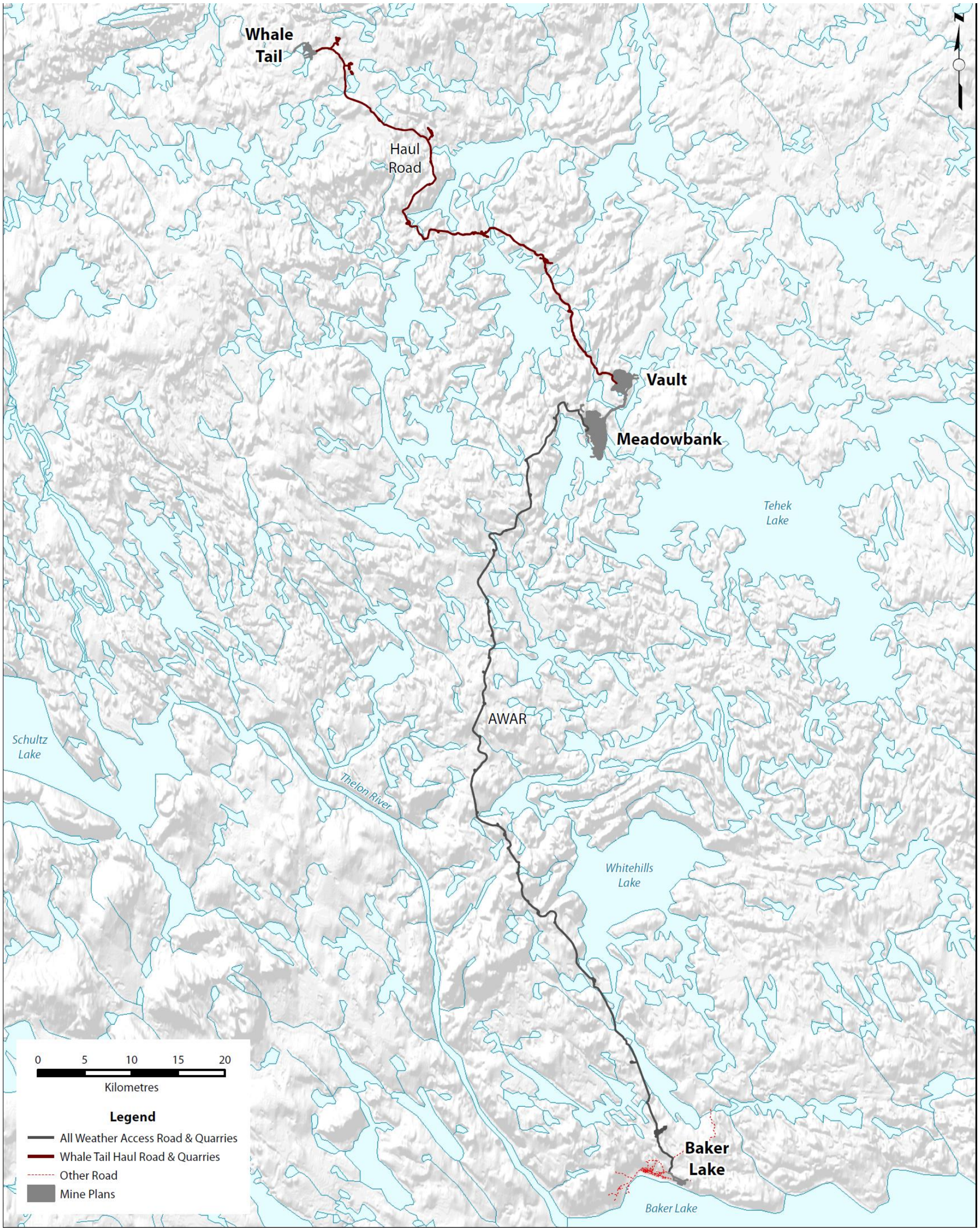


Figure 6. Baker Lake Marshalling Area Sampling Locations

2.2 2019 MINE PLAN / WORK PLAN

2.2.1 2019 Mine Plan Meadowbank Site

The “*2019 Mine Plan*” for the Meadowbank Gold Project, prepared for the Kivalliq Inuit Association as required by Production Lease KVPL08D280, is attached in Appendix 2. This report was submitted to the KIA on December 21st, 2018, and outlines the activities planned for the project throughout the 2019 year.

The Meadowbank gold mine began the operation phase of the project in February 2010, and thus, is entering its tenth year of operations. In addition to routine activities throughout the 2019 season, a number of secondary construction/modification projects will be undertaken near the main mine site area and Vault area. Tailings will be deposited in the South Cell and the North Cell of the TSF until the in-pit deposition project is approved. Additional construction might be required in 2019 in the South Cell and North Cell depending on the in-pit approval status.

Environmental monitoring (wildlife, aquatic effects, groundwater, noise and air) will continue through 2019 in support of all operational undertakings at the Meadowbank site as required by the NWB Type A Water License 2AM-MEA1526, NIRB Project Certificate No.004, DFO authorizations, and MDMER regulations.

In 2019, Agnico mining plan is to operate Portage and Vault pits at the Meadowbank mine site. A total of 2.6 Mt of rock will be hauled from these two pit areas during the year. The mine plan consists of moving 2.0 Mt of waste rock and 0.6 Mt of ore from the open pits, and 1.2 Mt of ore from the stockpiles. The ultimate phase of Portage Pit will be depleted by end of Q3 2019, Vault Pit will be depleted by Q1 2019 and BB Phaser will be depleted by Q2 2019.

The Waste Management Plan for 2019 is to maximize rock storage facility (RSF) utilization and minimize haulage cycle times which will, in turn, minimize the greenhouse gas emissions and impact on the environment.

2.2.2 2019 Work Plan Whale Tail Site

The “*2019 Work Plan*” for the Whale Tail Pit Project, prepared for the Kivalliq Inuit Association as required by Commercial Lease KVCL314C01, is attached in Appendix 3. This report was amended on July 5, 2018 and resubmitted to KIA. The amendment was to included the commercial lease increased area, the pre-development and construction activities and planned activities for the project throughout the 2018 - 2019 year.

The ‘*Whale Tail Haul Road 2019 Work Plan*’, prepared for the KIA as required by Lease KVRW15F01, is attached in Appendix 4. On October 2018, this 2019 work plan was submitted to KIA as part of the KVRW15F01 renewal process. This Work Plan detailed planned road maintenance and operation activities along the Whale Tail Haul Road throughout the 2019 year. Environmental monitoring (wildlife, dust suppression, waste management, air and water quality) will continue through 2019.

On December 21st, 2018 Agnico submitted to KIA the ‘2*019 Whale Tail Work Plan for Quarry/Esker Permits KVCA15Q01, KVCA15Q02, KVCA17Q01 and KVCA18Q01*’ (Appendix 5). This Work Plan detailed planned activities for the quarry/esker along the Whale Tail Haul Road throughout the 2019 year. As per the Work Plan, Agnico is currently planning to remove a relatively small amount of IOL esker and quarry material in 2019. Environmental monitoring (wildlife, water quality and archeology) will continue through 2019.

2.2.3 NIRB Screening Decision No. 11EN010

As requested by NIRB in the screening decision NIRB File No.11EN010, Agnico included within this annual report (Appendix 6), a comprehensive annual report of the activities associated with the project.

SECTION 3. CONSTRUCTION / EARTHWORKS

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

3.1 DIKES AND DAMS

3.1.1 Meadowbank Site

3.1.1.1 Performance Evaluation

As required by NWB Water License 2AM-MEA1526, Schedule B, Item 1:

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

The surveillance program for the dewatering dikes and the tailings storage facility structure include site observation, inspection and instrument monitoring activity. Details of these surveillance program and their frequency are presented in the surveillance section of the TSF Operation Maintenance and Surveillance (OMS) manual and in the Dewatering Dike OMS Manual in Appendix 51.

The main surveillance activity are:

- Site observation – conducted by personal working near or on the structure and occur as part of their daily activities;
- Routine visual inspection – conducted on a pre-defined schedule (usually monthly during normal operating condition) and target specific activity
- Dike safety inspection (annual geotechnical inspection) – Comprehensive technical inspection integrating inspections and results of monitoring instruments. Done by an external geotechnical engineer on a yearly basis
- Independent dam safety review –Review of all aspects of the design, construction, operation, maintenance, processes and other systems affecting the dams's safety, including the safety management system. Done annually by the Meadowbank Dike Review Board (MDRB).
- Instruments monitoring – Include the review of instrumentation data including thermistors, piezometers, inclinometer, blast monitoring, seepage flow monitoring, settlement monitoring. Instruments data are checked on a pre-determined frequency and reported on a pre-determined frequency based on the structure performance (vary from monthly to quarterly)

b. A comparison of measured versus predicted performance;

A detailed comparison and analysis of the measured versus predicted performance can be found in the 2018 Annual Geotechnical Inspection report presented in Appendix 7. This assessment is based on visual inspection and analysis of instrumentation monitoring.

Table 3.1 presents the updated Trigger Action Response Plan (TARP) level of each dike at Meadowbank which is an indicator of measured versus predicted performance. Green level mean that the performance of the structure is per normal operating condition while yellow mean that a performance has started to deviate from the normal operating condition. Surveillance will continue to assess the performance of the structures as per OMS practice and the surveillance data are used to evaluate the TARP level of each structure and the required action.

Table 3.1. Operating Condition of Dike at Meadowbank

Structure	Type	TARP Level	Comments
East Dike	Dewatering Dike	Green (normal operating condition)	Presence of seepage but still within normal operating condition
Bay-Goose Dike	Dewatering Dike	Green (normal operating condition)	Presence of seepage but still within normal operating condition
South Camp Dike	Dewatering Dike	Green (normal operating condition)	
Vault Dike	Dewatering Dike	Green (normal operating condition)	
Saddle Dam 1	Tailings Dike North Cell Periphery	Green (normal operating condition)	
Saddle Dam 2	Tailings Dike North Cell Periphery	Green (normal operating condition)	
RF1	Tailings Dike North Cell Periphery	Green (normal operating condition)	
RF2	Tailings Dike North Cell Periphery	Green (normal operating condition)	
North Cell Internal Structure	Tailings Dike North Cell Internal Structure	Green (normal operating condition)	
Stormwater Dike	Tailings Dike Internal Structure	Yellow (deviation from normal operating condition)	Due to tension cracks
Saddle Dam 3	Tailings Dike South Cell Periphery	Green (normal operating condition)	
Saddle Dam 4	Tailings Dike South Cell Periphery	Green (normal operating condition)	
Saddle Dam 5	Tailings Dike South Cell Periphery	Green (normal operating condition)	

Central Dike	Tailings Dike South Cell Periphery	Yellow (deviation from normal operating condition)	Due to high seepage rate through bedrock foundation

At Stormwater dike, the performance of the structure is deviating from normal operating condition due to the presence of tension cracks that started in 2016 and continued in 2017 and 2018. The appearance of cracks usually appear during freshet. These cracks are caused by a thawing of the frozen soft sediment foundation causing settlement. This is supported by observations that the area affected is different each year and is consistent with where the water is ponding against the structure. Further discussion on the risk and mitigation measured is included in Section C below.

At Central Dike, the performance of the structure is deviating from normal operating condition due to the presence of high amount of seepage through the bedrock foundation. This condition started in 2014 and is still ongoing on 2018, but to a lesser extent. Further discussion on the risk and mitigation measured is included in Section C below.

More details are available in the 2018 Annual Geotechnical Inspection available in Appendix 7 and in the 2018 Water Management Report and Plan (Appendix 8).

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

Central Dike

Seepage into the basin at the downstream toe of Central Dike was observed when tailings deposition was transferred from the North Cell of the TSF to the South Cell in 2014. The rate of seepage started to increase proportionally to the rise of the pond level of the South Cell and reached a peak of 946 m^3/hr in 2015. Desktop studies were undertaken by Golder in 2015 to estimate the seepage flows and pore water pressures, verify the dike stability, and attempt to predict the eventual flow volume that would report to the downstream toe for higher pond elevation. The seepage pathway used in the Golder 2015 model was through a layer of fine material in the till layer of the foundation as it was deemed the most critical scenario for the structure stability. The main recommendation from this desktop study was to maintain beaches adjacent to Central Dike and to maintain a ‘back pressure’ on the downstream side of Central Dike in order to reduce the hydraulic gradient by holding the downstream pond at El. 115 m.

Willowstick was also hired to carry out geophysical soundings (electromagnetic survey) to detect seepage paths. The geophysical campaign led to additional recommendations and identified possible seepage path locations. Following the geophysical investigation, an investigation was conducted by SNC Lavallin (SNC) and Agnico in December 2015 at station CD-595, and between CD-810 and CD-850. Highly altered and fractured bedrock was encountered and high hydraulic conductivity was measured from Packer testing. Instrumentation of the four boreholes with piezometers and thermistors was done at the same time. In 2016, the MDRB recommended that the seepage model and stability analyses be updated.

A study has been completed in 2017 to update the seepage modelling and stability assessment with a seepage flow through the bedrock. In the summer of 2017 an investigation and instrumentation campaign was performed by Golder to confirm the results of the seepage modelling. The results from this investigation support the hypothesis that the seepage pathway occur in the bedrock. During this investigation a potential void in the till layer was encountered during drilling. The MDRB recommended that GPR be used to investigate the void extent. Agnico looked at this possibility but it quickly became apparent that this technology was not suitable due to the high flow of water in the foundation. A complementary drilling investigation was performed instead and was not able to confirm the presence of the void. These results were communicated to the MDRB who agreed with the approach and conclusion.

The Central Dike seepage is normally pumped back into the South Cell. From September to October 2017 the seepage was transferred to Goose Pit as a mitigation measure. This measure, combined with an adapted tailings deposition plan was effective in reducing the seepage flow rate. As a results the average seepage rate at Central Dike decreased from 540 m^3/h in 2017 to 263 m^3/hr at the end of 2018 and is following the trend from the 2017 seepage modelling done by Golder.

In the summer of 2017 the water in the downstream pond became orange and this was associated with rapid temperature variation. This event was investigated by chemical analysis and was found to be caused by the precipitation of iron oxide from bacterial process. As predicted this event re-occurred in the summer of 2018.

The current mitigation strategy to reduce the risk related to seepage include the following :

- increased surveillance frequency (instrumentation review, site observation)
- presence of a backup pumping unit in the downstream area to maintain enough pumping capacity in case of a sudden seepage increase
- revised tailings & water management strategy to minimise the amount of water stored into the South Cell while maximising tailings coverage against Central Dike and Saddle Dam 4.

As recommended by CIRNAC in the review of the 2016 Meadowbank Annual Report, the recommendations from the Annual Geotechnical Inspection and the Meadowbank Dike Review Board (MDRB) Report along with the accompanying Agnico responses related to the Central Dike seepage are included directly in this section of annual report.

Recommendation from the 2018 Annual Geotechnical Inspection:

The following recommendation are made as a results of seepage from the South Cell ponding on the downstream side of Central Dike:

- ***Continue maintaining a tailing beach against Central Dike***
- ***Promote beach deposition to seal assumed fractured bedrock areas expected to control the seepage under Central Dike***
- ***Control the hydraulic gradient by proper management of South Cell water pond and dike downstream toe pond***
- ***Closely monitoring the water quality***
- ***Inspecting the structure for changing conditions***

All of these recommendations are practices currently done by Agnico to manage the Central Dike situation. These practices will continue to be done.

Recommendation and Agnico Action Plan from the Meadowbank Dikes Review Board Report #24;

Recent drone aerial survey has permitted the observation of linear settlement features in the tailings surface that merit study and explanation. From pre-construction data, a topographical model of the valley side may be developed and used to identify any features that could assist with the interpretation. Survey should continue as long as conditions permit and be resumed in the spring to collect additional information with respect to potential sinkholes.

Agnico has performed drone aerial surveys and they will resume once the ice melt from the surface of the TSF. This data will be used to monitor the evolution of the depression at the surface of the tailings. Agnico will assess the necessity of building a topographical model of the valley using pre-construction data in the summer of 2019 based on the evolution of the tailings depression and the status of the South Cell.

The Board concurs that the array of piezometers installed beneath the Central Dike provides valuable information. In case of defects and instrument failures, the Board recommends that the current level of instrumentation be maintained. That being said, any new instrumentation should be optimized with respect to location to facilitate the comprehension. Study of the instrument layout in relation to the geological model will be part of this optimization.

Agnico Meadowbank will evaluate the possibility of maintaining the current level of instrumentation at Central Dike should additional instruments present further defects based on data criticality.

A record of the instruments with defects at Central Dike is being kept up to date.

The Board notes that the spikes in the instrument readings are symptomatic of the dynamic condition of the foundation. Despite the reduction in seepage rates, vigilance is required in the observation and interpretation of the piezometric levels. There is an ongoing need to validate the Trigger Action Response Plan (TARP) as it relates to the data gathering. The frequency of data evaluation should be consistent with the ability to program alert and alarm levels to ensure timely response to change.

In 2016, Agnico put in place a Trigger Action Response Plan (TARP) of Central Dike that has aspects related to data gathering and frequency of data evaluation at Central Dike is covered in the OMS manual for the Meadowbank tailings dike. Agnico will ensure that these aspects are carefully reviewed and updated in the 2019 revision of the OMS manual, planned for Q1 2019.

As a general comment relating to monitoring, the Board recommends that a 'Best Practice Manual' be prepared for use on a corporate basis. This would include :

- **Establishment of instrumentation needs with respect to Quantifiable Performance Indicators ;**
- **Strategic location with respect to geology and geotechnics;**

- **Selection of most reliable instrument types;**
- **Calibration and initial reading validation;**
- **Installation procedures;**
- **Manual and automated reading;**
- **Data treatment, presentation and evaluation; and**
- **Information dissemination.**

Agnico Meadowbank acknowledges this recommendation and will discuss with corporate representatives to evaluate this possibility. However, in 2018, as a way to keep a corporate memory of learnings from Meadowbank, an engineer of record was implemented.

<u>Stormwater Dike</u>

At the end of August 2016, during a routine inspection, Agnico noticed tension cracks and signs of settlements on the crest of Stormwater Dike between Sta. 10+500 to 10+750 approximatively. The crack system that suddenly developed in this area had a lateral and vertical component according to the monitoring equipment. To mitigate against a possible foundation failure, a rockfill buttress support was constructed at the downstream toe of Stormwater Dike in the South Cell (from Sta. 10+300 to Sta. 10+700 approximatively). After the completion of this buttress the displacement at Stormwater Dike stabilized and then stopped. Cracks have since been filled with bentonite.

In July 2017, during a routine inspection, Agnico noticed new tension cracks and signs of settlements on the crest of Stormwater Dike around Sta. 10+425, between Sta. 10+550 and Sta. 10+650, between Sta. 10+800 and Sta. 10+950, and around Sta. 11+050 approximatively. Settling of about 300 mm was observed between Sta. 10+800 and Sta. 10+950, approximately. Cracks appear to be oblique tension fractures, extending over the entire width of the dike crest. Some cracks were up to 5 cm wide but most of them did not progress after they were first observed and were then filled with bentonite. The area affected by these cracks is consistent with the limits of the South Cell water ponding against Stormwater Dike, which probably thawed the frozen soft soil foundation.

In April 2018, new cracks were observed by Agnico in between Sta. 10+950 and Sta. 11+010. The widest crack was about 4 cm wide but the cracks did not progress significantly after they were first noted. New crack were observed later in July in between S114 and S115 but no elongation was noted after. The cracks have been filled with bentonite.

The current understanding of the situation is that the soft sediment foundation was frozen in the winter of 2010 while additional rockfill material continued to be placed over it until July 2010. The foundation freezing explains why no adverse settlement or soil failure was observed until the South Cell water level started reaching the toe of the structure in July 2016, which probably thawed the frozen soft soil foundation. The mechanism that caused the observed movement could be due to a foundation soil failure, the thawing of ice lenses or a combination of both.

It is the MDRB and Agnico's opinion that the mechanisms for cracks and settlement is well understood and is not enough to cause a dike instability. The mitigation plan for the Stormwater Dike situation is to increase the frequency of the surveillance activity especially during freshet period and if new cracks are observed. It is not judged necessary to implement measure to prevent settlement and cracks as long as a proper surveillance plan is implemented.

As Stormwater Dike (SWD) is an internal structure the risk for seepage of water out of the TSF is quite low. The potential for seepage through groundwater is monitored through groundwater well data taken around site.

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

No mitigation work was performed on any dikes in 2018.

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

No change in design or as-built condition was done on any dikes in 2018. Please refer to Section 3.1.5 for a summary of dike construction in 2018.

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

Section 4.0 of the 2018 Annual Geotechnical Inspection by Golder, provided in Appendix 7, presents the instrumentation data collected in 2018 .

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

No major remediation work structures was undertaken in 2018. The cracks that appeared at Stormwater Dike in 2018 have been filled with bentonite.

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

Table 3.2 present the monthly quantities of seepage from dikes. More information can be found in the 2018 version of the Water Management Plan (Appendix 8).

Table 3.2. Monthly volume of seepage (m^3) pumped at Meadowbank in 2018

Seepage	Central Dike	East Dike	East Dike	Bay Goose Dike[1]
Discharge	**South Cell**	**2 Portage Lake**	**Portage Pit**	**Goose Pit**
January	225,715	16,638	0	59
February	189,026	13,937	0	53
March	206,319	18,592	0	59
April	181,965	17,062	0	57
May	177,736	19,078	0	59
June	195,645	2,654	16,556	375
July	195,987	0	22,342	375
August	205,314	5,084	16,158	228

September	189,297	13,372	0	123
October	191,783	12,078	0	59
November	171,406	11,226	0	57
December	176,167	10,968	0	59
Total	**2,306,360**	**140,690**	**55,056**	**1,564**

[1]Intrapolated from instantaneous flow measurement

3.1.2 Whale Tail Site

3.1.2.1 Performance Evaluation

As required by NWB Water License 2AM-WTP1826 Part I, Item 16: ***The Licensee shall submit the results and interpretation of the Seepage monitoring required in Part I Item 15 in the Annual Report required under Part B, Item 2***

And

As required by Water License 2AM-WTP1826, Schedule B, Item 1*:*

Whale Tail Dike was in construction in 2018. Instrumentation will be installed in 2019 prior to the commissioning of the infrastructure. The other water management infrastructures at the Whale Tail Site will be constructed and commissioned in 2019.

The performance evaluation of the commissioned water management infrastructure at Whale Tail Site will be discussed in the 2019 annual report.

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

Not applicable for the 2018 Annual Report

b. A comparison of measured versus predicted performance;

Not applicable for the 2018 Annual Report

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

Not applicable for the 2018 Annual Report

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

Not applicable for 2018 the Annual Report

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

Not applicable for 2018 the Annual Report

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

Not applicable for 2018 the Annual Report

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

Not applicable for 2018 the Annual Report

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

Not applicable for 2018 the Annual Report

3.2 MEADOWBANK DIKE REVIEW BOARD

3.2.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Part I, Item 12: *The Licensee shall submit to the Board as part of the Annual Report required under Part B Item 2, all reports and performance evaluations prepared by the Independent Geotechnical Expert Review Panel.*

The annual meeting of the Meadowbank Dike Review Board (MDRB) was held in September 2018 (MDRB 24). The MDRB 24 report, along with Agnico's response to the recommendations are included in Appendix 9.

3.2.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Part I, Item 14: *The Licensee shall submit to the Board as part of the Annual Report required under Part B, Item 2, all reports and performance evaluations prepared by the Independent Geotechnical Expert Review Panel.*

During MDRB 24 the design and construction of the Whale Tail Project water management structure were discussed. These aspects are presented in a separate report. This report, along with Agnico's response to the recommendations are included in Appendix 10.

3.3 GEOTECHNICAL ENGINEER'S INSPECTION REPORT

3.3.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Part I, Item 11: *The Licensee shall submit to the Board as part of the Annual Report, the Geotechnical Engineer's Inspection Report. The Report shall include a cover letter from the Licensee outlining an implementation plan to address the recommendations of the Geotechnical Engineer.*

The Meadowbank 2018 annual geotechnical inspection was done by Golder in August-September 2018. The report, along with Agnico's response to the recommendations are included in Appendix 11. In order to keep the whole interpretation and understanding of the recommendations and responses, Agnico will refer the reader to the Appendix.

3.3.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Part I, Item 13: ***The Licensee shall submit to the Board as part of the Annual Report, the Geotechnical Engineer's Inspection Report. The Report shall include a cover letter from the Licensee outlining an implementation plan to address the recommendations of the Geotechnical Engineer.***

In 2018, construction was occurring at the Whale Tail Site and there was no commissioned infrastructure to inspect.

The Whale Tail Haul Road and infrastructure along the road was inspected and reported as part of the Meadowbank annual geotechnical inspection. The report, along with Agnico's response to the recommendations are included in Appendix 11.

3.4 QUARRIES

3.4.1 Meadowbank Site

3.4.1.1 Material usage

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

As required by CIRNAC Land Lease 66A/8 72-5, 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 CIRNAC Land Lease 66A/8 72-5, 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.***

In 2018, Agnico blasted 12,963 m^3 of NPAG material from Quarry 9 (Parcel E) along the Meadowbank All Weather Access Road situated on CIRNAC leased land. The 2018 Annual Quarry Report was sent to

CIRNAC on February 25, 2019. The material removed was used on the AWAR for maintenance. No material was blasted in other quarries situated on CIRNAC and KIA leased land.

Regular inspections of the quarries were also performed during the year to ensure that runoff, if any, would be free of any visible sheen and would not impact the environment. No issues with runoff water inside the quarries were noted in 2018.

3.4.1.2 Quarry 22

Quarry 22 was historically used as a temporary storage area for contaminated materials generated as a result of petroleum hydrocarbon (PHC) spill clean-up activities. The contaminated material from these quarries last excavated in 2016 (see Q22 2016 report – 2016 Annual report). The contaminated material was transported to the Meadowbank Landfarm. In 2017, the presence of falcon and safety concerns prevented the campaign from being completed.

Taking into consideration the results from the 2014 to 2016 work plan, Agnico Eagle intended to continue to scarify the surface of Quarry 22 in 2018, as in previous years, with the back-end of a grader, allowing ground surface to be aerated thus increasing degradation of PHC. However, because of repeated observation of Peregrine Falcon activity and nesting during quarry inspections, as it was the case in 2017, Agnico decided to limit all activity within the area, including scarification. This decision was taken to minimize impact on potential success of nesting for this species and therefore ensure proper conditions of nesting activity. A sampling campaign was however completed late September to track the degradation of PHC with time. The Quarry 22 report can be found in Appendix 12 –– Quarry 22 2018 Report.

On September 25th, 2018, the Environment department sampled the soil from the substrate to further assess PHC degradation following the clean-up action since 2013 and to track rates of contamination reclamation. Results from the 2018 sampling indicate some remnants of contamination when compared to the CCME remediation Criteria for Industrial use of Coarse material. According to the results, contamination remaining is associated with Fraction 3, as in the past.

When comparing results of 2018 with the sampling done in 2014 and 2016, levels of contamination appear to be trending down). No more results are above CCME criteria for fraction 1, 2 and 4. Higher level is noted within fraction 3 in section Q-22-1 compared with 2016 which was the area that contained the bulk of historical contaminated material placed in the quarry. Refer to Section 3 of the 2018 Quarry 22 Report (Appendix 12) for a complete review of the historical results and trending.

Based on the degradation history of PHC's in the Meadowbank Landfarm and upon analyzing results from the 2014, 2016 and 2018 Q22 soil sampling, Agnico Eagle is confident that the natural degradation of Petroleum Hydrocarbon related products is an effective remediation method for Q22.

In 2019, according to the peregrine falcon activity and nesting observation during the weekly quarry inspections, Agnico will evaluate if the work could be completed without disturbance to wildlife. If needed, the area could be limited to any activity in order to ensure adequate bird protection and management. If no repeated peregrine falcon presences are observed, Agnico proposes to continue scarifying the surface areas in Q22 during the summer of 2019. According to the last sampling campaign, the main focus should be on fraction 3 and efforts should be deployed especially in section Q22-1 and Q22-2 as they are the only two results above the CCME criteria. However, if a peregrine falcon family establish their nest in the quarry, Agnico will simply postpone the scarification in late September before the freeze up season in order to let the birds leave the nest without disturbance.

Another round of sampling is planned in late fall in 2019. Results will then be compared to the previous data (2014, 2016 and 2018) to monitor the level of degradation. Based on the soil sampling campaign, Agnico will analyze the next actions to be taken. If needed, further course of action could include removal of additional material. Nonetheless, Agnico considers the actual methodology to be a satisfactory solution to the remediation of the quarry.

3.4.2 Whale Tail Site

3.4.2.1 Material Usage

The annual reporting requirements listed in the following sections apply only to quarries located along the Whale Tail Haul Road.

As required by CIRNAC Land Lease 66H/8-1-4, Condition 9: ***The lessee shall file, annually, with the Minister in the manner and format stipulated, no later than sixty (60) days following the anniversary date of the effective date of this lease. 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 CIRNAC Land Lease 66H/8-1-4, Condition 27: ***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.***

In 2018, Agnico blasted/removed 121,966 m^3 of NPAG gravel from esker and 162,578 m^3 NPAG rock material from quarry along the Whale Tail Haul Road situated on CIRNAC leased land. The breakdown per esker/quarry are provided in Table 3.3 below. The 2018 Annual Quarry Report was sent to CIRNAC on February 25, 2019. The material removed was use for the Whale Tail Haul Construction.

Agnico also removed, in 2018, 184,763 m^3 of NPAG gravel material from esker along the Whale Tail Haul Road situated on KIA leased land. The breakdown per esker/quarry are provided in Table 3.3 below. The material removed was use for the Whale Tail Haul Construction and Whale Tail site construction. As required by permit KVCA15Q01, KVCA15Q02 and KVCA18Q01, a report was submitted to KIA prior to the tenth day of each month indicating the quantity of material removed from the Lands during the prior month along with the applicable fees.

During peak flow of freshet 2018, daily inspection of eskers and quarries along the Whale Tail Haut Road were performed to ensure that runoff, if any, would be free of any visible sheen and would not impact the environment. A freshet leader was hired in 2018 and was dedicated to the inspection of Whale Tail Haul Road including the esker, quarries, culvert and bridges. If needed, mitigation measures, as straw boom or turbidity barrier, were put in place as prevention measures. No issues with runoff water inside the eskers/quarries to any waterbodies were noted in 2018.

Table 3.3. Whale Tail Haul Road Material Removed 2018

Permit	Regulator	Quarry/Esker	CIRNAC PARCEL	Esker material removed (m^3)	Quarry material removed (m^3)
KVCA18Q01	KIA	Quarry 10.5	NA	80,120	NA
66H/8-01-1	CIRNAC	Esker 1	E	0	35,741
66H/8-01-1	CIRNAC	Esker 2 ABC	D	12,525	0
66H/8-01-1	CIRNAC	Esker 2D	C	0	0
66H/8-01-1	CIRNAC	Quarry 26.25	F	0	48,507
66H/8-01-1	CIRNAC	Quarry 30.05	G	0	54,748
66H/8-01-1	CIRNAC	Quarry 34.9	H	0	18,414
66H/8-01-1	CIRNAC	Esker 3	B	108,441	0
66H/8-01-1	CIRNAC	Quarry 50.6	I	0	5,168
66H/8-01-1	CIRNAC	Quarry 52	J	0	0
66H/8-01-1	CIRNAC	Esker 4	A	0	0
KVCA15Q02	KIA	Esker 5	NA	24,832	NA
KVCA15Q02	KIA	Eskers 6	NA	54,135	NA
KVCA15Q01	KIA	Eskers 7	NA	25,676	NA

3.4.2.2 Setback Distance

As required by NIRB Project Certificate 008, Condition 20: ***Unless otherwise authorized, the Proponent shall maintain an appropriate setback distance between project quarries and borrow pits from fish-bearing or permanent waterbodies as required to prevent acid rock drainage or metal leaching into such waterbodies. Throughout quarry development and operation, the Proponent shall, on an annual basis, provide information regarding quarry setback distances maintained and/or mitigation measures implemented by the Proponent in fulfillment of this term and condition in the Proponent's annual report to the NIRB.***

The setback distance chosen was 31 metres from any waterbody high water mark. All quarries along the Whale Tail Haul Road as well as those on the Whale Tail site (Quarry 1 and Whale Tail starter pit) were design and excavated respecting this 31 metre setback distance, as illustrated in Figure 7 below.

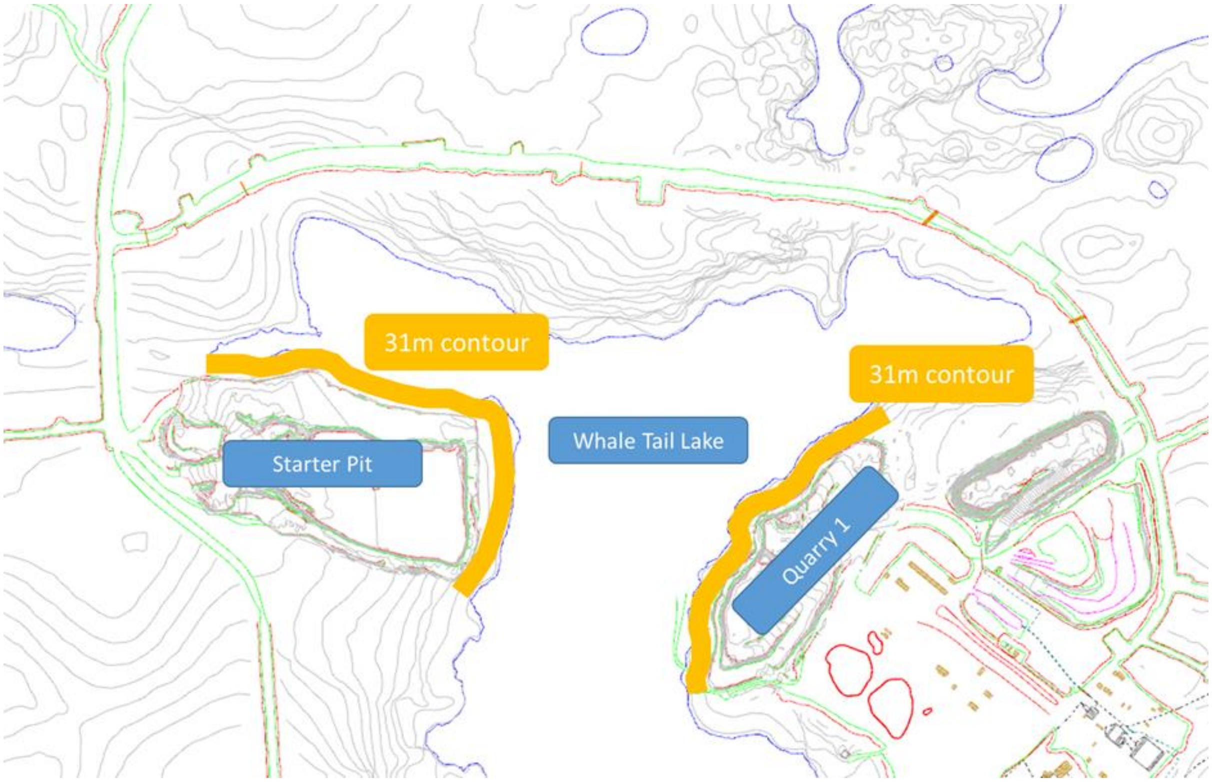


Figure 7. Whale Tail Starter Pit and Quarry 1 setback distance

3.5 2018 CONSTRUCTION

3.5.1 Meadowbank Site

The 2018 construction season at Meadowbank was conducted from April 23, 2018 to August 3, 2018. It consisted in the construction of Stage 6 for Central Dike (El. 145 m), the finalization of Stage 3 for Saddle Dam 3 (El. 145 m), and the construction of section of the North Cell Internal Structure (variable El.152-154 m). Construction was completed in accordance with the requirements of the Design and Technical Specifications developed by Golder for each structure.

The data collected from the quality assurance (QA) and quality control (QC) program during the construction of Stage 6 Central Dike, the finalization of Stage 3 of Saddle Dam 3 and the construction of the North Cell Internal Structure were used to confirm that the construction of each structure was completed in compliance with the Drawings and Technical Specifications. This includes earthwork construction such as foundation preparation and fill placement as well as the installation of the geosynthetics.

During the course of the work, four design changes and thirteen field adjustments were applied to take into account the existing site conditions and to optimize construction activities.

As-built reports of the construction completed in 2018 can be found in Appendix 13.

3.5.2 Whale Tail Site

In 2018, various construction activities were carried out at both the Whale Tail site and along the Whale Tail Haul Road. Along the Whale Tail Haul Road, additional material was deposited from various quarries to enlarge the road to the required width to support production activities. At the Whale Tail site, various service roads, haulage roads and pads were constructed. These included Roads 7 & 8 (access to Whale Tail WRSF), Road 9 (access to Whale Tail starter pit), Road 11 (access to Nemo Lake), Road 22 (access to emulsion storage facility) and Pad F extension (Water Treatment Plant), Pad H (main camp) and Pad P (truck scale pad).

In 2018, the construction activity of the water management infrastructure at Whale Tail Project included work on Whale Tail Dike (WTD) and on the Pad D Saline Protection ditches system. The construction of both structures will be completed in 2019 and an as-built report will be submitted 90 days after completion of construction as required by the Water License 2AM-WTP1826.

Whale Tail Dike is the structure to isolate the North portion of Whale Tail Lake for dewatering and provide access to the Whale Tail pit area. In 2018, construction of Whale Tail Dike was ongoing and construction activity included earthwork, dynamic compaction and secant pile construction. Construction of Whale Tail Dike will finish in 2019.

The objective of the Pad D saline protection ditches is to direct the contact saline water from the underground waste rock pad (Pad D) toward the underground mine attenuation pond (AP-5).The construction of the Pad D Saline Protection system at Whale Tail was partially carried in September 2018 and included excavation, placement of aggregate and geomembrane installation. The cover protection of the saline protection will be completed in 2019.

3.5.2.1 Design Report and Construction Drawings

As required by NWB Water License 2AM-WTP1826 Part D, Item 1: ***The Licensee shall submit to the Board for review, at least sixty (60) days prior to Construction, final design and Construction drawings accompanied, with a detailed report, for the following:***

a. Water works, including: Water Intake and causeway, Water control structures (dikes, berms, jetties, channels) and Water crossings (culverts, bridges);

b. Waste disposal facilities including: Wastewater Treatment Plant, Sewage Treatment Plant, Discharge Diffuser, Waste Rock Storage Facility, Overburden stockpiles, and Landfill; and

c. Whale Tail Bulk Fuel Storage Facility

And

As required by NWB Water License 2AM-WTP1826 Part D, Item 3: ***The Licensee shall submit to the Board for review, at least thirty (30) days prior to Construction, final design and Construction drawings accompanied, with a detailed report, for the Whale Tail Dike. The detailed report shall include items referred to in Part D Item 2.***

And

As required by DFO Authorization 16HCAA-00370 Condition 2.3.5: ***As per the NIRB Project Certificate No. 008 Condition 21, the Proponent shall ensure that all project infrastructure in watercourses is designed and constructed in such a manner that it does not unduly prevent or limit the movement of water or fish species in fish streams and rivers, unless otherwise authorized by Fisheries and Oceans Canada.***

And

As required by DFO Authorization 16HCAA-00370, Condition 2.4.1: ***The Proponent shall provide detailed engineering plans to DFO for review and approval, for construction works that have potential to impact fish and fish habitat, at least 3 months prior to commencement of the works. This includes dikes (e.g., Northeast dike), diversion/realignment channels, and freshwater jetty.***

As mentioned above in Section 3.5.2, 2018 was a important year in the construction of the Whale Tail Project. Table 3.4 below provided a list of Design Reports submitted to NWB for approval before the construction began. All of the Design Reports along with regulator's comment and Agnico's response can be found on the NWB FTP site (ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-WTP1826%20Agnico/3%20TECH/D%20CONSTRUCTION/).

To addresses DFO Authorization 16HCAA-00370 Condition 2.3.5 and 2.4.1, in 2018, culvert construction for roads 8, 9, 11 and 22 was designed and submitted to NWB (Table 3.4). Between July 13 – August 3, 2018, design documents were available for DFO review. No comments from DFO were received, and on September 4, NWB approved the Design Report for Culverts (roads 8, 9, 11 and 22). As-built reports for culvert construction, including photographs, will be provided to NWB 90 days after the construction completion, as required according to the Project's Type A Water License (2AM-WTP1826) Part D Item 15. DFO have the opportunity to comment all design reports submitted to the NWB for approval. Agnico will continue to constructed infrastructures in such a manner that it does not unduly prevent or limit the movement of water or fish species in fish streams and rivers.

Table 3.4. 2018 List of Design Report Submitted

Design Report	60-day notice Submission to NWB	NWB Design Report Approval
Whale Tail Dike	2018-05-31	2018-07-16
Construction Water Treatment Plan	2018-06-22	2018-07-20
Waste Rock Storage Facility - Starter pit	2018-06-29	2018-08-09
Culverts on Roads 8 ,9 ,11, 22	2018-07-13	2018-09-04
Fuel Storage Facility	2018-07-13	2019-09-07
Nemo Freshwater Intake	2018-07-19	2018-10-03
North East Dike	2018-07-27	2018-09-12
WRSF Dike	2018-08-24	2018-10-04
Mammoth Dike	2018-10-23	2019-12-05

WRSF, NPAG and Overburden pad	2018-11-22	2018-12-20
Whale Tail North Dewatering	2018-11-28	2018-12-20
Arsenic Water Treatment Plan	2018-1129	2019-01-14
Sewage Treatment Plant	2018-12-21	2018-01-24

3.5.2.2 Construction Summary Report

As required by NWB Water License 2AM-WTP1826 Part D, Item 15: ***The Licensee shall submit to the Board for review, within ninety (90) days of completion of each facility designed to contain, withhold, divert or retain Waters or Wastes during the construction phase, a Construction Summary Report prepared by a qualified Engineer(s) in accordance with Schedule D, Item 1.***

And

As required by NWB Water License 2AM-WTP1826 Part D, Item 16: ***The Licensee shall submit to the Board for review, within ninety (90) days of completion of the Whale Tail Haul Road, a Construction Summary Report prepared by a qualified Engineer(s) in accordance with Schedule D, Item 1.***

And

As required by KIA KVRW15F01 Item 54: ***AEM shall provide to KIA a detailed 'As Built Drawings' of all aspects of the Road within six (6) months after the date of final completion of the Construction, as determined in the certificates of final completion of such Construction work issued by the supervising engineer or other professional in charge of the Construction work.***

No Construction Summary Reports were sent to NWB in 2018.

3.5.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6e: ***A summary of modification and/or major maintenance work carried out on the Water Supply Facilities, Bulk Fuel Storage and Containment Facilities, and Wastewater Treatment Facility, including all associated structures, and an outline of any work anticipated for the next year.***

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 19*: The Licensee shall include in the Annual Report required under Part B, Item 2 and in Construction Summary Report required under Part E, Item 8 all data, monitoring results and information required by this Part.*

In 2015, the exploration group was relocated to the Amaruq satellite deposit at Meadowbank to a separate camp with a 125 person capacity. As of December 2018, the camp's capacity had been increased to hold up to 300 people. The Bionest wastewater treatment plan (STP) was replaced by a

Newterra system (which will become the wastewater treatment plan for the permanent camp) in April 2018 in order to accommodate more people. There was no other modification to the STP in 2018.

On October 28, 2018, the water source was changed from the Whale Tail Lake, approval source during the exploration phase as per Water License 2BB-MEA1828, to Nemo Lake, water source approved as per Water License 2AM-WTP1826. In order to accommodate more people to the exploration camp during the construction phase, a more performant water treatment plan (which will become the water treatment plan for the permanent camp) has replaced the one currently use during the exploration camp. There was no other modification bring to the WTP in 2018.

The exploration camp is planned to be closed and dismantled in Q3 2019.

The bulk fuel storage authorized by the Water License 2BB-MEA1828 was never constructed so there is no maintenance or modification to report for 2018.

No construction summary reported were provided in 2018.

SECTION 4. WATER MANAGEMENT ACTIVITIES

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

4.1 FRESH WATER USAGE

4.1.1 Meadowbank Site

As per Type A Water License 2AM-MEA1526 Part E Item 4: "*The total volume of fresh water for all uses and from all sources, shall not exceed 2,350,000 m^3 per year from the Licence approval data to December 21, 2017 followed by 9,120,000 m^3 per year in 2018 through to the expiry of the Licence.*"

Section 4.1.1.1 to 4.1.1.3 and Table 4.1 below detailed the freshwater consumption per sources. The total volume of freshwater pumped from the surrounding lakes and used for the Meadowbank Gold Project in 2018 was 1,027,159 m^3.

The volume of reclaim water used in the mill in 2018 was 2,228,748 m^3. The volume of freshwater that is contained in the ore to the mill in 2018 was 39,538 m^3.

Table 4.1. 2018 Meadowbank Freshwater Usage

Water Location	Source Lake	Jan	Feb	March	April	May	June
Camp	Third Portage Lake	3,237	3,058	3,404	3,320	3,527	3,304
Mill (freshwater tank)	Third Portage Lake	51,594	165,733	92,668	152,367	136,952	49,471
Emulsion plant	Unnamed Lake	93	68	88	91	94	47
Total Freshwater Usage (m^3)		**54,924**	**168,859**	**96,161**	**155,778**	**140,573**	**52,822**
Ore Water (m^3)	Ore	2,606	2,047	2,078	1,500	2,854	3,177
Reclaim Water Usage (m^3)	Tailings Pond	219,263	122,845	156,278	89,402	149,282	229,403

Water Location	Source Lake	July	Aug	Sept	Oct	Nov	Dec	Total
Camp	Third Portage Lake	3,330	3,270	3,265	3,319	3,409	3,501	39,944
Mill (freshwater tank)	Third Portage Lake	47,009	43,408	49,672	30,397	93,314	73,715	986,300
Emulsion plant	Unnamed Lake	68	66	60	87	76	77	915
Total Freshwater Usage (m^3)		**50,407**	**46,744**	**52,997**	**33,803**	**96,799**	**77,293**	**1,027,159**
Ore Water (m^3)	Ore	2,895	3,315	2,430	3,002	5,494	8,140	**39,538**
Reclaim Water Usage (m^3)	Tailings Pond	284,365	289,366	198,531	223,479	129,131	137,403	**2,228,748**

4.1.1.1 Third Portage Lake

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 2: ***Monthly and annual volume of fresh Water obtained from Third Portage Lake.***

A total volume of 1,026,244 m^3 of freshwater was used from Third Portage Lake for the project in 2018, which was in compliance with the Water License Freshwater maximum usage volume of 4,935,000 m^3 (Water License 2AM-MEA1526 Part E, Item1). The monthly breakdown usage is provided in Table 4.1 above.

4.1.1.2 Wally Lake

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 3: *Monthly and annual volume of fresh Water obtained from Wally Lake*.

As per Type A Water License 2AM-MEA1526 Part E Item 2, Agnico was authorized to withdrawn from Wally Lake a total of 4,185,000 m^3 per year starting in 2018.

There was no freshwater obtained from Wally Lake for re-flooding activities in 2018.

4.1.1.3 Unnamed Lake

Water used from unnamed lake was for the explosive mixing. In 2018, the total of freshwater obtained from unnamed lake in 2018 was 915 m^3. This was compliant with the Water License 2AM-MEA1526 Part E Item 2 which allow for a maximum usage of 2,400 m^3. The monthly breakdown usage is provided in Table 4.1 above

4.1.2 Whale Tail Site

Section 4.1.2.1 to 4.1.2.3 and Table 4.2 below detailed the freshwater consumption per sources. The total volume of freshwater pumped from the surrounding lakes and used for the Whale Tail Project in 2018, under Water License 2AM-WTP1826, was 13,612 m^3.

4.1.2.1 Nemo Lake

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 2: *Monthly and annual volume of fresh Water obtained from Nemo Lake.*

Agnico Eagle is authorized as per Part E Item 1 of the Water License 2AM-WTP1826 to intake water from Nemo Lake for a total year to date during construction of 220,750 m^3. From this amount, 175,000 m^3 are for the construction phase and 45,750 m^3 for the dust suppression.

The Nemo Lake freshwater intake pumping station was commissioned at the end of October 2018. There was no pumped water from Nemo Lake before October 28, 2018.

Starting on October 28, the Exploration Camp, construction and operation freshwater source become Nemo Lake, which is the approved freshwater source as per Water License 2AM-WTP1826. Total year to date water usage was 3,136 m^3. Table 4.2 below details the freshwater consumption per sources.

4.1.2.2 Whale Tail Lake

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 3: *Monthly and annual volume of fresh Water obtained from Whale Tail Lake.*

Following approval of the NWB, Agnico has been allowed under Part E item 3 of the Water License 2AM-WTP1826 and as per the NWB reason for decision letter to '*obtain water for domestic camp use during construction in 2018 from Whale Tail Lake with a total volume not exceeding 63,150 cubic metres per year from the date on which the Minister approves the issuance of the Licence through to the end 2018*'. A total of 9,285 m^3 was taken in Whale Tail Lake in 2018. The water usage per month is provided in Table 4.2.

4.1.2.3 Unnamed Lake

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 4: *Monthly and annual volume of fresh Water obtained from unnamed water bodies for Whale Tail Haul Road dust suppressant and for the Emulsion plant.*

Following approval of the Water License 2AM-WTP1826, the Water Licence 8BC-AEA1525 (Amaruq Exploration Access Road Project) was cancelled on November 9, 2018. The Licence 8BC originally authorized the use of water for dust suppression along the Whale Tail Haul Road to 299 m^3/day (109,135 m^3/year). A total of 1,191 m^3 were used in 2018. The water usage is per month is provided in Table 4.2.

Agnico Eagle is authorized as per Part E Item 4 of the Water License 2AM-WTP1826 to intake water from unnamed lake, for explosive mixing and associated use, for a total per of 2,500 m^3/year. In 2018, no water was withdrawn at Whale Tail Site for explosive mixing purpose.

Table 4.2. 2018 Whale Tail Freshwater Usage – License 2AM-WTP1826

Water Location	Source Lake	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Camp	Nemo Lake	0	0	0	0	0	0	0	0	0	175	1,269	1,185	2,629
Construction	Nemo Lake	0	0	0	0	0	0	0	0	0	83	183	241	507
Dust suppression	Nemo Lake	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Freshwater Usage (m^3)	Nemo Lake	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**258**	**1,452**	**1,426**	**3,136**
Construction	Whale Tail Lake	0	0	0	0	0	0	247	0	672	2,960	4,730	677	9,285
Dust suppression	Pond along Whale Tail Haul Road	0	0	0	0	0	0	950	190	51	0	0	0	1,191
Total Freshwater Usage (m^3)	All sources	**0**	**0**	**0**	**0**	**0**	**0**	**1,197**	**190**	**723**	**3,218**	**6,182**	**2,103**	**13,612**

Table 4.3. 2018 Whale Tail Freshwater Usage – License 2BB-MEA1828

Water Location	Source Lake	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Camp	Whale Tail Lake	624	536	715	779	833	1,026	964	958	1,231	1,160	0	0	8,825
Construction	Whale Tail Lake	112	247	394	235	214	702	1,075	505	552	571	0	0	4,606
Dust Suppression	Whale Tail Lake	0	0	0	0	0	68	684	0	0	0	0	0	752
Drill	Pond at Proximity drilling site	2,883	3,406	1,970	2,382	6,295	5,440	4,954	3,094	1,926	4,123	3,309	1,160	40,941
Total Freshwater Usage (m^3)	Nemo Lake	**3,619**	**4,189**	**3,079**	**3,396**	**7,341**	**7,236**	**7,676**	**4,557**	**3,709**	**5,854**	**3,309**	**1,160**	**55,124**

4.1.3 Exploration Whale Tail Site

4.1.3.1 Exploration Activities

As required by NWB Water License 2BB-MEA1828 Part B, Item 6a: ***The daily, monthly and annual quantities in cubic metres of all freshwater obtained for all purposes.***

Agnico Eagle is authorized as per Part C Item 1 of the Water License 2BB-MEA1828 to intake water from Whale Tail Lake for a volume of 299 m^3/day. Total year to date water usage was 55,124 m^3. On October 28, all water to supply the camp was taken from Nemo Lake – refer to Section 4.1.2.1. Table 4.3 above detailed the freshwater consumption.

4.1.3.2 Underground Activities

As required by NWB Water License 2BB-MEA1828 Part B, Item 6b: ***The daily, monthly and annual quantities in cubic metres of water pumped from the underground.***

In 2018, a total volume of 140 m^3 was discharge from the underground to the AP5 Pond.

4.1.3.3 Artesian Flow

As required by NWB Water License 2BB-MEA1828 Part B, Item 6j: ***Report all artesian flow occurrences as required under Part F, Item 7.***

No artesian flow occurrences encountered in 2018.

4.1.3.4 Location Water Sources

As required by NWB Water License 2BB-MEA1828 Part J, Item 6: ***The Licensee shall provide the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where sources of water are utilized for all purposes.***

Table 4.4 below provide the location of all sources of water used in 2018 for drilling purpose.

Table 4.4. 2018 Whale Tail Exploration Drilling Water Sources Location

Usage	Longitude	Latitude
Drilling	96° 47' 7.963" W	65° 23' 4.484" N
Drilling	96° 49' 32.592" W	65° 23' 29.261" N
Drilling	96° 46' 31.669" W	65° 24' 43.059" N
Drilling	96° 46' 43.477" W	65° 24' 5.591" N
Drilling	96° 43' 24.128" W	65° 24' 0.834" N
Drilling	96° 41' 47.113" W	65° 24' 13.090" N
Drilling	96° 41' 40.565" W	65° 24' 50.122" N
Drilling	96° 45' 24.928" W	65° 23' 35.022" N
Drilling	96° 48' 38.757" W	65° 22' 22.215" N
Drilling	96° 41' 19.778" W	65° 25' 5.019" N
Drilling	96° 49' 0.459" W	65° 22' 17.083" N
Drilling	96° 40' 20.147" W	65° 24' 23.066" N
Drilling	96° 48' 38.060" W	65° 22' 18.977" N
Drilling	96° 42' 13.303" W	65° 24' 41.706" N
Drilling	96° 48' 40.558" W	65° 22' 18.005" N
Drilling	96° 23' 45.917" W	65° 18' 15.661" N
Drilling	96° 20' 24.127" W	65° 18' 10.676" N
Drilling	96° 21' 19.711" W	65° 17' 30.691" N
Drilling	96° 23' 28.741" W	65° 15' 23.797" N
Drilling	96° 10' 6.569" W	65° 9' 42.250" N
Drilling	96° 10' 9.251" W	65° 2' 37.630" N
Drilling	96° 22' 14.909" W	64° 36' 26.510" N
Drilling	96° 22' 46.941" W	64° 35' 59.197" N
Drilling	96° 26' 20.601" W	64° 35' 45.750" N
Drilling	96° 31' 6.785" W	64° 35' 31.351" N
Drilling	96° 34' 1.172" W	64° 34' 29.656" N
Drilling	96° 33' 39.619" W	64° 34' 3.762" N

4.2 LAKE LEVEL MONITORING

4.2.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 4: *Results of lake level monitoring conducted under the protocol developed as per Part D Item 5 (Water Quality Monitoring and Management Plan for Dike Construction and Dewatering)*.

As of November 19, 2014 when tailings deposition began in the South Cell, the Portage Attenuation Pond ceased operation and became the South Cell TSF. There is no discharge from the Portage Attenuation Pond into Third Portage Lake since July 5, 2014. The elevation, in metres above sea level (masl), of Third Portage Lake continued to be monitored in 2018. Surveying activities were conducted on a weekly basis, during open water season and, weather permitting. The location of the lake level survey monitoring is identified as TPL-survey on Figure 1. The lake level monitoring results are presented in Table 4.5 the lake level remained within the range of naturally occurring levels.

Water from the East Dike Seepage was discharged into Second Portage Lake all year. The elevation, in metres above sea level, of Second Portage Lake was monitored on a weekly basis, during open water season and, weather permitting. The location of the lake level survey monitoring is identified as SPL-survey on Figure 1. The lake level monitoring results are presented in Table 4.5; the lake level remained within the range of naturally occurring levels.

No water was discharged from the Vault Attenuation Pond (contact water) in 2018. Water levels of the Vault Attenuation Pond were also monitored for informational purposes only. Table 4.5 presents the elevation monitoring results; the monitoring location is identified as VL-IN, Pond A, Pond C and Pond D on Figure 3.

When discharge occurred, water from Vault attenuation Pond is discharged into Wally Lake through the diffuser as effluent. The elevation measurement, in metres above sea level, of Wally Lake was conducted on a weekly basis, during open water season and, weather permitting. The location of the lake level survey monitoring station is identified as WL-survey on Figure 3. The lake level monitoring results are presented in Table 4.5; the lake level remained within the range of naturally occurring levels.

Following recommendation from CIRNAC regarding the 2018 Annual Report, starting 2019, Turn Lake water level monitoring in the next open water season will be completed, reported and compared to predictions.

NIRB recommendation regarding the 2014 Annual Report states: "*AEM should present the range of naturally occurring water levels for each season in the annual report to validate its claim that variations in water level within the receiving environment have not been impacted by discharge volume. This is especially important given the planned dewatering of the Phaser Pit in 2016*". "*AEM states these measurements were within the range of naturally occurring levels but does not present supporting data to inform this claim*."

In 2018, Agnico has the same conclusion as presented in report from 2015 to 2017; lake level for Third Portage, Second Portage and Wally lakes remained within the range of naturally occurring levels. Refer to PEAMP Section 12.1.2.1 and Table 12.3 for a complete discussion of the impacts of discharge on water level in the receiving environment. Overall, modeling predicted the natural range of water levels in

Third Portage Lake to be 133.82 – 134.19 masl. (2018 measured value range from 133.55 – 133.86 masl.), and the impact assessment indicated that this range would not be exceeded (Physical Environment Impact Assessment Report, 2005). Although these values accounted for 1-in-100 year precipitation or drought events, prior to operation, water levels were already below this range when monitoring began (prior to any significant freshwater consumption) in 2009 and continue to be as of now. Although rates of dewatering (i.e. pumping rates) were underestimated during the FEIS, water levels have not significantly changed at monitoring stations since monitoring began. The average water level for TPL in 2018 is 133.67 masl which is between the natural variation of the lake.

In 2018, there is no discharge from the Vault Attenuation Pond to Wally Lake. 2018 Water level monitoring range from 139.25 – 139.66 masl. With an average of 139.41 masl.. Impacts to water levels in Wally Lake have not been observed.

For Second Portage Lake, the baseline level is 133.1 masl. The average for 2018 is 132.96 masl (values range from 132.86 – 133.10) which is considered as a minor impact on lake level.

Following this analysis, Agnico concluded the water level in Third Portage, Second Portage and Wally Lakes were still remain within the range of naturally occurring levels. Agnico will continue to monitor water level and will see if the minor impact on SPL reoccurred in 2019. Natural seasonal variation comparison is not completed, as water elevation surveys are only taken during open water periods

Table 4.5. 2013-2018 Meadowbank Lake Water Level Monitoring Average

Date	Wally Lake (masl)	Second Portage Lake (masl)	Third Portage Lake (masl)	Vault Attenuation Pond A (masl)	Vault Attenuation Pond B (masl)	Vault Attenuation Pond C (masl)	Vault Attenuation Pond D (masl)
Code Identification	**WL-Survey**	**SPL-Survey**	**TPL-Survey**	**Pond A**	**VL-IN**	**Pond C**	**Pond D**
2013	139.38		133.57	136.79	137.35	134.59	136.05
2014	139.42	133.26	133.53	132.59	134.07	134.27	135.81
2015	139.47	133.12	133.65	134.66	134.97	134.97	135.18
2016	139.47	132.95	133.64	NA	134.85	134.25	132.85
2017	139.52	132.92	133.58	NA	134.86	134.27	132.31
2018	139.41	132.96	133.67	129.90	134.99	135.39	133.57

4.2.2 Whale Tail Site

As required by NWB Water License 2AM-WTP18266 Schedule B, Item 5: *Results of lake level monitoring conducted under the protocol developed as per Part D Item 5 for Whale Tail Lake (South Basin).*

The elevation, in metres above sea level, of Whale Tail Lake South Basin (range from 152.60 – 152.81), Whale Tail Lake North Basin (range from 152.53 – 153.04) and Mammoth Lake (range from 152.33 – 152.88) were monitored on a weekly basis, during open water season and, weather permitting. The location of the lake level survey monitoring is identified as WTS-Survey, WTN-Survey and MAM-Survey, respectively, on Figure 4. The lake level average results are presented in Table 4.6. As dike constructing was ongoing in 2018, Mammoth and WRSF Dike were not constructed, dewatering of Whale Tail North basin didn't start and there were no discharge to any receiving environment, water level assessment and comparison to FEIS will be completed only in 2019.

Table 4.1. 2018 Whale Tail Lake Water Level Average

Date	Whale Tail Lake South Basin (masl)	Whale Tail Lake North Basin (masl)	Mammoth Lake (masl)
Code Identification	**WTS-Survey**	**WTN-Survey**	**MAM-Survey**
2018	152.71	152.73	152.53

4.3 BATHYMETRIC SURVEYS BAKER LAKE MARSHALLING FACILITY

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 6: *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 July 20, 2018 and is included in Appendix 14. The survey was done before the shipping season.

4.4 WATER MANAGEMENT PLAN

4.4.1 Water Management Structure Inspection

4.4.1.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Part E, Item 10: *The Licensee shall carry out weekly inspections of all water management structures during periods of flow and the records be kept for review upon request of an Inspector. More frequent inspections may be required at the request of an Inspector. This information is to be included in the annual Water Management Plan.*

Agnico has an inspection program in place to inspect the water management infrastructures. Site observations on the dewatering dikes and tailings facility are performed every week and are documented if changing conditions are observed. Detailed visual inspections are performed and documented on a monthly basis. This inspection program has been reviewed and approved by the structure designer and the Meadowbank Dike Review Board.

More information is presented in the water management plan and in the dewatering dike and tailings facility OMS manuals (Appendix 51).

Agnico also conducted weekly inspections for seepage sump and contact and non-contact water ditches on a weekly basis and document the inspection. During freshet period, inspection frequency is increased as detailed in the Freshet Action Plan (Appendix D of the 2018 Water Management Report and Plan (Appendix 51 of the 2018 annual report)).

4.4.1.2 Whale Tail site

As required by NWB Water License 2AM-WTP1826 Part E, Item 11: *The Licensee shall carry out weekly inspections of all water management structures during periods of flow and the records of inspections shall be*

kept for review upon request of an Inspector. More frequent inspections may be required at the request of an Inspector. This information is to be included in the annual updated Water Management Plan.

No water management structures were operational in 2018 but inspections took place during the construction of those structures. Formal inspections will begin in 2019 once the structures are commissioned.

Agnico have elaborated a Whale Tail Freshet Action Plan and Incident Response Plan, similar to the one at Meadowbank, in advance of the 2019 Freshet. This plan is provide in Appendix 51 and will be updated annually to identified other area of concern around the Whale Tail site and roads.

4.4.2 Water Balance Water Quality Model Reporting Summary

4.4.2.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 5: ***Summary of reporting results for the Water Balance Water Quality model and any calibrations as required in Part E Items 7-9.***

And

As required by NWB Water License 2AM-MEA1526 Part E, Item 8: ***The Licensee shall submit a Water Quality Model for pit re-flooding as part of the Water Management Plan which shall be re-calibrated as necessary and updated at a minimum of once every two (2) years following commencement of Operations. The results and implications of the predictive model shall be reported to the Board.***

A water balance and water management report and plan update for 2018 was completed. The technical report 2018 Water Management Report and Plan is included in Appendix 8.

The 2018 water management plan for the Meadowbank mine site update consisted of:

- The validation and update of the site hydrology, including the revision of drainage areas and the update of meteorological conditions when required.
- The update of the water management plan, taking into account changes to the following elements:
    - Mining schedule;
    - Mill operation rate;
    - Mine pits layout;
    - Rock storage strategy; and
    - Tailings management strategy.
- The development of a water balance model for the entire site and for the complete duration of the mining activities until final site closure.

- A comparison of the predicted and recently remodeled pit water quality (Meadowbank Water Quality Forecasting Update – Based on the 2018 Water Management Plan, SNC,2019) forecast to assist in water treatment options development for closure planning.

The life-of-mine (LOM) considered for the water balance reflects the mining plan summarized in the 2018 Water Management Plan, as it pertains to the activities within the current approved license for the Meadowbank mine.

In 2018, in addition to the changes in the LOM, revisions/modifications were made to the Water Balance for optimization purposes including:

- Fresh water consumption revision;
- Total daily mill water consumption update;
- Update of the tailings deposition plan;
- Flooding sequence and volumes update to take into account the updated pit inflows;
- Seepage flow update;
- Water transfer flow update based on new water management plan;
- Tailings dry density and ice entrapment update based on latest bathymetric analysis.

Revisions and modifications to the Water Balance are discussed in detail in the 2018 Water Management Report and Plan (Appendix 8).

Below is summarized the water management highlights as presented in the 2018 Water Management Report and Plan:

- Freshwater pumped from Third Portage Lake was mainly used at the mill (average of 82,344 m^3/month in 2018) and the camp (average of 3,329 m^3/month in 2018);

- The last bathymetry analysis demonstrated that 25% to 65% of water is entrapped and the other portion (35% to 75%) is collected in the pond and reclaimed by the Mill. In 2018, a total of 2,191,390 m^3 was reused by the Mill. The fresh water utilization (Mill and Camp) will vary from 9.7 Mm^3 to 1.2 Mm^3 per year for 2019 to 2021, and will then decrease to 34,675 m^3 in 2022 once mill operation stops. This does not include pit flooding.

- Active pit flooding is planned to commence in 2020 with Portage and Vault Pits until 2026. Natural flooding of Goose Pit started in 2015, and will continue with active flooding in 2026. Active flooding of Vault Pit will commence in 2020 and will continue until 2026, From 2026 to 2030, the natural inflow will allow the pits to reach their final water elevation. Phaser and BBPhaser pits will be flooded exclusively by natural inflow. Contingent that the water quality meets CCME Guidelines for the Protection of Aquatic Life or site specific concentrations, dike breaching will occur in approximately 2030 and will reconnect the Portage and Goose areas to Third Portage Lake and Vault area to Wally Lake.

- The Water Quality Forecast 2018 (SNC, 2019) provides water quality modelling with updated parameters (including dissolved) to determine the need for potential treatment at closure. The updated water quality forecast model applies to the North and South Cell TSF Reclaim Ponds, the Portage, Goose, Vault and Phaser Pits. A review of the available water quality data measured in 2018 was undertaken. Treatment may be required for aluminium, arsenic, cadmium, chromium, copper, iron, mercury, nickel, lead, selenium, fluoride, total ammonia, as the pit water quality may exceed CCME limits if the water is not treated, based on the completely mixed assumption. For the Vault pit, no treatment is expected when re-flooding the pit, with CCME used as a reference base only.

The following recommendations are presented in the 2018 Water Management Report and Plan in order to improve on the current water management strategies and water balance:

- Continue to monitor and include any new flow monitoring locations/devices for any additional or new inflows observed in 2018.
- Continue to update the deposition plans of the North and South Cell as needed to maximize water use and availability as well as increasing the accuracy of the models including but not limited to bathymetric readings.
- Validate new tailings parameters with 2019 North and South Cells bathymetries.
- Conduct the water quality modelling analysis on a yearly basis based on updated water quality results and water balance through the life of mine.
- Continue development of the sediment flux model to evaluate erosion of geotechnical structures on site for the closure, primarily for TSS control: diversion ditches, rock storage facilities, capping of the tailings storage facilities, dikes and dams.
- Evaluate opportunities to reduce contaminants concentration in the reclaim pond prior to closure.
- Continue follow up of the Central Dike seepage flow and adjust pumping station capacity in function of the decreasing flow.
- Implement 2018 Meadowbank Water Quality Forecasting (SNC, 2019) recommendations.

4.4.2.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 6: *Summary of reporting results for the Water Balance and Water Quality model and any calibrations as required in Part E Items 7-9.*

And

As required by NWB Water License 2AM-WTP1826 Part E, Item 7: *The Licensee shall submit an updated Water Management Plan on an annual basis to the Board for review following the commencement of Operations. The Plan must include an updated Water Balance. The Water Management Plan shall include an action plan to be implemented if predicted re-flooded pit water quality indicates that treatment is necessary.*

And

As required by NWB Water License 2AM-WTP1826 Part E, Item 8: ***The Licensee shall submit a Water Quality Model for pit re-flooding and for WRSF contact water mixing into Mammoth Lake post-Closure as part of the Water Management Plan which shall be re-calibrated as necessary and updated annually following commencement of Operations. The results and implications of the predictive model shall be reported to the Board.***

The Water Management Plan Version 2 (October 2018) (Appendix 51) was approved by NWB on January 21, 2019. The water balance and water quality model will be updated in 2019 once the operation activities will have started and results will be reported in the 2019 Annual Report.

Table 4.7 present the water movement at Whale Tail Site in 2018.

Table 4.7. Water Movement at Whale Tail Project in 2018

	Monthly volume (m^3)		
Source	**Whale Tail Lake infiltration**	**Quarry 1**	**Whale Tail Lake**
Discharge location	**Quarry 1**	**AP5**	**Whale Tail Lake**
January-18	0	0	0
February-18	0	0	0
March-18	0	0	0
April-18	0	0	0
May-18	0	0	0
June-18	0	0	0
July-18	7,293	7,293	0
August-18	59,528	59,528	39,680
September-18	62,673	62,673	281,857
October-18	83,086	83,086	0
November-18	20,290	0	0
December-18	0	0	0
Total	**232,870**	**212,580**	**321,537**

4.4.3 Predicted Vs Measured Water Quality

4.4.3.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Part E, Item 9: ***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. The comparison of predicted water quality in reflooded pits also addresses Water License 2AM-MEA1526 Part E, Item 7.***

As per NIRB Comments to 2014 Annual Report "(…) provides comparisons between originally predicted and measured water quantity and quality in 2014. This comparison only uses the current year, but a year over year comparison would help identify trends." In the 2015 and 2016 Annual Report, the predicted water quantity and quality within the pits was compared to the measured water quantity and quality. This comparison used a year over year comparison. For the 2017 and 2018 Annual Reports, the predicted water quantity and quality within the pits will be compared to the measured water quantity and quality values that were sampled in the same year.

The comparison between the predicted water quantity and quality within the pits will be compared to the measured water quantity and quality done for 2012 to 2018. Because the Portage Pit was not deep enough to collect sufficient data from the sumps in 2011, this comparison used 2012 as a start point.

Appendix 15 provides a comparison between predicted (originally predicted in support of the NWB license) and measured water quantity within Portage, Goose and Vault Pit. The appendix includes the measured data for 2018, and also from 2012 to 2017.

Percent difference between the predicted and measured values for <u>water quantity and quality</u> was calculated using the following formula:

*% difference = ((A-B) / B)*100;*
where: A = measured value and B = predicted

The laboratory services selected by Agnico to analyze pit water quality (or any other water around mine site) are conducted by accredited facilities and reach the analysis lower detection limits where the results can be compared to the CCME guidelines. Agnico Eagle will continue to ensure that the accredited laboratory can reach the required detection limits.

<u>Water Quantity</u>

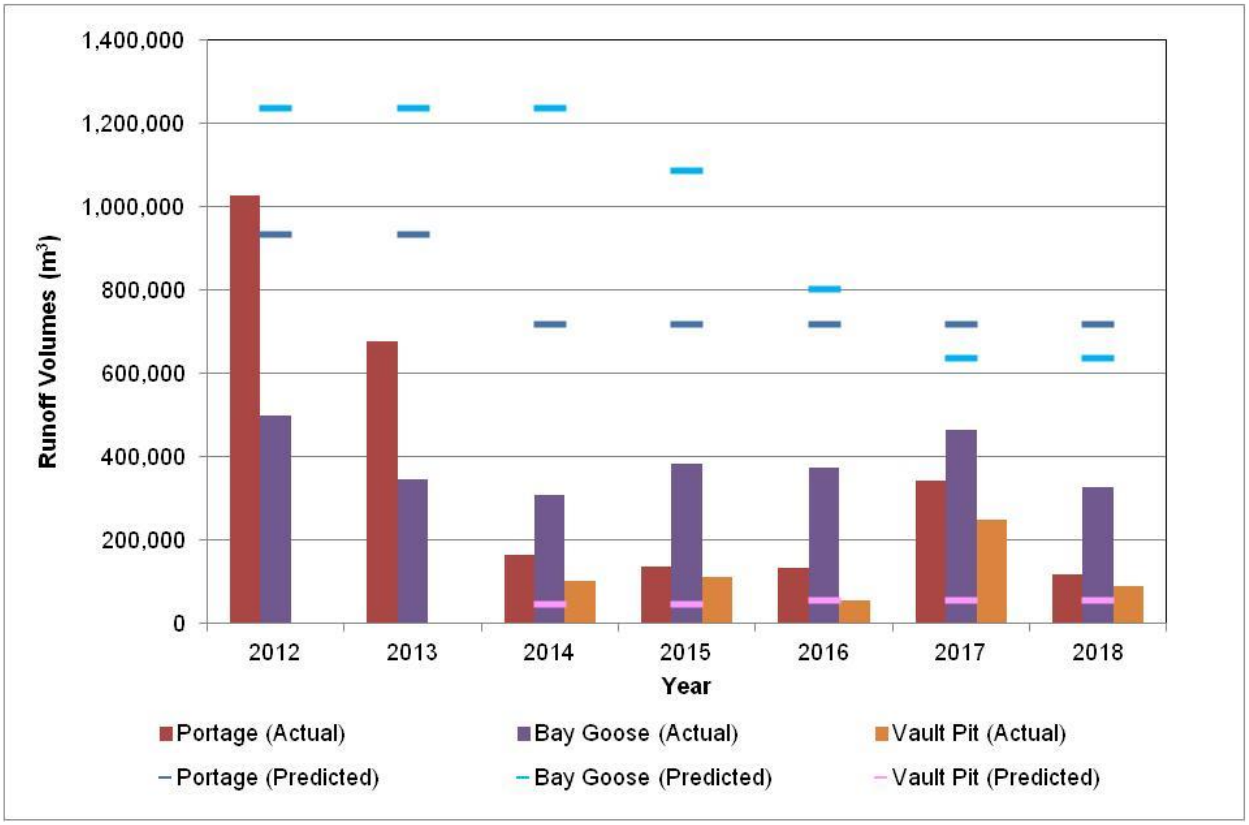
For Portage Pit, as presented in Appendix 15, the % difference between water volume predicted in Golder (2007) and water volume measured were less than predicted by more the 20% from 2013 to 2018. For 2012, the volume was slightly higher than predicted (+10%). This indicates that the seepage and groundwater sources and volumes predicted that collectively make up the water in the pits in 2013 to 2018, are less than what was originally predicted for operations. More specifically for 2018, Portage Pit was -84% less than the predicted value. Before 2014, seepage water from East Dike was pumped to the Portage Pit sump. However, as of January 2014, water from the East Dike Seepage has been pumped back to Second Portage Lake which contributes to significantly decrease the water quantity in Portage Pit between 2014 and 2018.

For Goose Pit, the % difference between water volume predicted in Golder (2007) and water volume measured in Goose Pit were less than predicted by more the 20% from 2012 to 2018. More specifically for 2018, Goose Pit was -49% less than the predicted value. This indicates that since 2012, the seepage and groundwater sources and volumes predicted that collectively make up the water in the Goose pit are less than what was originally predicted for operations. As the mining activity ceased in 2015 in Goose Pit, runoff, groundwater and seepage will contribute to the natural reflooding of the pit.

For Vault Pit, the % difference were higher by 120% in 2014 (commencement of mining operations) and 142% in 2015 between water volume predicted in Golder (2007) and water volume measured. This can be explained by the fact that there was more precipitation including larger freshet and rainfalls in 2015. In 2016, there was no significant difference between the predicted and measured volume (i.e. -1%). In 2017 however, the % difference was higher by 363% when comparing the predicted and measured volume, which could be caused by a larger freshet and rainfall flowing to Vault and Phaser Pits, as well as higher accumulation of snow in the area. In 2018, the estimated runoff volume reporting to Vault and Phaser Pits is 64% above the predicted value. In 2018, a large ice wall was formed in the Vault pit over the winter months. This phenomenon indicates a higher seepage flow rate entering the pit that was not accounted for in the original water balance. The main implication of the higher volumes of water to manage at the Vault Pit area is the requirement for longer pumping period than anticipated, which in turn translates to a higher consumption of diesel fuel to operate the pumps.

The following figure summarizes the runoff to the different pits measured from 2012 to 2018 and compares them against the forecasted values.

Figure 8. Meadowbank Summary of Runoff Volumes to the Pits



Water Quality

According to the original NWB application documents (Golder, 2007- Water Quality Predictions), a Probable scenario and a Possible Poor End scenario for predicted water quality results were evaluated. These models were developed to anticipate a representative range of water quality that would be used for management and mitigative decisions. The Probable scenario used input values that simulate predicted observed field conditions and added realistic scaling factors related to explosives management and pit operations. The Possible Poor End scenario input values simulated probable variance on observed field characteristics and selected input parameters to capture possible, conservative variance. The predicted values in the Probable scenario and the Possible Poor End scenario represented the summer averages.

The measured values for 2012 to 2018 are summarized in Appendix 15. The yearly mean and lower 25th percentile of all the data available throughout the year at Portage Pit (ST-17 and ST-19), Goose Pit (ST-20), Vault Pit (ST-23) and Phaser Pit (ST-41 and ST-42) were compared to the predicted values where data were available. The lower 25th percentile values were calculated and compared to the predicted values when 3 or more samples were taken during the year.

Furthermore, the measured data was also compared to the Water License discharge criteria to Third Portage Lake and Wally Lake, the MDMER and the CCME water quality guidelines for the protection of aquatic life. Sulphate concentrations were compare to a guideline value based on a threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013). It is understood that the Water Licence, MDMER and CCME criteria apply to mining effluents discharged to the environment and are as such not applicable to the pit water since it is managed within the site and undergoes a treatment step if required prior to discharge to the environment. These criteria are used as a guide to identify potential parameters of concern.

The following observations can be made for each year:

In 2012 (year 3 of the Life of Mine):

- For the Third Portage Pit sump:
    - Except for ammonia nitrogen (0%), dissolved barium (14%) and Sulphate (-6%) under Possible Poor End scenario, all the parameters exceeded +/-20% of difference between the predicted and mean measured values. All parameters exceeded for the Probable Scenario. For the lower 25th percentile, all parameters measured exceeded the predicted in the Probable scenario, except dissolved arsenic (4%), dissolved nickel (-14%) and nitrate (14%). All parameters exceeded +/-20% difference for the Possible Poor End scenario.
    - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, copper, fluoride, lead, cadmium, mercury, selenium, thallium and nitrate. Only cadmium exceeded the Water License criteria. No parameters exceeded the MDMER criteria.
- For Goose Pit:
    - All the parameters exceeded +/-20% of difference between the predicted (Probable and Possible Poor End scenarios) and mean measured values except for dissolved manganese (14%). For the lower 25th percentile, all parameters measured exceeded the

predicted (Probable and Possible Poor End scenarios), except dissolved barium (13% for both scenarios) and dissolved manganese (-15% for both scenarios).

  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, arsenic, copper, fluoride, lead, cadmium, mercury, selenium, thallium and nitrate. Cadmium and mercury exceeded the Water License criteria. No parameters exceeded the MDMER criteria.

In 2013 (year 4 of the Life of Mine):

- For the Third Portage Pit sump:
  - Except for ammonia nitrogen (+2%) and dissolved mercury (-7%) under Possible Poor End scenario, all the parameters exceeded +/-20% of difference between the predicted and mean measured values. All parameters exceed for the Probable Scenario, except pH (19%). For the lower 25th percentile, limited data are available, but available parameters measured exceeded the predicted in the Probable scenario and Possible Poor End scenario, except for pH (14% and 18% respectively).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, arsenic, copper, fluoride, lead, mercury and thallium. No parameters exceeded the MDMER and Water License criteria.
- For Goose Pit:
  - All the parameters exceeded +/-20% of difference between the predicted (Probable and Possible Poor End scenarios) and mean measured values except hardness (2% for both scenarios) and dissolved cadmium (-12% for both scenarios). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, copper, fluoride, nickel, cadmium, mercury, selenium, thallium and nitrate. Nitrate exceeded the Water License criteria. No parameters exceeded the MDMER criteria.

In 2014 (year 5 of the Life of Mine):

- For Vault Pit:
  - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor scenarios) versus the mean of measured values in Vault Pit were found for all of the parameters except for pH (-11% for both scenarios).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, arsenic, copper, fluoride, nickel, cadmium, mercury, molybdenum, selenium, thallium and nitrate. No parameters exceeded the MDMER and Water Licence criteria.
  - Sulphate concentration was higher than the threshold value.
- For Goose Pit:

- The mean water quality concentrations measured in the Goose Pit sump exceeded 20% predicted concentrations for all the parameters except for dissolved barium (4% for both scenarios) and dissolved copper (5% for both scenarios). For the lower 25th percentile, all available parameters measured exceeded the predicted (Probable and Possible Poor End scenarios).
- The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, fluoride, mercury, thallium and nitrate. No parameters exceeded the MDMER and Water Licence criteria.

- It should be noted that in 2014 no water from South Portage Pit sump was sampled because the access to the sump presented health and safety issues for the technicians and water was pumped only for 3 months (August to October). All sump water was pumped to the South Cell TSF for use as reclaim water in the mill.

In 2015 (year 6 of the Life of Mine):

- For Vault Pit:
  - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor End scenarios) versus the mean of measured values in Vault Pit were found for all of the parameters except for pH (-11% for both scenarios) and nitrate (-8%, Probable scenario).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, fluoride, iron, molybdenum, selenium, thallium and nitrate. Ammonia nitrogen exceeded the Water License criteria. No parameters exceeded the MDMER criteria.
- For Goose Pit:
  - The mean water quality concentrations measured in the Goose Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters except for dissolved molybdenum (16%). For the lower 25th percentile, all available parameters measured exceeded the predicted (Probable and Possible Poor End scenarios), except for pH (16% for both scenarios) and dissolved molybdenum (3% for both scenarios).
  - The following measured parameters were found to be higher than the CCME guidelines: fluoride, nickel, selenium, thallium and nitrate. No parameters exceeded the MDMER and Water Licence criteria.
- For Third Portage Pit:
  - The mean water quality concentrations measured in the Third Portage Pit sump exceeded 20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters except for pH (6% and 9% respectively) and the fluoride (10% for Possible Poor End). For the lower 25th percentile, all available parameters measured exceeded the predicted values for both scenarios, except for pH (1% and 4% respectively).

  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, arsenic, fluoride, selenium, thallium and nitrate. No parameters exceeded the MDMER and Water License criteria.
  - Sulphate concentration was higher than the threshold value.

- For North Portage pit:
  - The mean water quality concentrations measured in the North Portage Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor End scenario for all the parameters except for nitrate (-8% and 19% respectively). For the lower 25th percentile, all available parameters measured exceeded the predicted value except for pH (18% for Probable scenario) and sulphate (-3%, for Possible Poor End scenario).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, arsenic, fluoride, nickel, thallium and nitrate. No parameters exceeded the MDMER and Water License criteria.
  - Sulphate concentration was higher than the threshold value.

In 2016 (year 7 of the Life of Mine):

- For Vault Pit:
  - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor End scenarios) versus the mean of measured values in Vault Pit were found for all of the parameters except for pH (-3% for both scenarios) and dissolved barium and molybdenum (9% and -10% respectively for Possible Poor End scenario). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios), except for pH.
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, copper, fluoride, cadmium, selenium and nitrate. No parameters exceeded the MDMER and Water License criteria.
  - Sulphate concentration was higher than the threshold value.
- For Goose Pit:
  - The mean water quality concentrations measured in the Goose Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters except for dissolved copper (-7%) and nitrate (-7%). For the lower 25th percentile, all available parameters measured exceeded the predicted (Probable and Possible Poor End scenarios), except for nitrate (-11% for both scenarios).
  - The following measured parameters were found to be higher than the CCME guidelines: fluoride, nickel and nitrate. No parameters exceeded the MDMER and Water Licence criteria.
- For Third Portage Pit:
  - The mean water quality concentrations measured in the Third Portage Pit sump exceeded 20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters except for hardness (-9% and -12% respectively), dissolved cadmium, mercury and magnesium (-11%, -7%, -11% respectively for Possible Poor

End) and nitrate (9% for Possible Poor End). For the lower 25th percentile, all available parameters measured exceeded the predicted values for both scenarios.

- The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, fluoride, cadmium, mercury, molybdenum, selenium and nitrate. No parameters exceeded the MDMER and Water License criteria.
- Sulphate concentration was higher than the threshold value.

- For North Portage Pit:
  - The mean water quality concentrations measured in the North Portage Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor End scenario for all the parameters except for nitrate (-2% for Probable scenario). For the lower 25th percentile, all available parameters measured exceeded the predicted value except for dissolved barium (15% for Possible Poor End scenario) and nitrate (-3% for Probable scenario).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, arsenic, fluoride, nickel, cadmium, molybdenum, selenium and nitrate. No parameters exceeded the MDMER and Water License criteria.
  - Sulphate concentration was higher than the threshold value.

In 2017 (year 8 of the Life of Mine):

- For Vault Pit:
  - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor End scenarios) versus the mean of measured values in Vault Pit were found for all of the parameters except for pH (-4% for both scenarios) and dissolved barium (-3% for Possible Poor End scenario). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios), except for pH and selenium.
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, fluoride, iron, selenium and nitrate. No parameters exceeded the MDMER and Water License criteria.
  - Sulphate concentration was higher than the threshold value.
- For Goose Pit:
  - The mean water quality concentrations measured in the Goose Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters except for dissolved copper (-9%), hardness (+8%) and molybdenum (-19%). For the lower 25th percentile, all available parameters measured exceeded the predicted (Probable and Possible Poor End scenarios), except for hardness (-1% for both scenarios).
  - The following measured parameters were found to be higher than the CCME guidelines: unionized ammonia (mean value of 0.018 vs CCME guideline of 0.016), fluoride, nickel, selenium and nitrate. No parameters exceeded the MDMER and Water Licence criteria.
  - Sulphate concentration was higher than the threshold value.

- For Third Portage Pit:
    - The mean water quality concentrations measured in the Third Portage Pit sump were equal or exceeded 20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters. For the lower 25th percentile, all available parameters measured exceeded the predicted values for both scenarios, except for ammonia nitrogen and selenium.
    - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, fluoride, mercury, selenium and nitrate. No parameters exceeded the MDMER and Water License criteria.
    - Sulphate concentration was higher than the threshold value.
- For North Portage Pit:
    - The mean water quality concentrations measured in the North Portage Pit sump were equal or exceeded +/-20% predicted concentrations for Probable and Possible Poor End scenario for all the parameters except for nitrate (-12% for Possible Poor End scenario). For the lower 25th percentile, all available parameters measured exceeded the predicted value except for dissolved barium (0% for Possible Poor End scenario) and nitrate (-14% for Possible Poor End scenario).
    - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, arsenic, fluoride, nickel, cadmium and nitrate. No parameters exceeded the MDMER and Water License criteria.
    - Sulphate concentration was higher than the threshold value.

In 2018 (year 9 of the Life of Mine):

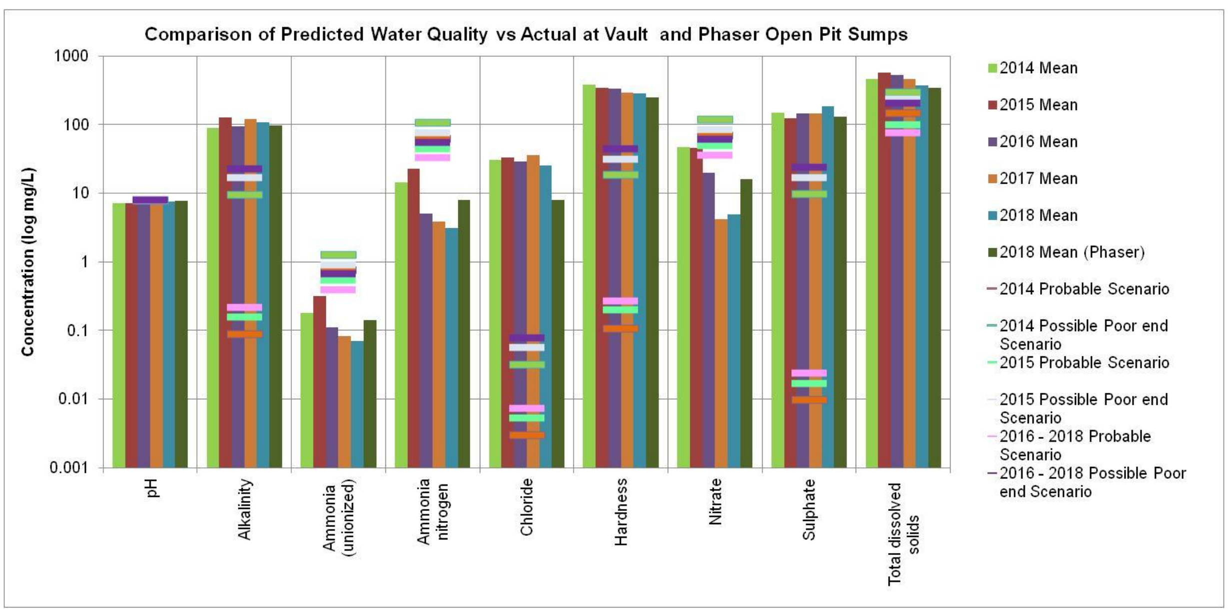
- For Vault Pit:
    - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor End scenarios) versus the mean of measured values in Vault Pit were found for all of the parameters except for pH (-6% for both scenarios), dissolved barium (-10% for Possible Poor End scenario), and for dissolved Molybdenum (-18% for Possible Poor End scenario). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios), except for pH (-8% for both scenarios), and dissolved cadmium (+11% for Possible Poor End scenario).
    - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.07 mg/L vs CCME guideline of 0.016 mg/L), ammonia nitrogen (mean value of 3.1 mg/L vs CCME guideline of 1.83 mg/L), fluoride (mean value of 0.2 mg/L vs CCME guideline of 0.12 mg/L), dissolved cadmium (mean value of 0.000162 mg/L vs CCME guideline of 0.00004 mg/L), and nitrate (mean value of 4.9 mg/L vs CCME guideline of 2.94 mg/L). No parameters exceeded the MDMER and Water Licence criteria.
    - Sulphate concentration was higher than the threshold value.
- For Phaser Pit:

   - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor End scenarios) versus the mean of measured values in Phaser Pit were found for all of the parameters except for pH (-6% for both scenarios). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios), except for dissolved iron (+4% for Possible Poor End scenario) and dissolved zinc (+15% for Possible Poor End scenario).
   - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.14 mg/L vs CCME guideline of 0.016 mg/L), ammonia nitrogen (mean value of 8.0 mg/L vs CCME guideline of 1.83 mg/L), dissolved copper (mean value of 0.0088 vs CCME guidelines of 0.002 mg/L), fluoride (mean value of 0.18 mg/L vs CCME guideline of 0.12 mg/L), dissolved cadmium (mean value of 0.00005 mg/L vs CCME guideline of 0.00004 mg/L) and nitrate (mean value of 15.8 mg/L vs CCME guideline of 2.94 mg/L). No parameters exceeded the MDMER and Water Licence criteria.
   - Sulphate concentration was slightly higher than the threshold value.
- For Goose Pit:
   - The mean water quality concentrations measured in the Goose Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters except for hardness (-18%), dissolved barium (9%), dissolved cadmium (18%), and dissolved manganese (-4%). 25th percentile couldn't be calculated due to insufficient data (less than 3 measurements).
   - The following measured parameters were found to be higher than the CCME guidelines: unionized ammonia (mean value of 0.03 mg/L vs CCME guideline of 0.016 mg/L), fluoride (mean value of 0.25 mg/L vs CCME guideline of 0.12 mg/L), dissolved cadmium (mean value of 0.00005 mg/L vs CCME guideline of 0.00004 mg/L), and nitrate (mean value of 6.03 mg/L vs CCME guideline of 2.94 mg/L). No parameters exceeded the MDMER and Water Licence criteria.
   - Sulphate concentration was higher than the threshold value.
- For Third Portage Pit:
   - The mean water quality concentrations measured in the Third Portage Pit sump were equal or exceeded 20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters, except for ammonia nitrogen (probable -1%), dissolved mercury (probable -15%), and dissolved selenium (possible poor -17%). 25th percentile couldn't be calculated due to insufficient data (less than 3 measurements).
   - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.04 mg/L vs CCME guideline of 0.016 mg/L), ammonia nitrogen (mean value of 2.1 mg/L vs CCME guideline of 1.83 mg/L), fluoride (mean value of 0.29 mg/L vs CCME guideline of 0.12 mg/L), dissolved cadmium (mean value of 0.00006 mg/L vs CCME guideline of 0.00004 mg/L), and nitrate (mean value of 6.88 mg/L vs CCME guideline of 2.94 mg/L). No parameters exceeded the MDMER and Water License criteria.
   - Sulphate concentration was higher than the threshold value.

- For North Portage Pit:
  - The mean water quality concentrations measured in the North Portage Pit sump were equal or exceeded 20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters. 25th percentile couldn't be calculated due to insufficient data (less than 3 measurements).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.03 mg/L vs CCME guideline of 0.016 mg/L), fluoride (mean value of 0.25 mg/L vs CCME guideline of 0.12 mg/L), dissolved cadmium (mean value of 0.00005 mg/L vs CCME guideline of 0.00004 mg/L), and nitrate (mean value of 6.03 mg/L vs CCME guideline of 2.94 mg/L). No parameters exceeded the MDMER and Water License criteria.
  - Sulphate concentration was higher than the threshold value.

Figures 9 to 12 on the following pages illustrate the measured annual mean concentrations (represented by the vertical bars) and the probable and possible poor scenario (represented by horizontal lines). It is possible to observe that some parameters fall in between the probable and possible poor limits, such as dissolved iron in the Third Portage Pit, Goose Pit and North Portage Pit. Third Portage Pit is the pit where the majority of the parameters have measured concentrations that are within or below the forecasted limits. Graphics for the 25th percentile data were not plotted since there are years where not enough samples were taken to statistically evaluate this value.

Figure 9. Meadowbank Mean Annual Water Quality - Vault and Phaser Open Pit Sumps



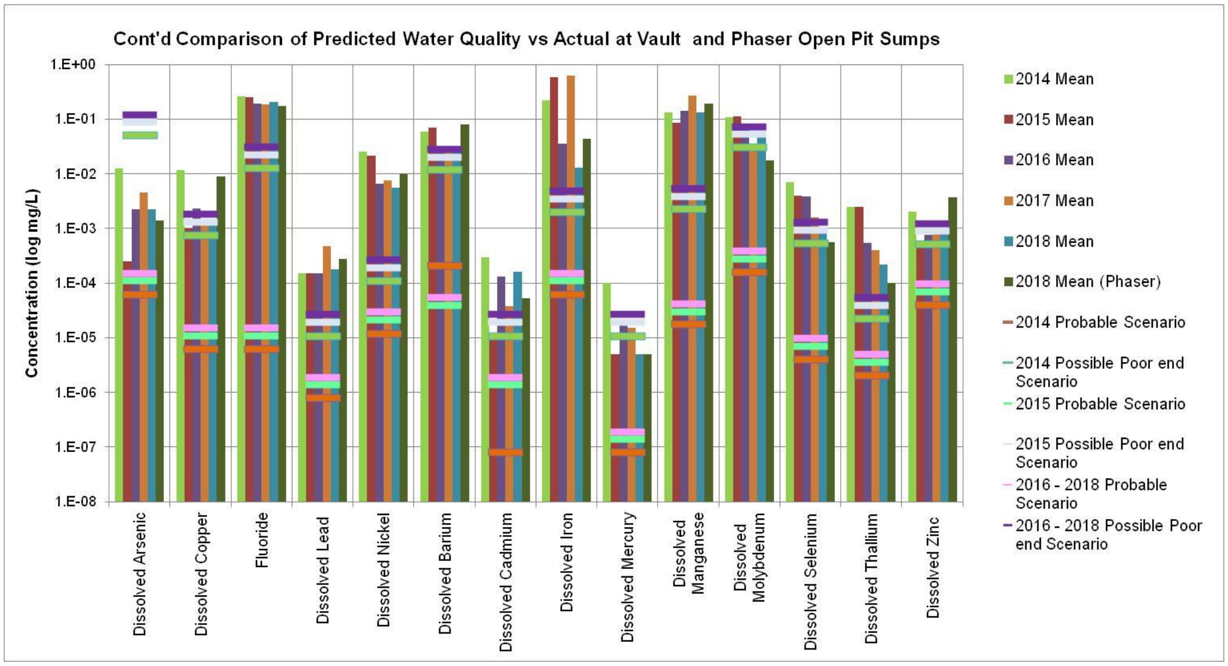
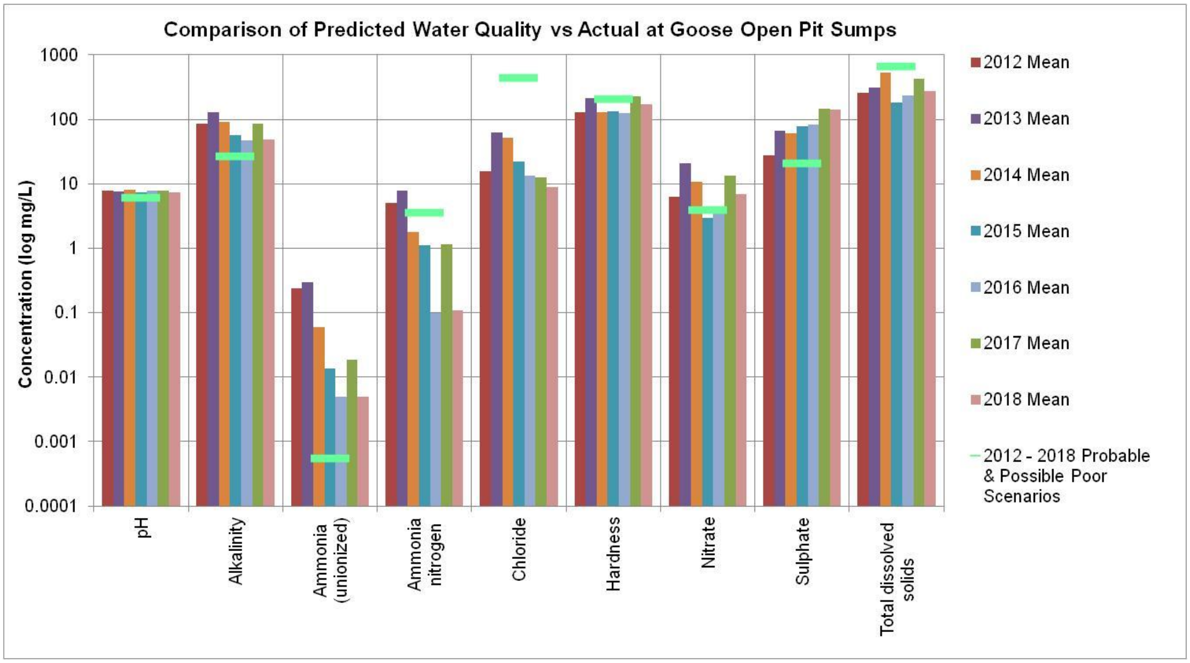

Cont'd Comparison of Predicted Water Quality vs Actual at Vault and Phaser Open Pit Sumps
Concentration (log mg/L)
1.E+00
1.E-01
1.E-02
1.E-03
1.E-04
1.E-05
1.E-06
1.E-07
1.E-08
Dissolved Arsenic
Dissolved Copper
Fluoride
Dissolved Lead
Dissolved Nickel
Dissolved Barium
Dissolved Cadmium
Dissolved Iron
Dissolved Mercury
Dissolved Manganese
Dissolved Molybdenum
Dissolved Selenium
Dissolved Thallium
Dissolved Zinc
2014 Mean
2015 Mean
2016 Mean
2017 Mean
2018 Mean
2018 Mean (Phaser)
2014 Probable Scenario
2014 Possible Poor end Scenario
2015 Probable Scenario
2015 Possible Poor end Scenario
2016 - 2018 Probable Scenario
2016 - 2018 Possible Poor end Scenario

Figure 10. Meadowbank Mean Annual Water Quality – Goose Open Pit Sumps



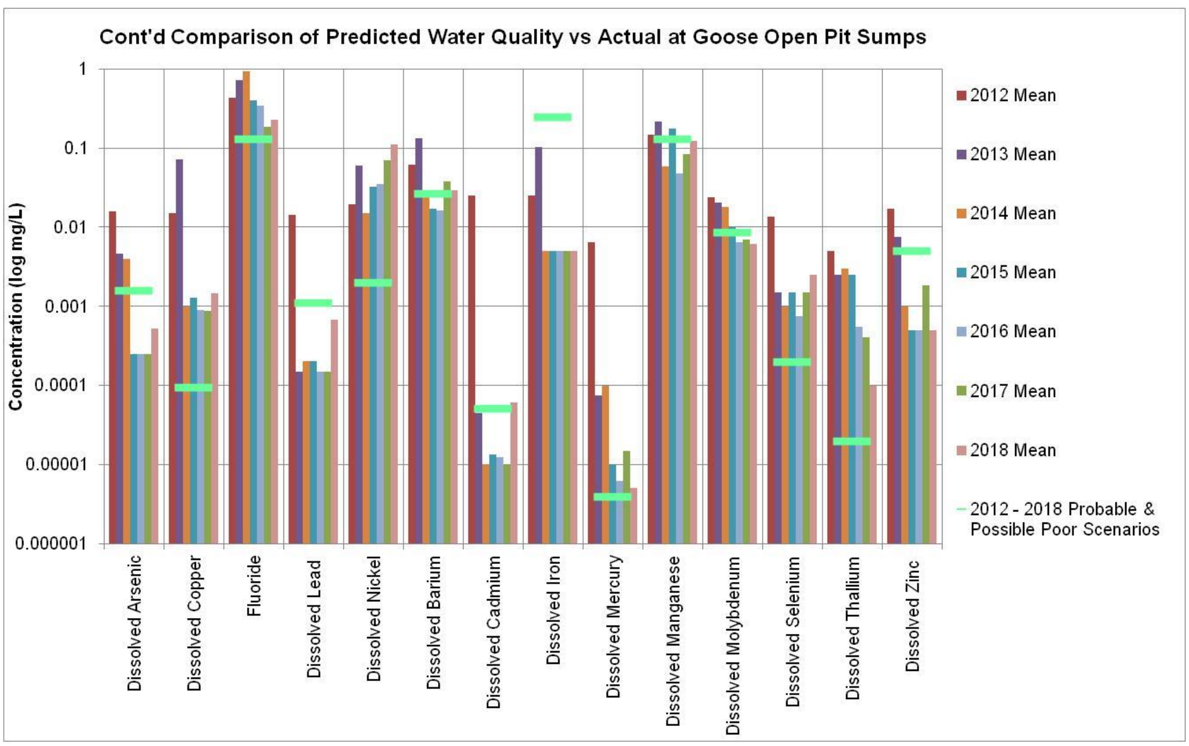
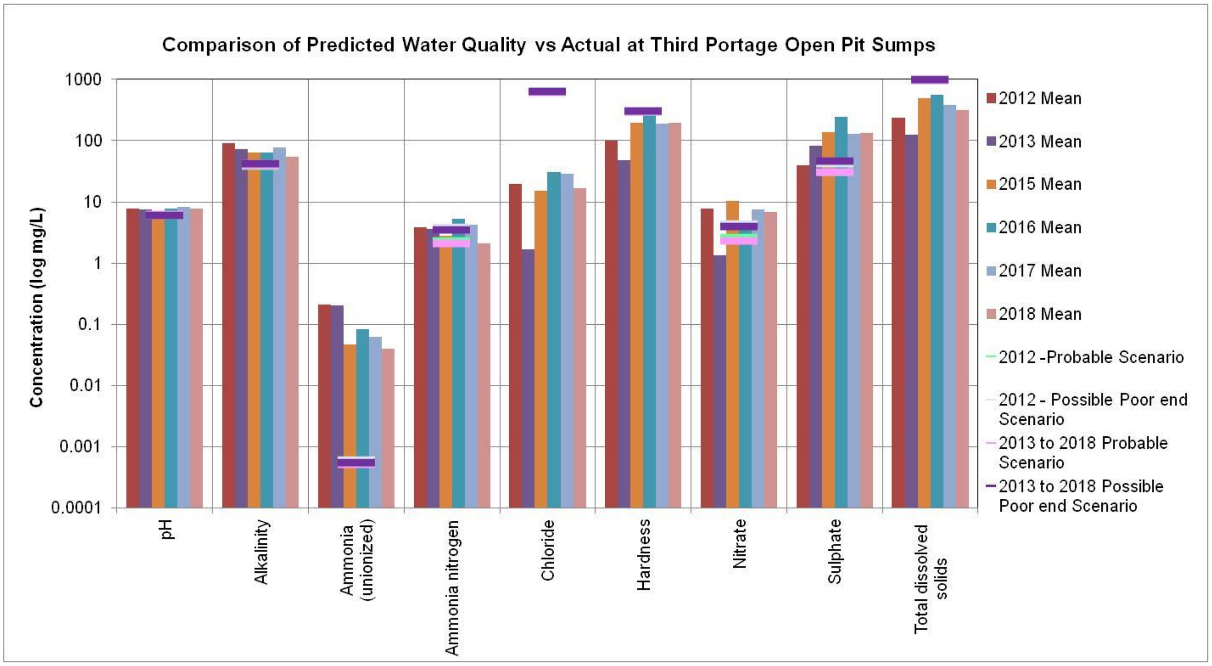


Figure 11. Meadowbank Mean Annual Water Quality – Third Portage Pit Sumps



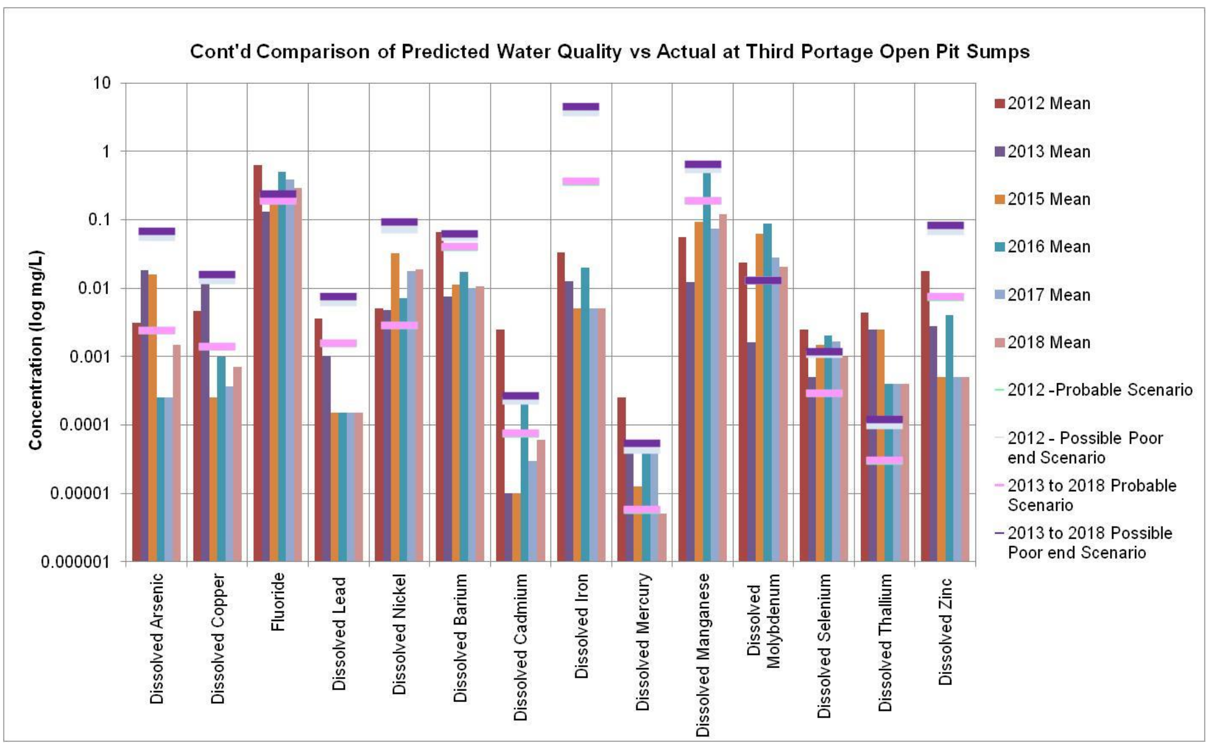
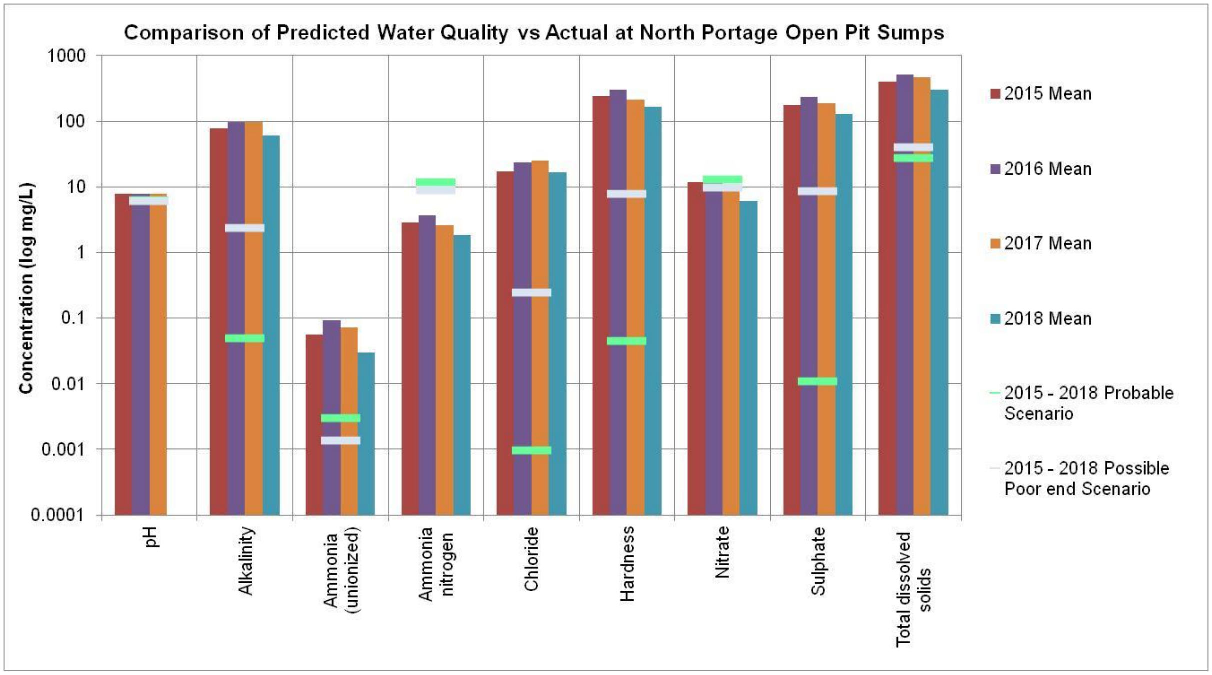
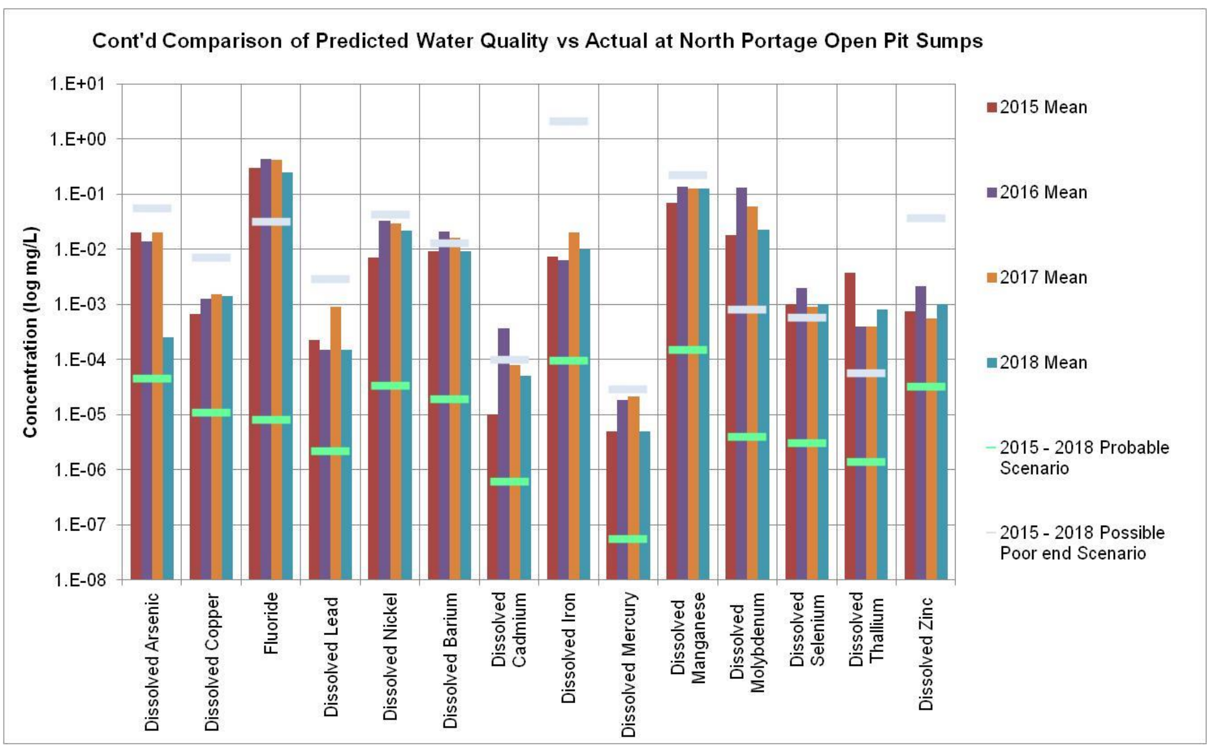


Figure 12. Meadowbank Mean Annual Water Quality – North Portage Pit Sumps





Based on this analysis, many of the predicted values for the Probable and Probable Poor End scenarios have differences greater than +/- 20% when compared to the measured values. There are several potential causes that could contribute to these differences:

- For Portage and Goose Pits, the predicted water volumes were significantly less than what was originally predicted, specifically from 2012 to 2018. This reflects the fact that seepage, ground water and local runoff volumes were being managed and less water than what was originally predicted was reporting to the pit sumps. Consequently, there is less volume of water to attenuate any contaminant loads that may accumulate in the pit sump water body.
- The higher contaminant loads measured in the pit water can also be contributed to a higher observed load in the seepages flowing into the pits.
- Some accredited laboratory water quality measurements have detection limits that are higher than the predicted values. This is particularly true for dissolved metal analysis, such as cadmium, iron, lead, nickel, molybdenum, selenium, thallium and zinc.
- The pH measured in Portage and Goose pits is generally higher than the predicted values. A possible cause for this phenomenon is that the groundwater infiltrating into the pits have a higher alkalinity concentration and pH when compared against the background water quality of the surrounding Third Portage Lake.
- Un-ionized ammonia concentration in water is greatly influence by the pH. The higher the pH, the higher the fraction of un-ionized ammonia in the water. The predicted pH of the Portage and Goose pit water is between 6.1 and 6.3, while the measured values are generally between 7.0 and 8.3.

Furthermore, there are many parameters in the pit water that are slightly higher or higher than the CCME water quality guidelines for the protection of aquatic life. Some parameters, such as ammonia and nitrate, are present in the pit water from the use of explosive during the pit development. Other parameters found in the pit water could originate from the natural groundwater seepage into the pit (i.e. fluoride, sulphates, etc.) or from contact of runoff water and seepage water with potentially acid generating (PAG) rock surfaces of the pit wall.

However, it is important to note that the water from all the pits is extensively monitored and is not discharged directly into the environment:

- For Portage and Goose Pit sump water, no water was discharged to the environment from these pits. Up until November 2014, the pit water was transferred to the former Attenuation Pond. The water accumulated in the Attenuation Pond was sent to the Tailings Storage Facility or treated by the Water Treatment Plant (WTP) before being discharged in the Third Portage Lake. No discharge limits were exceeded in 2012, 2013 and 2014 as all the results are below the maximum value required by NWB (Water License 2AM-MEA1526) and Environment and Climate Changes Canada (MDMER). It should also be noted that since the South Cell Tailings Storage Facility was put into operation (November, 2014), no additional water from the former Portage Attenuation Pond has been discharged into the receiving environment during mining operations. Since mining activities are completed in Goose, all water inflows will remain in Goose Pit and form part of the natural re-flooding volume (since July 2015).
- For Vault and Phaser Pits sump water, the pit water reports to the Vault Attenuation Pond. The water accumulated in the Vault Attenuation Pond could be treated by the WTP, if required, until

the end of 2017 for Total Suspended Solids (TSS) removal before discharge into the receiving environment (Wally Lake). The results of the Vault discharge can be found in Section 8.3.3.4 under sampling ST-10 (discharge). No discharge limits were exceeded in 2014, 2015, 2016 and 2017, as all the results are below the maximum average concentration value required by NWB (Water License 2AM-MEA1526) and Environment and Climate Changes Canada (MDMER). In 2018, there was no discharge to the environment.

The sample results from Portage, Goose, Vault and Phaser Pits will continue to be monitored in the future and the results will be considered in the water quality modelling, revised yearly, to assist in informing management of water quality in the pits during closure. All factors including the proportional volume of pit water and reclaim water in the TSF, as well as possible implementation of mitigative measures during operation and closure, will be considered when deciding if water treatment will be required at closure. All of this information including the applicable parameters are integrated into the water quality model and is discussed in the subsequent section.

Water Quality Forecast model - Pit Water Quality

The Water Quality Forecast model is completed yearly with the updated, measured data from site, as well as the water balance used on site. Review of the water quality predictions for pit reflooding is completed in this forecast. Table 4.1 of the Meadowbank Water Quality Forecasting Update for the 2018 Water Management Plan found in Appendix C of the 2018 Water Management Report and Plan (Appendix 8) summarizes the forecasted concentrations of applicable parameters in Portage and Goose Pits (based on measured water quality from the TSF) predicted in the pits after reflooding and compares them to originally predicted concentrations for Goose and Portage.

Based on the results of the water quality mass balance presented in Section 4.2 of the Meadowbank Water Quality Forecasting Update for the 2018 Water Management Report and Plan (Appendix 8) treatment may be required for aluminium, arsenic, cadmium, chromium, copper, iron, nickel, selenium and fluoride as the forecasted pit water quality may exceed CCME guidelines or other site specific criteria developed during the closure process prior to dike breaching, if the water is not treated. Mercury and lead could also potentially be parameter of concerns. The addition of these two new parameters is mainly due the milling and deposition of tailings from ore body extracted from Whale Tail pit at the Amaruq site. The ore body at Whale Tail pit has a different geochemical behavior when compared to the ore body from Portage/Goose/Vault pits. Total nitrogen forecasted concentration at closure is also higher than the threshold concentration adopted for Oligotrophic Lake in terms of nutrient concentration.

For the Vault pit, no treatment would likely be required after the pit has been re-flooded prior to dike breaching. This is largely due to the fact that there is no interaction of contact water with a tailings disposal facility at the Vault site and all parameters are expected to meet the CCME guidelines or other site specific criteria developed during the closure process. Table 5.1 of the Meadowbank Water Quality Forecasting Update for the 2018 Water Management Report and Plan (Appendix 8) presents the average concentrations of water quality from samples taken in the Vault area in 2018.

With respect to the potential elevated levels of metals and total nitrogen mentioned above, treatment could be undertaken at the South Cell Reclaim Pond prior to its transfer to Portage Pit and pit reflooding if the trends shown in the model continue to be noted. The treatment approach will include the removal of Total Suspended Solids (TSS) and metal using a physico-chemical treatment process. Chemicals will be added such as a coagulant to remove TSS and lime, caustic soda or sulfide based chemical to precipitate out the metals. A polishing step could be added to further adsorb any remaining dissolved metals in the water. Aeration is recommended for total nitrogen reduction via ammonia volatilization. An additional coagulation-clarification process could be a potential treatment solution for removal of arsenic and fluoride.

Forecasted selenium concentration also exceeds the CCME guidelines in Portage and Goose Pits. Consequently, treatment may be required. This parameter still requires close monitoring.

For the Vault area, ammonia and nitrate are the parameters of concern identified by Environment and Climate Change Canada, but no actual or forecasted concentration exceeds the Type A Water License discharge requirements for this area.

It is important to note that the water quality in the pits will be subject to CCME guidelines or site specific criteria at closure once the water level in the Goose and Portage Pits are equal to the water level in the Third Portage Lake. The dikes will only be breached once the water quality in the pits meets CCME guidelines or site specific criteria developed during the closure plan approval process. This applies also for the Vault area.

4.4.3.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Part E, Item 9: ***The Licensee shall, on an annual basis during Closure, compare the predicted water quantity and quality within the pit and lake, to the measured water quantity and quality. Should the difference between the predicted base case values 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.***

Whale Tail Project was in construction phase in 2018. This comparison will be provided once in closure.

4.5 HYDRODYMANIC STUDIES WHALE TAIL SITE

As required by NIRB Project Certificate No.008 Condition 6: ***The Proponent shall provide a summary of activities undertaken to address the requirements of this term and condition in annual report(s) to the NIRB. The Proponent shall:***

> ***a) Conduct detailed hydrodynamic modelling during operations and closure to evaluate the mixing of the Waste Rock Storage Facility seepage into Mammoth Lake post-closure; and***
>
> ***b) Based on the results of the modelling implement monitoring programs and adaptive management strategies that minimize the need for active intervention, including long-term treatment of mine contact water.***

Development of the Whale Tail deposit will create a 150-m deep pit lake and a 20-m-deep water Attenuation Pond, within the North Basin of Whale Tail Lake. At the end of mine life, these areas will be flooded into a single water body again and re-joined with the South Basin of Whale Tail Lake. The mine and water management plans of the Project were assessed in the Environmental Impact Assessment that was submitted to the Nunavut Water Board on November 25, 2016 and subsequently approved.

Mammoth Lake has been considered as the discharge location for mine water from the Whale Tail Pit Lake and will also receive runoff from the Waste Rock Storage Area during the post-closure period of the Project. To assess the effects of the Phase 1 mine plan on the water quality of Mammoth Lake, a hydrodynamic model was applied to simulate the circulation of lake water and resulting concentration of constituents within the waterbody over a 25-year period, from 2017 to 2042. Total arsenic and total phosphorus concentrations in Mammoth lake were modelled using the three dimensional (3-D), hydrodynamic modelling program GEMSS (Generalized Environmental Modelling System for Surface waters, 2018). A 3-D model was selected over the 2-D model owing to the wide surface area and complex geometry of the lake relative to the specific inputs.

The model simulations indicated the following:

- Mammoth Lake is predicted to be well-mixed during operations, closure, and post-closure.

- Total arsenic concentrations in Mammoth Lake during operations, closure, and post-closure are predicted to meet Site-specific Water Quality Objectives (SSWQO) of 0.025 mg/L during open water seasons. A short-lived spike is predicted to occur when the WRSF cover reaches field capacity water content and releases stored mineral products modelled to accumulate over time. This is predicted to occur through a short-lived flushing event. After this, concentrations decrease to below the SSWQO into post-closure.

- Total phosphorus concentrations in Mammoth Lake show a temporary increase during operational discharge of treated effluent to slightly higher than the upper range for oligotrophic conditions, as was predicted in the Project EA. These concentrations are predicted to decrease after discharge is stopped. A short-live spike is predicted to occur when the cover reaches field capacity; concentrations decrease to stay within the oligotrophic range after this flushing event.

- The formation of ice may not have a significant effect on lake water constituent concentration below the ice in winter given the low TDS of Mammoth Lake water during operations, closure and post-closure. As a conservative measure, this process was evaluated and shows that concentrations could periodically rise in winter below the ice if cryo-concentration becomes significant, if mine plans changed and/or if effluent salinity was elevated.

Text above is a summary of the major finding of the hydrodynamic modelling. Refer to complete report Hydrodynamic Modelling of Mammoth Lake (Appendix 16) for more details.

4.6 ADDITIONAL INFORMATION

4.6.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 25: ***Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported.***

No additional information was requested in 2018.

4.6.2 Whale Tail Site

As required by Water License 2AM-WTP1826 Schedule B, Item 25: ***Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported.***

No additional information was requested in 2018.

4.6.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6n: ***Any other details on water use or waste disposal requested by the Board by the 1st of November of the year being reported***

No additional information was requested in 2018.

SECTION 5. WASTE ROCK MANAGEMENT ACTIVITIES

5.1 GEOCHEMICAL MONITORING

5.1.1 Meadowbank Site

As required by NIRB Project Certificate No.004 Condition 15: ***Within two (2) years of commencing operations re-evaluate the characterization of mine waste materials, including the Vault area, for acid generating potential, metal leaching and non-metal constituents to confirm FEIS predictions, and re-evaluate rock disposal practices by conducting systematic sampling of the waste rock and tailings in order to incorporate preventive and control measures into the Waste Management Plan to enhance tailing management during operations and closure; results of the re-evaluations shall be provided to the NWB and NIRB's Monitoring Officer.***

And

In accordance with NWB Water License 2AM-MEA1526 Schedule B, Item 7: ***Geochemical monitoring results including:***

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

In 2018, Agnico sampled approximately 25% of blast holes and analyzed 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 weight % by 31.25 which yields an MPA value in Kg $CaCO_3$ equivalent. The Total Inorganic Carbon analysis is similarly converted into a Carbonate Neutralization Potential (NP) by multiplying the Total weight % Inorganic Carbon (reported as $\%CO_2$) by 22.7 which yields an NP value in Kg $CaCO_3$ equivalent. The Net Potential Ratio (NPR) for the blast hole drill cutting sample is then calculated as follows: NPR = NP/MPA. See Table 5.1 for a summary of Acid Rock Drainage (ARD) Guidelines used to classify Meadowbank waste rock. The operational acid/base accounting used for waste rock designation (PAG and NPAG rock) is described as well as the frequency of sampling in the Operational ARD/ML Testing and Sampling Plan (Version 2, 2013). Once characterized by the geology team, the waste rock material is segregated and placed in appropriate location.

As per KIA recommendation to the 2015 Annual Report: "*Agnico should provide a summary in the Annual Report of the proportion of PAG, NPAG and uncertain waste rock found in the sampling of 25% of blast holes*." In 2018, Agnico analyzed 11,172 samples from blast hole at Vault at his on-site laboratory. Of these samples, 10 % are PAG, 15 % are uncertain and 76 % are NPAG. For Portage, Agnico analyzed 7,243 samples from blast hole at his on-site laboratory. Of these samples, 44% are PAG, 6 % are uncertain and 50 % are NPAG.

Table 5.1. Summary of ARD Guidelines used to classify Meadowbank Waste

Initial Screening Criteria	ARD Potential
NPR< 1	Likely Acid Generating (PAG)
1 < NPR < 2	Uncertain
2 < NPR	Acid Consuming Non Potentially Acid Generating (NPAG)

The mine geology staff uses the derived NPR to characterize the rock in the blast pattern. Mine surveyors use 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. See Section 5..2.1 and Table 5.4 for a discussion of the use and location of waste rock.

Segregation of ore, waste rock as potentially acid generating (PAG) or non-potentially acid generating (NPAG) material based on operational testing during mining activity to differentiate waste rock type is part of the Meadowbank Waste Rock Management Plan. Sampling and testing of waste materials for acid rock drainage (ARD) is conducted during mine operation in order to segregate PAG waste from NPAG waste rock material, so that waste material can be assigned to specific locations or use. This practice has been ongoing since the beginning of the mining operations at Meadowbank, and will continue during the remaining operation period. Operational sampling and analysis is completed on site during mining activities in order to identified and delineate the material type in the pits during mining. As describe above, Agnico sampled approximately 25% of all blast holes and analyzed the percentages of Sulphur and carbon. The results from these analyses are used to differentiate the PAG and NPAG materials. Once characterized, the waste rock material is segregated and placed in appropriate location. The geochemical properties of all Meadowbank mining wastes have been confirmed with duplicates samples sent to certified laboratory, through both static and kinetic testing on numerous representative samples, by various test methods and through multiple project development stages.

The results of the 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 upon request.

Information regarding the waste rock characterization is also managed and recorded by the mine dispatch Wenco system, tracking in real time load of material, including waste rock, and their respective destination. The system and the dispatcher in charge, guides the operators and ensures the ore and waste rock material is transported to the appropriate destination. The system displays in real time information about equipment location and destination, as well as pit development information. All production data, including all waste rock haulage to the PAG and NPAG waste rock storage facilities (RSF), as well as construction use are recorded into a database.

In 2018, to validate the method used by Agnico, approximately 368 samples (including 134 samples from Vault and 234 from Portage)) from production drill holes in Portage and Vault Pits 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, metal leaching using the Shake Flask Method, bulk metals analysis and for whole rock analysis. The results from the external laboratory confirmed Agnico's methodology and results to differentiate PAG/NPAG rock.

In its recommendations to the 2014 Annual Report, the NIRB requested that Agnico *provide a comparison of its results with the FEIS predictions and an explanation of how it re-evaluated rock disposal practices in order to incorporate preventative and control measures into the Waste Management Plan*. This information is provided below.

In the FEIS, Vault waste rock was found to be 100% Intermediate Volcanic (IV). Agnico's characterization of the Vault waste rock found that it is mostly comprised of IV group rocks, however a small portion is also iron formation. Ultimately, the FEIS was functionally accurate as the IV provides a high buffering capacity, low leachability and is considered NPAG.

Data collected for internal control during operations at Vault was compared to the Vault geochemical FEIS (Golder, 2005). The Vault and Portage database from Agnico included results for analyzed at the on-site laboratory for total sulphur, buffering capacity (NP) , acid potential (AP), the ratio of NP to AP (NRP) and total carbon. Starting at the end of 2014, Agnico sent quarterly samples to an accredited laboratory to validate Agnico internal determination of Vault waste rock. The Vault FEIS prediction said that the ARD from Vault rock will be low which was consistent with Agnico findings. In the FEIS, it was determined that 14% of the rock will be PAG, 11% uncertain and 75% NPAG. Analysis from Agnico's internal determination shows that in 2018, as previously said, for Vault material, 10 % are PAG, 15 % are uncertain and 76% are NPAG. Ultimately, there is a slightly higher ratio of NPAG versus what was initially predicted. Similar results were obtained in previous year 2014-2017 (Table 5.2). As a mitigative measure any PAG or uncertain waste rock material is placed in the middle of the Vault Waste Rock Storage Facility while NPAG material is placed on the perimeter to encapsulate the PAG material. Runoff or seepage water monitoring analysis will confirm the effectiveness of this abatement measure. To date water monitoring analysis from run off indicates no concerns related to ARD.

Table 5.2. Meadowbank Site Geochemical ARD determination 2014-2018

Year	PAG (%)	Uncertain (%)	NPAG (%)
Portage			
2014	NA	NA	NA
2015	NA	NA	NA
2016	34	9	57
2017	17	6	77
2018	44	6	50
Vault			
2014	4	12	85
2015	8	10	82
2016	8	11	81
2017	9	15	76
2018	10	15	76

NA – Calculation of percentage classification not completed in 2014 and 2015.

The water seepage from the Vault RSF area is expected to be of suitable quality to allow discharge to the environment without treatment and capping of this facility is therefore not proposed. Agnico initiated water quality monitoring at Vault in 2014 and results to date confirm the prediction. An adaptive management plan will include continued monitoring of water quality during operations to confirm modelling predictions, and to allow adjustments to the closure plan as required.

As discussed in Section 8.5.3.1.13, in 2018, ponded water was observed at the base of the VRSF (sampling station ST-24) in June, July and August.. As per NWB Water License, samples were collected to assess water quality and the results are presented in Table 8.27 (Appendix 1). No water was pumped from this location as it is mainly a ponding area without flow and the water is evaporating. From the analysis results for ST-24, available in Table 8.27 (Appendix 1) of the 2018 Annual Report, there is no indication of acid rock drainage from the Vault RSF.

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 Section 5.2.1 of this report.

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

Unless there are significant changes during reclamation, quarry surface water sampling will not be completed in the future as follow-up water sampling has not provided evidence of geochemical issues in the quarries. As in the past, Quarry 4 and 14 are flooded, as noted in the 2018 Annual Geotechnical Inspection (Appendix B1). The water ponding at freshet or during the summer period in the quarries does not drain to any nearby watercourse. During previous summer periods, no mitigation was deemed necessary in Quarry 4 and 14 and in any other quarry along the AWAR as no significant amounts of water were observed in the quarries. During winter, the snow could be removed from the quarries to minimize water runoff at freshet. Slope remediation is in progress in some quarries but none of them were totally reclaimed. Agnico is currently evaluating which quarries can be progressively closed. The quarry reclamation along the AWAR will form part of the Meadowbank Final Closure Plan. Reclamation activities for some quarries may occur during operations. The remaining reclamation activities for the quarries will occur during the closure period.

Given the stability of the structures and the monitoring results of 2011 to 2018, it was recommended that unless turbidity issues were visually observed, surface water chemistry sampling should not be conducted at fish bearing watercourses. When an erosional issue occurs, it was recommended that detailed monitoring should be conducted and at a minimum, a single water chemistry sample upstream and downstream of the source. If deemed necessary, additional follow-up sampling or monitoring should be conducted and if necessary additional mitigation will be undertaken.

Beginning of June 2018, small streams began flowing and by mid-June all of the streams and rivers along the road opened up, following the normal freshet transition. Six (6) formal erosion inspections were completed by qualified environment technicians on June 5th, June 8th, June 29th, July 6th, July 27th, and weekly visual inspections were made during AWAR inspections. Agnico also conducted daily inspections in collaboration with the Meadowbank Energy and Infrastructures Department (in charge of the road and travel the road daily for ongoing maintenance). No turbidity issues were visually observed so surface water quality sampling was not deemed necessary at non-HADD crossings or quarry contact water pools. As the road is made of NPAG material, and has no sign of erosion or turbidity, Agnico considers the planned monitoring approach sufficient. As describe in the 2012 Annual Report, ‘HADD crossings R02, R06, R09 and R15 water quality monitoring results continue to suggest an improvement from post AWAR construction (complete March 2008) as mine related road activity did not cause any observable effects on the receiving environment from the field observations and water chemistry data collected in 2012.

Consistent with 2011, the AWAR surface water quality results did not present concerns to the receiving environment as none of the parameters exceeded CCME (2007) in 2012. Based on the monitoring results, the road construction material appears to be stable; therefore Agnico did not conduct any surface water chemistry sampling in 2013 unless visual turbidity observed. If in the future, an erosion issue occurs, detailed monitoring will be conducted in response to the event.

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

No leaching was observed on the pit slope or dike faces in 2018.

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

In 2018, Agnico conducts inspections around the Rock Storage Facilities (RSF) to determine if there is seepage at the base of the RSF. In 2018, as in previous year, seepage has been observed. Samples are taken in accordance with the NWB Water License 2AM-MEA1526 and reported in the annual report – ST-16 for the ponding water at the base of Portage RSF (Section 8.5.3.1.7).

The waste rock storage facility at Portage includes a sector including only NPAG material, and a sector for PAG material, capped with NPAG material during operations. Inspection and monitoring around the Portage waste rock storage facility report very minimal water accumulation around the facility, mostly related to melt and runoff water in the spring. Thermistors installed in the Portage RSF also indicate that freeze back is occurring within the rock pile; freeze back of the pile and the 4.0 m layer of NPAG rock will provide geochemical stability and to act as a thermal barrier to control acid rock drainage potential. The station ST-16 collects some water accumulating along the Portage RSF. It is important to be noted that the seepage reported at ST-16 in 2013 is not related with acid rock drainage from the waste rock contained in the Portage RSF, but rather from infiltration of reclaim water from the TSF through the RSF. Several mitigation measures were implemented in since 2013 to control effectively this seepage.

In 2014, as per inspections conducted within the framework of the Freshet Action Plan, run off was noted at the northeast side of the Portage NPAG waste rock extension pile in a natural depression (WEP). Agnico contained this run off and pumped it back to the North Cell TSF as a precaution and to prevent egress to the East Diversion non-contact water ditch. Sampling has commenced in 2016 at sumps WEP1 and WEP2 as per NWB Water License 2AM-MEA1526. There are no applicable license limits. Results are presented in Table 8.29 for WEP1 and Table 8.30 for WEP 2 (Appendix 1), and discussed in Section 8.5.3.1.15. Refer to Section 8.5.3.1.7 regarding the seepage event; mitigation and monitoring that occurred in NP2 Lake and other downstream lakes (i.e. NP1, Dogleg, and SPL).

The waste rock mined at Vault is largely NPAG. As a mitigative measure any PAG or uncertain waste rock material is placed in the middle of the Vault Waste Rock Storage Facility while NPAG material is placed on the perimeter to encapsulate the PAG material. Runoff or seepage water monitoring analysis confirms to date the effectiveness of this abatement measure. To date water monitoring analysis from run off indicates no concerns related to ARD. The water seepage from the Vault RSF area is expected to be of suitable quality to allow discharge to the environment without treatment and capping of this facility is therefore not proposed. Agnico initiated water quality monitoring at Vault in 2014 and results to date confirm the prediction. An adaptive management plan will include continued monitoring of water quality during operations to confirm modelling predictions, and to allow adjustments to the closure plan as required. As discussed in Section 8.5.3.1.13, in 2018, ponded water was observed at the base of the

VRSF (sampling station ST-24) and was sampled in June, July and August. As per NWB Water License, samples were collected to assess water quality and the results are presented in Table 8.27 (Appendix 1). No water was pumped from this location as it is mainly a ponding area without flow, and the water is evaporating. From the analysis results for ST- 24, there is no indication of acid rock drainage from the Vault RSF.

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;

Agnico takes throughout the year quarterly samples of tailings that are sent to an accredited laboratory to analyse for ABA and Metal Leaching. Table 5.3 below presents the results. The results indicate that the tailings are PAG but have low metal leaching potential. These sample results are also integrated in the Water Quality Forecast updated yearly. Tailings samples analyses were also integrated in the design of the TSF cover for closure.

Table 5.3. Meadowbank 2018 Tailings Monitoring

Analysis	Date Units	4-Feb-18	11-Jun-18	9-Jul-18	9-Oct-18
NP	t $CaCO_3$/1000 t	69	60	45	63
AP	t $CaCO_3$/1000 t	70.9	84.4	65.9	52.2
Net NP	t $CaCO_3$/1000 t	-2.24	-24.3	-20.94	10.8
NP/AP	ratio	0.97	0.71	0.68	1.21
Sulphur	%	2.18	2.82	2.12	1.89
Acid Leachable SO4-S	%	<0.2	0.12	<0.2	0.22
Sulphide	%	2.27	2.7	2.11	1.67
C	%	0.9	0.773	0.602	0.828
CO_3	%	3.30	2.59	1.83	2.31
Final pH	units	1.54	1.75	1.57	1.79
As	mg/L	0.036	0.094	0.014	0.67
Cu	mg/L	0.077	0.018	0.065	0.18
Ni	mg/L	0.033	0.071	0.058	0.047
Zn	mg/L	0.076	0.079	0.08	0.099

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

See Section 5.1.1c above.

5.1.2 Whale Tail Site

As required by NIRB Project Certificate No.008, Condition 8: ***The Plan should be submitted to the NIRB at least 30 days prior to the start of construction, with subsequent updates or revisions to the Plan submitted***

annually thereafter or as may otherwise be required by the NIRB for the life of the Project. The Proponent shall submit a detailed Acid Rock Drainage and Metal Leaching Management Plan that includes the following items:

- ***Waste rock segregation and testing;***
- ***Thermal monitoring of waste rock;***
- ***Seepage management and monitoring;***
- ***A schedule for reporting of results and periodic updating of predictions for the WRSF pond quality;***
- ***Planning for optimal cover conditions;***
- ***Contingency measures that may be implemented if required;***
- ***Plans for comparing monitoring results from receiving waters to model predictions; and***
- ***The identification of thresholds that will trigger management actions if trends analysis indicates water quality objectives may be exceeded.***

And

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 7: ***Geochemical monitoring results including:***

The first version of the Operational ADR-ML Sampling Testing and Plan was submitted on June 2016. Subsequent versions have been emitted to include commitment of the NIRB Project Certificate no. 008 Condition 8 as well as recommendations from CIRNAC and ECCC. Version 4 (March 2019) included an comprehensive update of the plan and is resubmitted as part of the 2018 Annual Report.

This document presents the Operational ARD-ML Sampling and Testing, with the exception of thermal monitoring of waste rock, which is covered in the Thermal Monitoring Plan (Version 2, March 2019). The objectives of the Plan are to define the sampling, analysis, and testing procedures that are to be implemented to define the acid generating and metal leaching potential of waste rock for the Project. This characterization is to be used by mine staff to ensure that waste rock, overburden (till), and lake sediments are identified, managed, segregated and disposed of in an environmentally appropriate manner, as designated in the Plan. The Plan will also define if the waste rock, the overburden, and the lake sediment can be used as construction/closure material.

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

In 2018, Agnico sampled blast holes and analyzed 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. For detailed process regarding the ARD-ML for Whale Tail waste rock and overburden classification, please refer to the Operational ARD-ML Sampling Testing Plan Section 3.2 (Appendix 51). The plan also described the frequency of sampling. Once characterized by the geology team, the waste rock material is segregated and placed in appropriate location.

In 2018, Agnico analyzed 4,397 samples from blast hole at Whale Tail site and in some quarries along the Whale Tail Haul Road at his on-site laboratory. Of this sample, 28 % are PAG, 11 % are uncertain and 61 % are NPAG.

The mine geology staff uses the derived NPR to characterize the rock in the blast pattern. Mine surveyors use 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. See Section 5.2.2 and Table 5.5 for a discussion of the use and location of waste rock.

The Whale Tail WRSF will be constructed to encapsulate potentially acid generating (PAG) and ML waste rock inside a layer of NPAG material as a control measure for ARD and ML. The NPAG rock that is placed on the top and sides of the storage pile is needed in the long term to host the thawed layer and prevent liquids from contacting the centre of the pile that contains PAG and ML waste rock. Presently it is anticipated that the cover design will be similar to the Meadowbank Portage WRSF. The cover will consist of a 4.7 m thick NPAG/NML waste rock layer on the top and edges of the facility. The cover is expected to maintain freezing conditions in the pile in the long-term. This rationale is based on results to date on thermal modelling that considers thermistor readings at the Portage waste rock pile. Rock oxidation can still occur in frozen material but will proceed at a slower rate than predicted by laboratory testing because of the cold temperature prevalent for much of the year. Permafrost will retain water as ice, so it was predicted that contaminants will not be transported away from the core of the WRSF in the long-term. Further information of the Whale Tail WRSF are provided in the Whale Tail Pit – Waste Rock Management Plan (Appendix 51).

Sampling and testing of waste materials for ARD and ML will be conducted during mine operation in order to segregate suitable waste for use in construction and for closure from that which will report directly to the Whale Tail WRSF.

The geochemical properties of all Meadowbank mining wastes will be confirmed in 2019 with duplicates samples sent to certified laboratory, through both static and kinetic testing on numerous representative samples, by various test methods and through multiple project development stages. This practice has been ongoing since the beginning of the mining operations at Meadowbank.

The results of the 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 upon request.

If ponding water is found at the at the base of the WRSF, as per NWB Water License, samples will be collected to assess water quality and water discharged to the Whale Tail Attenuation Pond. In 2018, no water was pumped from this location as there were not enough water to allow pumping. An adaptive management plan will include continued monitoring of water quality during operations to confirm modelling predictions, and to allow adjustments to the closure plan as required.

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

Refer to the Section 5.2.2 of this report.

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

There is no issues to report for 2018. There were no runoff from any quarries along the Whale Tail Haul Road in 2018. Refer to the 2018 Annual Geotechnical Inspection (Appendix 7) for more details.

Pre-freshet and freshet inspections were conducted at crossings along the Whale Tail Haul Road, eskers and quarries in 2018. These inspections are conducted to document the presence/absence of flow, erosional concerns and turbidity plumes and to ensure that runoff, if any, would be free of any contaminant and would not impact the environment. A freshet leader was hired in 2018 and was only dedicated to the inspection of Whale Tail Haul Road including the esker, quarries, culvert and bridges.

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

Nothing to report for 2018.

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

Nothing to report for 2018.

5.2 WASTE ROCK AND ORE VOLUME

5.2.1 Meadowbank Site

In accordance with NWB Water License 2AM-MEA1528 Schedule B, Item 8: *Volumes of waste rock used in construction and placed in the Rock Storage Facilities.*

The total volume of waste rock generated by Portage and Vault pits in 2018 was 12,597,454 tonnes. There is not more mining in Goose Pit so no more waste rock generated in 2018. The use and location of all of the rock, by volume, is presented in Table 5.4 and is identified by the following categories:

- Tailings Dams and dikes– used for the construction of dams or dikes adjacent to the tailings pond;
- Other Construction;
    - Roads – used for road construction and maintenance;
    - Crushers – taken to the mobile crusher and used for construction or maintenance purposes;
    - Miscellaneous uses;
    - Tailings cover construction
- Rock Storage Facility – taken to the rock storage facilities.

The Mine Waste Rock and Tailings Management Plan was revised in March 2019 and can be found in Appendix 17. Details of all waste rock deposition and tailings management are contained in the revised Plan.

Table 5.4. 2018 Meadowbank Rock volumes

Month	Portage Pit & Vault Pit (tonnes)								Ore Processed in Mill (tonnes)
	Ore	Waste Rock							
		Dikes	Roads	Crushers	WRSF	Stockpiles	Other	Total	
January	298,411	308	8,958	1,292	1,286,572	378	41,538	1,637,457	290,277
February	236,865	0	83,624	27,237	1,199,432	251	149,036	1,696,445	288,375
March	256,063	675	5,961	22,917	1,310,619	1,446	165,562	1,763,243	246,416
April	225,990	56,338	440	101,881	1,228,920	86,609	229,113	1,929,291	254,528
May	230,283	0	50,282	0	1,198,847	13,831	150,173	1,643,416	301,915
June	222,227	0	3,360	0	929,405	1,112	119,259	1,275,363	287,319
July	190,331	0	2,918	0	681,804	3,196	166,296	1,044,545	347,236
August	179,509	0	7,002	0	606,678	661	49,324	843,174	303,191
September	210,884	0	3,482	0	609,036	12,180	126,692	962,274	237,935
October	174,656	0	2,510	0	494,411	272	118,340	790,189	239,674
November	194,071	0	1,768	0	532,824	336	119,821	848,820	215,299
December	204,293	0	1,066	0	508,417	3,392	69,652	786,820	244,500
TOTAL	**2,623,583**	**57,321**	**171,371**	**153,327**	**10,586,965**	**123,664**	**1,504,806**	**15,221,037**	**3,256,665**

5.2.2 Whale Tail Site

5.2.2.1 Waste and Ore Stockpile Volume

In accordance with NWB Water License 2AM-WTP1826 Schedule B, Item 8: *Volumes of Waste Rock used in construction and placed in the Waste Rock Storage Facility.*

And

In accordance with NWB Water License 2AM-WTP1826 Schedule B, Item 9: *Volumes of ore stockpiled and overburden stored at Whale Tail Pit site.*

The total volume of waste rock generated by Whale Tail Pit in 2018 was 4,731,779 tonnes. The use and location of all of the rock, by volume, is presented in Table 5.5 and is identified by the following categories:

- Tailings Dams and dikes– used for the construction of dams or dikes adjacent to the tailings pond;
- Other Construction;
    - Roads – used for road construction and maintenance;

- Crushers – taken to the mobile crusher and used for construction or maintenance purposes;
- Miscellaneous uses;
- Tailings cover construction

- Rock Storage Facility – taken to the rock storage facilities.

The Whale Tail Waste Management Plan was revised in October 2018 and can be found in Appendix 51. Details of all waste rock deposition and tailings management are contained in the Plan.

Table 5.5. 2018 Whale Tail Rock Volumes

	Whale Tail Pit (tonnes)									Ore Processed in Mill (tonnes)
	Ore	Waste Rock								
		Dikes	Roads[1]	Crushers	WRSF[2]	Landfill	Stockpiles	Construction[3]	Total	
January	0	0	13,311	0	121,278	0	0	33,258	167,847	0
February	0	0	2,349	0	131,283	0	0	36,072	169,704	0
March	0	0	88,479	0	112,926	0	0	45,181	246,586	0
April	0	0	4,002	0	137,547	0	0	118,048	259,597	0
May	0	0	19,401	0	84,912	0	0	196,308	300,621	0
June	0	0	31,407	137,240	128,910	0	0	116,230	413,787	0
July	0	6,612	43,625	78,915	199,270	0	0	194,221	522,643	0
August	0	108,524	6,494	65,872	178,681	0	0	151,375	510,946	0
September	0	0	0	0	64,105	0	0	281,443	345,548	0
October	0	0	522	0	421,706	0	0	163,711	585,939	0
November	11,084	0	941	25,573	481,240	0	0	0	518,838	0
December	35,065	0	10,970	45,527	598,161	0	0	0	689,723	0
TOTAL	**46,149**	**115,136**	**221,501**	**353,127**	**2,660,019**	**0**	**0**	**1,335,847**	**4,731,779**	**0**

1. Include road construction and maintenance; excludes Whale Tail Haul Hauling Road
2. Includes the waste rock that is stored in temporary locations
3. Earthworks excluding road and Dike construction

5.2.2.2 Monitoring program

In accordance with NIRB Project Certificate No.008 Condition 7: ***Prior to commencement of mining of the Whale Tail deposit, and in consultation with applicable regulatory agencies, including Natural Resources Canada, the Proponent shall as part of a Mine Waste Rock and Tailings Management Plan that reflects site-specific geological and geochemical conditions. The Plan should be submitted to the NIRB at least 60 days prior to the start of construction of the Waste Rock Storage Facility, with subsequent updates or revisions to the Plan submitted annually thereafter or as may otherwise be required by the NIRB for the life of the Project.***

a) Develop and implement monitoring programs for the Tailings Storage Facility and the Waste Rock Storage Facility at the Whale Tail Pit;

b) Establish thresholds that will trigger the requirement for the Proponent to implement adaptive management strategies to minimize the potential for impacts from these Facilities; and

c) Identify the adaptive management strategies that will be used by the Proponent to minimize the potential for impacts from these Facilities.

The Whale Tail Pit – Waste Rock Management Plan was initially submitted in January 2017 (Version 1) with subsequent update. The last version 4 (October 2018) (Appendix 51) was updated to align with recommendation issued by CIRNAC and ECCC in October 2018. This plan was approved by NWB. Agnico will continue to update the plan on an annual basis once the operation phase of the Whale Tail Project begin.

5.2.2.3 Site-specific geotechnical investigations

In accordance with NIRB Project Certificate No.008 Condition 9: ***The Proponent shall undertake the additional site-specific geotechnical investigations required to identify sensitive land features and to inform final engineering design prior to the construction of project components such as the waste rock storage facility and quarries. Results from these studies should be submitted to the NIRB at least 30 days prior to the start of construction of these facilities, with results or updates submitted annually thereafter as applicable.***

Agnico have submitted to NIRB on June 4th, 2018 the memorandum Site Specific Geotechnical Studies (Appendix 18) as required by Condition 9. Please refer to the document in Appendix for a complete overview of the investigation completed. The below is a summary of the memorandum Site Specific Geotechnical Studies.

Since 2015, many field investigations have been carried out at the Whale Tail Pit Project in order to characterize the field conditions (types of soils encountered, overburden thicknesses, rock quality, etc.). This memorandum outlines the geotechnical studies conducted at four (4) specific locations:

- WRSF and WRSF Dike,
- Quarry;
- Mammoth Dike;
- Whale Tail Dike.

Field investigation campaigns have been carried out at the WRSF and quarry areas between 2014 and 2016. The information available as of May 2018 indicates that the bedrock depth varies from 7.2 m within the footprint of the WRSF – Phase 1 area (2.7 m within the footprint of the WRSF Dike), 5.1 m in the Mammoth Dike area and 4.9 m in the quarry area, in average. No further geotechnical data are available in these areas, hence no major sensitive land features have been identified at these locations. The design report of the Whale Tail Dike (WTD) contains all the required information on the field investigations carried out at the WTD, and should be referred to for all the implications of geotechnical investigations for construction.

5.2.3 Exploration Whale Tail Site

In accordance with NWB Water License 2BB-MEA1828 Part B, Item 6c: *An estimate of the current volume of waste rock and ore stockpiled on site.*

Refer to Section 5.2.2 above.

5.3 TAILINGS STORAGE FACILITY MEADOWBANK SITE

5.3.1 Tailings Storage Facility Capacity*

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 9: *An update on the remaining capacity of the Tailings Storage Facility.*

And

As required by NIRB Project Certificate No.004, Condition 18: *commit to a pro-active tailings management strategy through active monitoring, inspection, and mitigation. The tailings management strategy will include the review and evaluation of any future changes to the rate of global warming, compliance with regulatory changes, and the ongoing review and evaluation of relevant technology developments, and will respond to studies conducted during the mine operation.*

From 2010 to 2018, a total of 31.7 Mt of dry tailings slurry from the mill had been deposited in the TSF's as indicated in Table 5.6. In 2018, a total of 5.8 Mt of tailings slurry was deposited in the tailings storage facilities, representing a 3.2Mt dry tonnes. A monthly summary of the tailings produced in 2018 is provided in Table 5.7.

Agnico revised the tailings deposition plan (available in Updated Mine Waste Rock and Tailing Management Plan 2018 presented in Appendix 17), to comply with the new LOM produced. The deposition model completed is valid until the end of the mining operation in Q4 2021. Starting in July 2019, the tailings stored within the Meadowbank TSF are forecasted to originate from the Whale Tail Pit. The model is based on the data collected during previous years of operation. The filling scheme for the two cells of the tailings storage facility is designed for end of pipe discharge.

Table 5.8 presents the summary of the tailings management strategy in 2019-2021. Additional infrastructure constructions will be required to increase the tailings capacity. More information on the tailings deposition modeling is presented in the Waste Management Plan.

The main conclusions from the modeling results are:

- The total estimated residual capacity of the TSF North Cell (structures at El.150masl and 154masl) and South Cell (structures at El.150m), based on tailings dry density is 9.6 Mt;
- The total capacity of the North Cell is estimated at: 3.8 Mt;
- The total capacity of the South Cell is estimated at: 5.8 Mt;

* TSF- Tailings Storage Facility

- The LOM mill throughput is 9.6 Mt, indicating there is sufficient capacity in the approved TSF.

The original design for the South Cell and North Cell allows respectively for a final elevation of the structures at elevation 150m and 154m which will be required to provide sufficient capacity for tailings deposition.

Agnico is evaluating changing the tailings deposition technology to integrate best available disposal technology. One such technology is in-pit deposition, which was developed to a detailed engineering level, and is currently in amendment process. Refer to Section 11.2.1 for more details regarding the permitting process.

Table 5.6. Meadowbank Deposition location (realized)

Date	Deposition location	Tailings deposited (dried tons)
February 2010 to November 2014	North Cell	16.0M tons
November 2014 to July 2015	South Cell	2.7M tons
July 2015 to October 2015	North Cell	1.0M tons
October 2015 to August 2018	South Cell	10.8M tons
August 2018 to October 2018	North Cell	0.5M tons
October 2018 to December 2018	South Cell	0.7M tons

Table 5.7 Meadowbank 2018 Processed Tailings Volume and Associated Properties

	Total Tailings Slurry (tonnes)	Density of Tailings (% solid)	Density of Slurry (tonnes / m^3)	Tailings Placed in TSF (m^3)
January	500,787	59.0%	1.612	310,708
February	522,314	55.2%	1.566	333,600
March	428,691	57.5%	1.596	268,679
April	441,143	57.7%	1.591	277,343
May	516,754	58.4%	1.615	320,050
June	501,379	57.3%	1.593	314,670
July	616,890	56.3%	1.592	387,433
August	602,007	50.4%	1.495	402,744
September	466,772	51.0%	1.507	309,715
October	410,910	58.3%	1.620	253,595
November	366,738	58.7%	1.645	222,967
December	414,542	59.2%	1.653	250,774
TOTAL	**5,788,926**	**56.4%**		**3,652,278**

Table 5.8. Meadowbank Deposition plan and infrastructure construction – summary

Date	Operational Cell	Dry tonnes deposited	Infrastructure construction
January to April 2019	South Cell	0.9M tons	• February 2019: South Cell permeable berm to secure reclaim pond
May 2019 to June 2020	North Cell	3.8M tons	• April 2019: 1st NC permeable berm to secure NC pond • August 2019: NC permeable berm to secure NC pond • August 2019: NC reclaim road raise to 154m • July to October 2019: Progressive NCIS raise to 154m in the west extents • September 2019: 2nd NC permeable berm to direct water ponding • Q1 2020: 3nd NC permeable berm to direct water ponding • Q 2020: Center access for additional deposition point deposition
July 2020 to January 2021	South Cell	4.9 M tons	• Q3 2020: Saddle Dam 3, 4 and 5, and Central Dike raise to 150m masl • Q4 2021: Center access for additional deposition point deposition

5.3.2 Tailings in-Pit Disposal Meadowbank Site*

As required by NIRB Project Certificate No.008, Condition 87: ***The Proponent shall, prior to the deposition of tailings into the Portage or Goose Pits, file with the Nunavut Water Board (NWB) a report containing updated hydrogeological modelling addressing information gaps as per the NIRB recommendation in the Reconsideration Report and Recommendations to the satisfaction of the NWB. The Proponent shall not deposit tailings into the Portage or Goose pits until the Water Board is satisfied that the modelling addresses the specific information gaps, and that the proponent can manage any identified risks with existing designs and feasible management strategies. The Proponent shall file a report with the Nunavut Water Board, containing updated hydrogeological modelling addressing information gaps, prior to the deposition of tailings into the Portage or Goose pits. Confirmation of the report's filing, conclusions of this report, and any further updates to reporting requirements as determined under the water licence, shall be provided to the NIRB in Agnico Eagle's Annual Report for the project.***

And

As required by NIRB Project Certificate No.004, Condition 20: ***Prior to construction, Cumberland shall identify mitigation measures that can be taken if groundwater monitoring around the tailings facility demonstrates that contamination from tailings has occurred through the fault. Upon drawdown of the North arm of Second Portage Lake, Cumberland shall conduct further tests to assess the permeability of any faults and***

* TSF- Tailings Storage Facility

provide the results to regulators. If doubt remains Cumberland shall seal the fault and conduct further permeability testing and monitoring. Following completion of the permitting process for the In-Pit Tailings Modification Proposal, the Proponent shall provide an update to the NIRB on any fault identified related to either Portage Pit A, Portage Pit E, and Goose Pit, any plans to address groundwater movement considering any fault, and how potential monitoring of tailings and groundwater movement would be undertaken to inform management plans.

Thermal modeling was carried out in early 2018 for the in-pit tailings deposition detailed engineering study at the Goose Pit, Portage Pit A and Portage Pit E up to a 100-year period after closure. The modeling details and results were presented in the "In Pit Tailings Deposition Thermal Modeling Report", dated April 16th, 2018 (Appendix 19). To address NRCan's outstanding comments from the meeting on September 25th, 2018, additional long term thermal modeling beyond 100 years and up to 20,000 years after closure was carried out to evaluate the long term thermal regime/permafrost conditions for the three pits. Modeling summary of this work is presented in the report 'Meadowbank In-Pit Tailings Disposal - Thermal and Hydrogeological Modeling Update to Address NRCan's Comments' and can be found in Appendix 20.

It is Agnico intents to comply with NIRB Project Certificate 004 Condition 20 once the permitting phase with NWB is completed. For now, the Groundwater Management Plan is considered to be compliant with the term and condition.

5.4 FREEZEBACK, PERMAFROST, THERMAL MONITORING AND CAPPING THICKNESS

5.4.1 Meadowbank Site

As required by NIRB Project Certificate No.004, Condition 19: ***Provide for a minimum of two (2) metres cover of tailings at closure, and shall install thermistor cables, temperature loggers, and core sampling technology as required to monitor tailing freezeback efficiency. Report to NIRB's Monitoring Officer for the annual reporting of freezeback effectiveness.***

And

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 18: ***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.***

The final landform of the TSF at closure will include a cover system comprised of a minimum 2 m thick layer of NAG rockfill. Since 2015, progressive capping has been ongoing in the TSF North Cell. Thermistors monitoring is also ongoing in the tailings of the North Cell and show freezeback of the tailings with the presence of an active layer at surface. The capping installed is not representative of the cover system that will be achieved once the final landform is achieved. There is also not enough thermistor installed in the cover system to be able to assess the freezeback efficiency of the capping. Once closure of the TSF is completed additional thermistors will be installed and the freezeback efficiency will be assessed. Refer to the Waste Rock and Tailings Management Plan (Appendix 17) for more information.

Update on Field Trial

A research project in collaboration with the Research Institute of Mines and Environment (RIME) was initiated in 2014 at Meadowbank. The Research Institute on Mines and Environment, through the NSERC-UQAT Chair on Mine Site Reclamation, is mandated to evaluate the performance of three field experimental cells constructed in 2014 and 2015 on Meadowbank's North Cell TSF. The three experimental cells that were built on Meadowbank's TSF are two insulation covers and one thermal cover with capillary barrier effects (CCBE).

The tested experimental cells are a 2m and a 4m thick insulation cover as well as a 2m thick cover with capillary barrier effects. The cells were built with coarse and fine non-potentially acid generating (NAG) ultramafic waste rock (soapstone) and are instrumented in order to follow their thermal and hydrogeological behaviors.

Also in collaboration with the RIME, in 2016 a laboratory testing program was developed to obtain a good overview of the effects of freeze/thaw (F/T) and wet/dry (W/D) cycles on the soapstone. The developed experimental program is primarily focused towards the evaluation of the resistance to F/T and W/D of the soapstone to be used as cover materials for the TSF and RSF. Testing was completed to evaluate the effects of F/T and W/D on rock cores and rock slabs, the effects of F/T on various soapstone grain size fractions, and the effects of F/T on the permeability of a compacted soapstone layer.

In 2018 the RIME continued collecting and analysing the data on the cover field trial and on the long term performance of ultramafic rockfill as a cover material. Study are ongoing and no additional data are available to be shared at the moment. Publications are expected to be available in 2019.

Thermistor are installed within the tailings of the TSF and the waste rock of the Portage RSF. These instruments are used to obtain thermal data within the operation of these structures. Additional instruments will be installed at closure. It is also planned to update the thermal modelling in the coming year based on the updated information available. The results of the updated thermal modelling will be compared to the results of the instruments monitoring to assess that the cover will perform as per design intent.

The thermistor installed within the tailings of the North Cell indicate that tailings freezeback is occurring as most of the tailings are frozen except for a seasonal active layer. Thermistors installed within the Portage RSF indicate that freezeback is occurring within the Portage RSF structures. The instruments shows that the active layer is variable in thickness based on the thermistors location. A mandate is currently ongoing for the Whale Tail WRSF to calibrate the thermal model and develop an instrumentation plan to assess the cover performance. Once this mandate is over, a similar approach will be used at Vault and Portage RSF to obtain information to assess the performance of the Portage cover and inform on the required update to the waste management plan. This mandate is expected to be initiated in 2019.

Tailings Storage Facility (TSF) and Rock Storage Facility (RSF)

This section presents the analysis obtained from the thermal monitoring of the tailings in the TSF and the waste rock in the RSF. Figure 13. and Figure 14. Meadowbank14 show the location of thermistors located in the TSF and RSF. Appendix C of the Waster Rock and Tailings Management Plan (Appendix 17) also list all the thermistors installed within the tailings of the TSF and the waste rock of the RSF.

The thermal profiles show freeze back progress of the tailings and waste rock storage facilities. In general, tailings and waste rock demonstrate frozen conditions with an active layer at the surface subjects to freeze and thaw process. Depending on the cover (tailings or rockfill), the active layer varies due to different thermal process. Further analysis is required to complete the TSF and RSF final closure design.

Additional thermistors were installed in 2018 to monitor the tailings thermal profile:

- Thermistors (NCIS-T1, NCIS-T2, NCIS-T3 and NCIS-T4) were installed in August 2018 in the upstream crest of the North Cell Internal Structure (NCIS). The thermistors are located in the tailings below the rockfill structure.

Appendix 21 presented the thermal monitoring results for instruments located in the TSF and RSF. The instruments installed in the tailings of the TSF and waste rock of the RSF to monitor freezeback are the following:

- Tailings Storage Facility
    - Instruments installed in the tailings of the North Cell (tailings area) (NC-16-01, NC-06-02 & NC-17-01 to NC-17-08, SWD-01). There is generally no waste rock cover in these locations
    - North Cell Internal Structure (NCIS-01 to NCIS-04). These instruments are installed within capping (but not final thickness)
    - Instruments installed within the upstream of the dike and now covered with tailings (SD1-01, SD2-01, SD4-01, CD-US-0+650
- Rock storage facility
    - Instruments installed within the Portage RSF (RSF-3, RSF-5 to RSF-16)

The detailed analysis of the thermal monitoring is presented in the 2018 Annual Geotechnical Inspection report (Appendix 7). The table below present the sections of this report associated with each structure. Agnico will refer the reader to the 2018 Annual Geotechnical Inspection Report for a complete review of the results

Table 5.9. Meadowbank Thermal data interpretation sections in the 2018 Annual Geotechnical Inspection

Structure	Section in the 2018 Annual Geotechnical inspection (Golder, 2018)
Saddle Dam 1	5.6.1
Saddle Dam 2	5.6.2
RF1 & RF2	5.6.3
North Cell tailings	5.6.4
Stormwater Dike	5.7
North Cell Internal Structure	5.8
Central Dike	5.5.1.1
Saddle Dam 3	5.5.2
Saddle Dam 4	5.5.3

Saddle Dam 5	5.5.4

In summary, thermal data shows that :

- The thermistors in the North Cell tailings area show generally that tailings are in frozen condition with an active zone in the tailings generally less than 2 m. Some instruments show temperature above 0º within the tailings(NC-17-2, NC-17-3 and NC-17-8). These instruments are located area where water is ponding in the North Cell show.

- The thermistors in NCIS were installed in 2018 after the construction of this structure. In these area the active zone is entirely confined within the rockfill layer (2 to 4 m thick) and the tailings temperature is less than 0 º.

- Thermistors located on the upstream slope of dams (Saddle Dam 1, 2 & 4) are generally in frozen conditions with an active layer varying between 1.5m to 4m. Many factors impact the active zone thickness measured:

    - the boundary conditions, the thermistors are installed between the rockfill structure and the tailings which have different thermal properties;

    - the thickness over the thermistors can vary as they are installed directly on the upstream slope of the structure (the instruments are in a 3H:1V slope).

- CD-US-0+650 installed on the upstream slope of Central Dike shows temperatures near 0^0 C varying slightly above and below all along the profile. This is mainly explained by the long term deposition that occurred near this location over the last years.

Thermistors installed in the Waste Rock Storage Facility show an active zone varying between generally 3 to 4m and frozen conditions below this active zone. The active zone is thicker than for tailings due to convection and difference in thermal property.

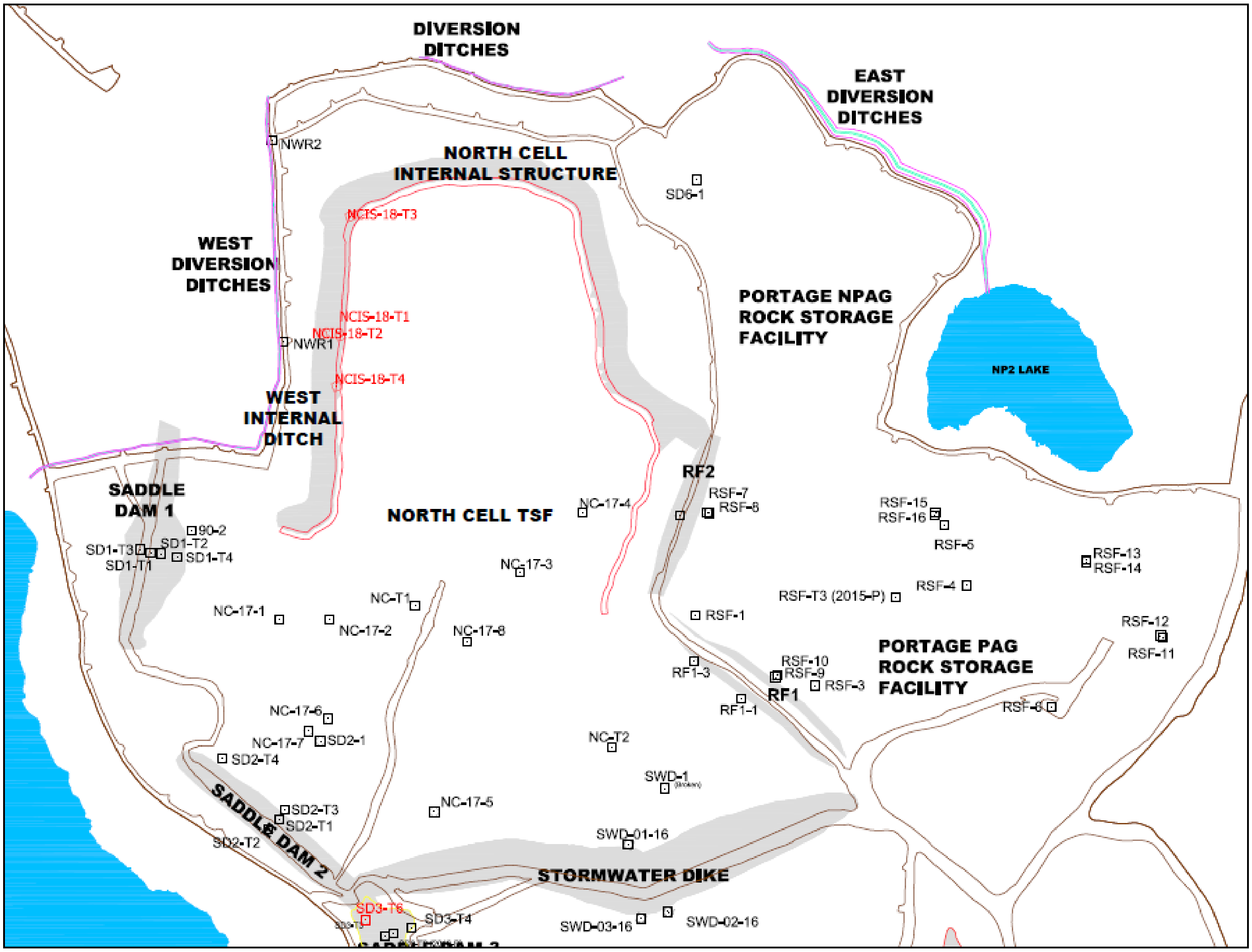


Figure 13. Meadowbank Thermistor Location in Portage RSF and TSF North Cell (red: installed in 2018, black: existing)

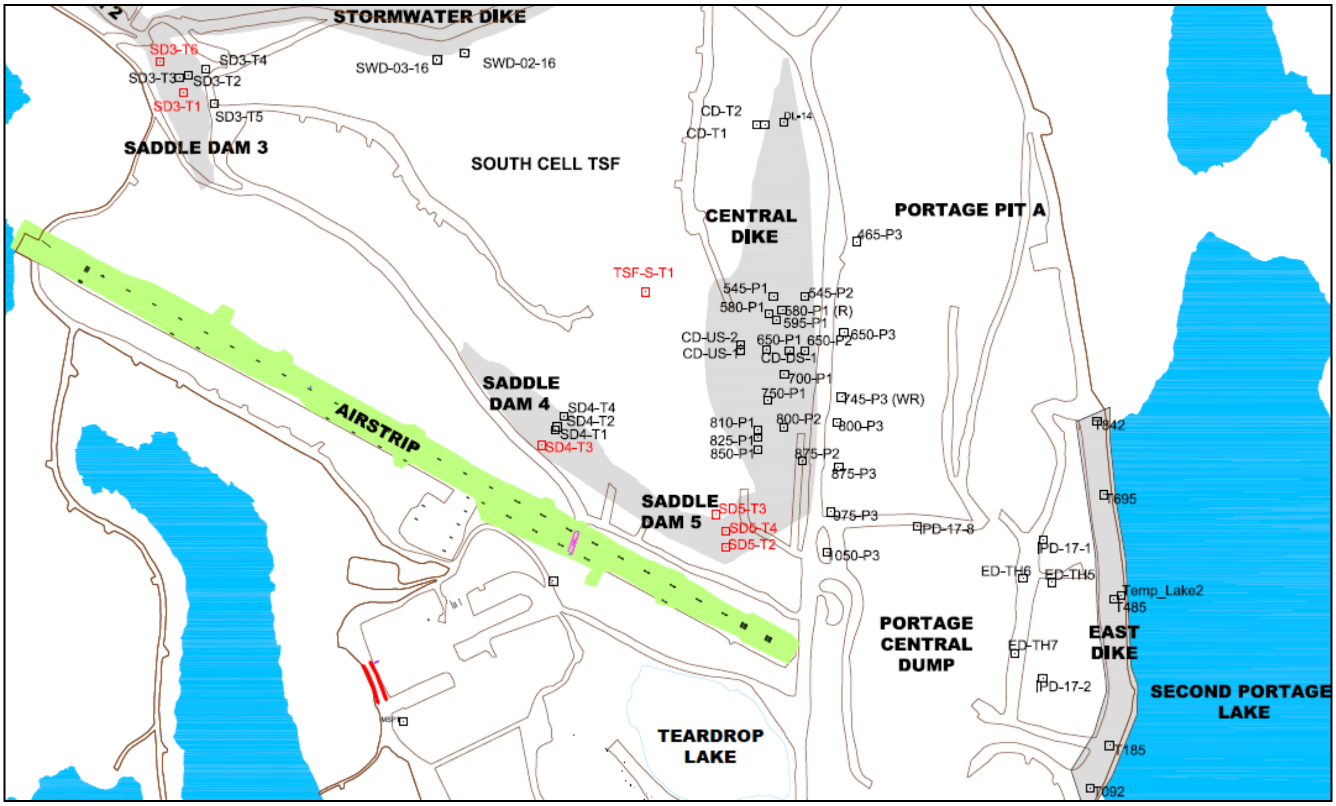


Figure 14. Meadowbank Thermistor Location in TSF South Cell (red: installed in 2018, black: existing)

5.4.2 Whale Tail Site

As required by Water License 2AM-WTP1826 Schedule B, Item 18: ***A summary of on-going field trials to determine effective capping thickness for the Waste Rock Storage Facility for the purpose of long term environmental protection.***

And

As required by NIRB Project Certificate No.008 Condition 10: ***Results of these studies should be submitted to the NIRB at least 30 days prior to the start of construction of these facilities, with subsequent updates submitted annually thereafter. In consultation with applicable regulatory agencies such as Indigenous and Northern Affairs Canada and Natural Resources Canada, the Proponent shall undertake additional site-specific permafrost monitoring, mapping and thermal analysis to:***

- ***Document permafrost conditions, including seasonal thaw and amount of ground ice;***
- ***Inform the detailed design of project infrastructure such as the Whale Tail pit, water management structures, mine site and haul roads, waste rock storage facility, tailings storage facility; and***
- ***Ensure the integrity of such infrastructure is maintained after construction.***

And

As required by NIRB Project Certificate No.008 Condition 14: ***The Proponent shall develop and implement a Thermal Monitoring Plan to identify potential changes in talik distribution and flow paths that may result from the development of project infrastructure, including the Whale Tail pit, dikes, and water impoundments. The Plan should be submitted to the NIRB at least 60 days prior to the start of construction of these facilities, with subsequent updates submitted annually thereafter or as may otherwise be required by the NIRB.***

In 2018, studies were initiated with a consultant to develop the detailed engineering design for the capping of the Whale Tail RSF. This mandate include thermal modelling to re-assess the capping thickness. This information will also be used to inform the instrumentation program to ensure that the WRSF cover perform according to its design intent.

The first version of the Whale Tail Operational ADR-ML Sampling Testing and Plan was submitted on June 2016. Subsequent versions have been emitted to include commitment of the NIRB Project Certificate no. 008 Condition 8 as well as recommendations from CIRNAC and ECCC. Version 4 (March 2019) included an comprehensive update of the plan and is resubmitted as part of the 2018 Annual Report. Agnico Eagle believes we have met the requirements of Condition 10 and submit that sufficient information herein is provided to NIRB to conform to Condition 10.

Agnico Eagle has documented permafrost conditions on site with several thermistors placed at strategic location recommended by the different designers and consultants involved in the project. Appendix A of the Thermal Monitoring Plan (Version 2 – Appendix 51) presented a summary of the thermal monitoring program at Whale Tail Pit Project from the period of 2016 to 2018 along with interpretation of the results.

The data presented in Appendix A of the Thermal Monitoring Plan informed and will continue to inform the detail design of the project infrastructure such as the Whale Tail pit, water management structures, mine site and haul roads, waste rock storage facility and tailings storage facility. Agnico Eagle consider also that the detail report submitted to the Nunavut Water Board as per Licence 2AM-WTP1826 Part D Item 1 and 2 is inclusive of the requirements listed in the Term and Condition 10.

Furthermore, below is a summary of consultations conducted several face-to-face consultation meeting with regulators as listed below:

- July 26, 2018: Agnico Eagle meets with CIRNAC in Ottawa to present the Whale Tail Pit Project Mine Contact Water Modelling Commitments were the result of the Updated Thermal-Hydrogeological Assessments were presented to CIRNAC.

- October 17, 2018: Agnico Eagle meets with CIRNAC and NRCan in Iqaluit to discuss of the Outstanding Issues on the Potential for Post-closure Exceedance of Arsenic in the Flooded Whale Tail Pit, and the Absence of Data to Validate Hydraulic Gradient.

The Nunavut Water Board has approved the detail designed of the Whale Tail Dike, Mammoth Dike, WRSF Dike, North East Dike, Starter WRSF and Pit,. Whale Tail WRSF, NPAG Stockpile and Overburden Stockpile Design Report and Drawings. Agnico Eagle considers that these infrastructures were designed in accordance with the Water Licence, term and condition 10 and the integrity of these infrastructure will be maintained after construction.

Agnico has updated the Whale Tail Thermal Monitoring Plan and is presented in Appendix 51.

SECTION 6. WASTE MANAGEMENT ACTIVITIES

6.1 GENERAL WASTE DISPOSAL ACTIVITY

6.1.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 11: ***A summary report of general waste disposal activities including monthly and annual quantities in cubic metres of waste generated and location of disposal.***

And

NIRB Project Certificate No.004 Commitment 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 incinerator in 2018 is included in Table 6.1. A total of 3,749.4 m^3 were incinerated. More details regarding quantities incinerated can be found in Section 6.2.1.

Table 6.1. 2018 Volume of waste transferred to Meadowbank incinerator

Month	Volume of waste send to incinerator (m^3)
January	298.6
February	276.5
March	221.2
April	331.8
May	342.9
June	276.5
July	342.9
August	331.8
September	331.8
October	331.8
November	320.7
December	342.9
TOTAL	**3,749.4**

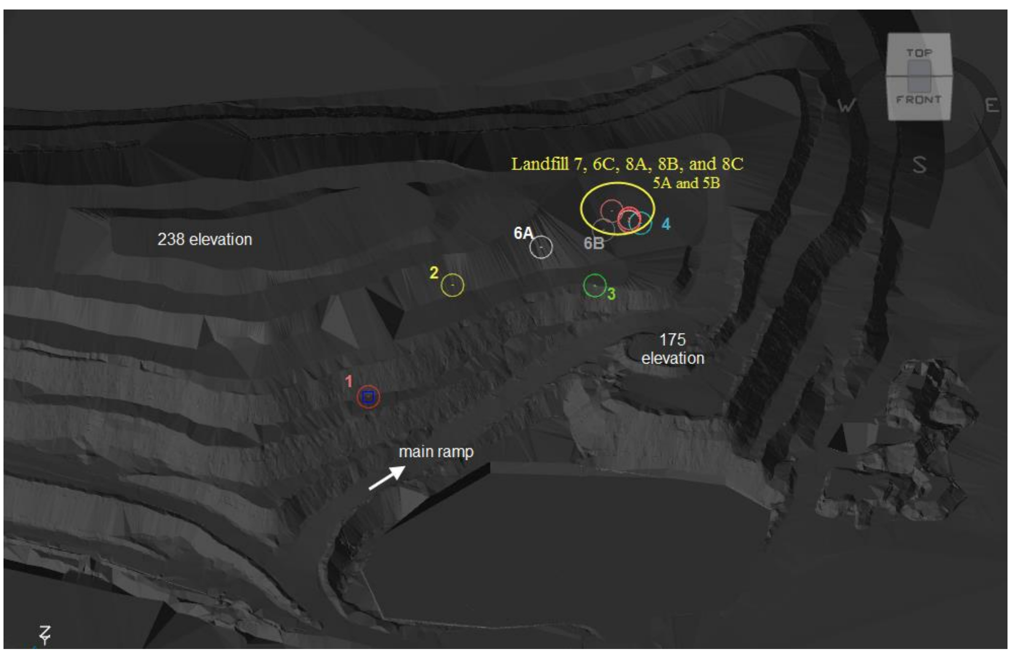
Table 6.2 below indicates the volume of waste in cubic meter (m^3) disposed of in each sub-landfill from 2012 to 2018 and Figure 15 indicates the location of each sub-landfill used to date. The volume of waste landfilled from the start of the project is 68,843 m^3. From that amount, Agnico landfilled 15,819 m^3 between January 27th 2018 and December 31st 2018. In 2018, sub-landfill #8b (November 30, 2017 to January 27, 2018), #8c (January 28, 2018 to October 1, 2018) and #8d (October 1, 2018 to December 31, 2018) were used for waste disposal and have all been covered with NPAG waste rock by the end of December. In 2018, landfill waste were from Meadowbank and Whale Tail Sites (Section 6.1.2 and 6.1.3).

The waste consists primarily of plastics, fiberglass, wood, cardboard, rubber, clothing and some metal that was not recycled.

Table 6.1 Volume of waste disposed in each Meadowbank sub-landfill (from survey)

Landfill	Coordinates (UTM)			Volume (m^3)	Date Covered
	Northing	Easting	Elevation		
#1	7215715.58	638601.45	160	3,650	Dec-12-2012
#2	7215795.79	638711.42	186	840	Feb-27-2013
#3	7215743.12	638827.77	195	1,656	May-14-2013
#4	7215796.48	638890.93	200	9,507	Jan-19-2014
#5A	7206586.10	643115.90	210	3,870	Nov-30-2014
#5B	7206586.10	643115.90	210	2,768	Mar-13-2015
#6A	7215788.80	638793.30	212	278	Mar-21-2015
#6B	7215789.30	638853.10	212	3,260	Sept-05-2015
#6C	7215790.80	638878.10	212	9,290	May-20-2016
#7	7215790.80	638878.10	214	4,560	Dec-20-2016
#8a	7215790.10	638878.10	217	11,700	Nov-30-2017
#8b	7215790.10	638878.40	217	1,645	Jan-27-2018
#8b	7215790.10	638878.40	217	13,019	Oct-1-2018
#8d	7215800.70	638865.40	221	2,800	Dec-31-2018
			TOTAL	**68,843**	

Figure 15. Meadowbank Sub-landfill location



In 2018, a total of 107 sea cans containing hazardous waste were transported to Solva-Rec Environnement Inc., 1 sea can containing plastic pails contaminated by oil and grease was transported to RPM ECO and 2 sea cans of mixed garbage and construction debris were transported to Enfouibec Inc. These companies are all registered disposal facilities located in the Province of Quebec. The total weight was 482.97 tonnes. This amount of sea cans and total weight does not include the scrap metal (1,690 tonne), scrap tires (110 tonnes) and batteries (18.8 tonnes). The sea cans were shipped from the spud barge at Agnico's Baker Lake marshalling facilities to Bécancour, Quebec by sealift. These materials were transported under Waste Manifest #'s PC55877-7 (Appendix 22) in accordance with the GN Guidelines for the shipment of such waste. A description of the types of waste, packaging and volume is provided in Table 6.3. The volume of waste hazardous and non-hazardous waste disposed by sealift in 2018 are for both Meadowbank and Whale Tail Site. As waste to be disposed off-site from Whale Tail Site all transit by Meadowbank during the year, there is no possibility to make any distinction between both site.

Table 6.2 Waste shipped to licensed hazardous waste companies

Description	UN	Class	P. G. [1]	Regulated under T.D.G.A.[2]	Quantity	Container Type and Capacity	Unit Capacity	Volume (L)	Weight (kg)	Disposal Method
Crushed lamps and fluorescent tubes	N/R	N/R	-	no	3	drum	205 L	615	521	Secure landfill
Empty steel drum 205 L, last residue contained: OIL/GREASE	N/R	N/R	-	no	6	drum	205 L	1,230	90	Cleaning and metal recycling
UN 2031, empty plastic drum 205 L, last residue contained: NITRIC ACID	2031	8 (5.1)	II	yes	78	drum	205 L	15,990	821	Cleaning and energy recovery
Empty plastic pail 20 L, last residue contained: OIL AND GREASE	N/R	N/R	-	no	2690	pail	20 L	2,690	2,690	Cleaning and plastic recycling
UN 3082, Environmentally Hazardous substances, liquid, n.o.s. - acidic cleaner	3082	9	III	yes	1	Quatrex	765 L	765	442	Neutralization and secure landfill
UN 3077, Environmentally Hazardous substances, solid, n.o.s.(lead) - lab sample	3077	9	III	yes	20	Quatrex	765 L	15,300	1,714	Solidification and secure landfill
Mixed waste labpack (Labpack of miscellaneous chemicals)	N/R	N/R	-	no	12	Quatrex	765 L	9,180	2,345	Solidification and secure landfill
Hydrocarbon contaminated soils	N/R	N/R	-	no	4	drum	205 L	820	985	Secure landfill
Contaminated oily solids	N/R	N/R	-	no	67	drum	205 L	13,735	6,282	Energy recovery
	N/R	N/R	-	no	494	Quatrex	765 L	377,910	109,343	Energy recovery
Oily sludge and debris	N/R	N/R	-	no	6	tote	1,100 L	6,600	5,220	Energy recovery
Oily water	N/R	N/R	-	no	20	drum	205 L	4,100	3,025	Water treatment and oil recycling
	N/R	N/R	-	no	22	tote	1,100 L	24,200	14,350	Water treatment and oil recycling
Waste oil	N/R	N/R	-	no	211 105	drum tote	205 L 1100 L	94,613	84,205	Recycling
Antifreeze - concentration less than 30% mixed with used oil in drum and tote	N/R	N/R	-	no				5,121	5,121	Incineration
Oily water mixed with used oil in drum 205 L and tote 1100 L	N/R	N/R	-	no				8,537	8,537	Water treatment and oil recycling

UN 1950, waste, aerosol, flammable	1950	2.1	-	no	1	drum	205 L	205	69	Recycling
Waste, antifreeze - concentration less than 30%	N/R	N/R	-	no	1	drum	205 L	205	167	Incineration
	N/R	N/R	-	no	26	tote	1,100 L	28,600	25,917	Incineration
Waste, antifreeze - concentration greater than 30%	N/R	N/R	-	no	17	drum	205 L	3,485	3,705	Recycling
	N/R	N/R	-	no	95	tote	1,100 L	104,500	96,695	Recycling
Waste, ash	N/R	N/R	-	no	73	drum	205 L	14,965	8,945	Secure landfill
Waste, de-icing fluid for aircraft	N/R	N/R	-	no	1	drum	205 L	205	180	Energy recovery
UN 1202, waste diesel, fuel	1202	3	III	yes	26	drum	205 L	5,330	3,720	Energy recovery
	1202	3	III	yes	9	tote	1,100 L	9,900	4,825	Energy recovery
UN 1863, waste, fuel, aviation, turbine engine	1863	3	III	yes	6	drum	205 L	1,230	602	Energy recovery
UN 1203, waste, gasoline	1203	3	II	yes	2	drum	205 L	410	317	Energy recovery
Waste grease	N/R	N/R	-	no	16	drum	60 L	960	1 018	Secure landfill
	N/R	N/R	-	no	120	drum	205 L	24,600	14,606	Secure landfill
	N/R	N/R	-	no	6	drum, overpack	255 L	1,530	1,329	Secure landfill
Waste kitchen grease	N/R	N/R	-	no	73	drum	205 L	14,965	12,231	Energy recovery
Waste oil filters	N/R	N/R	-	no	213	drum	205 L	43,665	25,705	Metal recycling and energy recovery
	N/R	N/R	-	no	4	Quatrex	765 L	3,060	715	Metal recycling and energy recovery
UN 1263, waste paints	1203	3	III	yes	2	drum	205 L	410	218	Energy recovery
Water treatment sludges from STP	N/R	N/R	-	no	25	tote	1,100 L	27,500	25,713	Incineration
Mix of empty calcium chloride bags, contaminated plastics, hydraulic hoses, etc.	N/R	N/R	-	no	11	m.t.	-	16,215	10,600	Secure landfill
							TOTAL	**883,346**	**482,968**	

In 2018, Agnico generated approximately 14,636 tonnes of waste for Meadowbank and Whale Tail Site. This represents 75.7% of general waste disposed in the landfill, 6.3% of organic waste disposed in the incinerator, 14.8% of waste recycled on and off-site, and 3.3 % of industrial/hazardous waste sent to an approval facility off-site. As shown of Table 6.4 below the percentage of waste recycle, disposed on site or off-site are very similar to last year.

Table 6.4. Percentage of Waste disposed from 2015-2018

Waste	2015 Weight (tonne)	2016 Weight (tonne)	2017 Weight (tonne)	2018 Weight (tonne)	2015 Total waste (%)	2016 Total waste (%)	2017 Total waste (%)	2018 Total waste (%)	Disposal Recycling location
General	8,561	8,672	8,403	11,073	74.9	76.5	78.7	75.7	Landfill On-site disposal
Organic	545	541	557	924[1]	4.8	4.8	5.2	6.3	Incinerator On-site disposal
Industrial/ Hazardous	289	161	243	483	2.5	1.4	2.3	3.3	Off-site disposal + recycling
Waste oil	358	280	280	337	3.1	2.5	2.6	2.3	On-site recycling
Steel	1,449	1,550	1,097	1,690	12.7	13.6	10.3	11.5	Off-site recycling
Wood	88	55	0	0	0.8	0.5	0	0	Baker lake recycling
Batteries	38	17	17	18.8	0.3	0.1	0.2	0.1	Off-site recycling
Tire	97.3	67	81	110	0.9	0.6	0.8	0.8	Off-site recycling
TOTAL	**11,425**	**11,343**	**10,678**	**14,636**	**100**	**100**	**100**	**100**	

1- *Volume of organic waste sent to the Meadowbank Site incinerator is 536 tonnes and to Whale Tail Site incinerator is 388 tonnes.*

Several projects for waste reduction/recycling were undertaken or were ongoing in 2018 at Meadowbank:

- Recycling of used protective personnel equipment (PPE)
  - The objective of the Used PPE Project is to provide a second life to reusable PPEs. With the collaboration of all departments, Agnico collected used PPE around the Meadowbank site to create a used PPE inventory. This used PPE is now reused instead of ordering new equipment and disposing of reusable materials in the landfill. This initiative has been successful in reducing waste sent to landfill and as an overall cost saving measure.
- Waste oil recycling plan
  - Agnico has an existing waste oil reuse plan. In 2018 Agnico reused approximately 382,9 m^3 of waste oil as a fuel source in the on-site incinerator (50.2 m^3) and in waste oil heaters (332.7 m^3). Table 6.13 provides a breakdown of the volume of waste oil

incinerated by month. Major part of waste oil produced in 2017 was kept onsite, filtered and reused. Agnico is planning on continuing to reuse all waste oil produced in 2018 during 2019.

- Steel Recycling
    - A total of 1,690 tonnes of steel was packaged and transported south for recycling. This material was removed from our solid waste stream and not landfilled on site.
- Aluminum Recycling
    - In 2018, aluminum pop cans were donated to local groups as was done in previous years. It is anticipated that these will be donated in 2019 to a local charity or shipped south for recycling.
- Battery recycling
    - In 2018, 18.8 tonnes of batteries were shipped south and recycled in an accredited facility.
- Tire recycling
    - In 2018, 110 tonnes of scrap tire were shipped south and recycled in an accredited facility.
- Composter
    - In 2019, Agnico will have in place a composter in order to reduce the quantity of waste burned by the incinerator.

6.1.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 11: ***A summary report of all general waste disposal activities including monthly and annual quantities in cubic metres of waste generated and location of disposal***

As detailed in Section 6.1.1 above, all hazardous and non-hazardous waste that required an off-site disposal to an accredited facilities for recycling or disposal according to regulations are sent to Meadowbank Site by the Whale Tail Haul Road. From there, the hazardous and non-hazardous waste are segregated along with the waste generated by the Meadowbank Site. There is no distinction possible between the site provenance of the waste. A description of the types of waste, packaging and volume is provided in Table 6.3.

All inert waste that can be landfilled, consisting primarily of plastics, fiberglass, wood, cardboard, rubber, clothing and some metal that was not recycled, are transported via the Whale Tail Haul Road to the Meadowbank Landfill. Section 6.1.1 and Table 6.2 above detailed the landfilling activities for 2018. There is no distinction possible between the volume site provenance of inert waste.

In 2018, Agnico still considers the camp and all the facilities associated to be the Amaruq Exploration Camp. For this reason, all domestic/organic waste generated by the camp was incinerated in a dual-chamber incinerator under the authorized Water License 2BB-MEA1828. More detail can be found in Section 6.1.3 below.

6.1.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part J, Item 7: ***The Licensee shall provide the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where wastes associated with camp operations and exploration activities are deposited including sump locations associated with drilling and drill casings left as stuck and cut off and for further drilling in casings***

In 2018, Agnico still considers the camp and all the facilities associated to be the Amaruq Exploration Camp. For this reason, all domestic waste generated by the camp was incinerated in a dual-chamber incinerator under the authorized Water License 2BB-MEA1828. A monthly summary of the amount of waste transferred to the incinerator in 2018 is included in Table 6.5. A total of 2,715.9 m^3 were incinerated.

Table 6.5 2018 Volume of waste transferred to Whale Tail exploration incinerator

Month	Volume of waste send to incinerator (m^3)
January	226.3
February	226.3
March	104.0
April	114.4
May	219.7
June	109.2
July	210.6
August	362.7
September	140.4
October	361.4
November	145.6
December	495.3
TOTAL	**2,715.9**

As detailed in Section 6.1.1 and 6.1.2 above, all hazardous and non-hazardous waste that required an off-site disposal to an accredited facilities for recycling or disposal according to regulations are sent to Meadowbank Site by the Whale Tail Haul Road. From there, the hazardous and non-hazardous waste are segregated along with the waste generated by the Meadowbank Site.

The drilling waste (cutting) generated during the on-ice drilling, is recovered in containers during the drilling and transported on land or is pumped in sludge line to land and disposed of at least 31 meters from any water body where no connection with water will occur (Table 6.6).

For the drilling waste (cutting) generated during the on land drilling, it is disposed of near each drilling site in a natural depression where there is no risk of runoff to the water bodies (Table 6.7).

Table 6.6. Whale Tail Exploration coordinates for drilling waste disposal coming from drilling on ice

Sludge Dump 2018	UTMX	UTMY	Longitude	Latitude
Sludge Dump 1	606559	7255041	65*24'02.1"	096*42'19.8"
Sludge Dump 2	607508	7255484	65*24'15.3"	096*41'05.1"
Sludge Dump 3	607489	7255894	65*24'28.5"	096*41'05.4"
Sludge Dump 4	607749	7255858	65*24'26.9"	096*40'45.4"
Sludge Dump 5	607728	7255896	65*24'28.3"	096*40'46.8"
Sludge Dump 6	607485	7256376	65*24'44.1"	096*41'04.3"
Sludge Dump 7	606243	7255701	65*24'23.8"	096*42'42.5"
Sludge Dump 8	606064	7255440	65*24'15.6"	096*42'57.0"
Sludge Dump 9	606767	7255137	65*24'05.0"	096*42'03.4"
Sludge Dump 10	607584	7255818	65*24'26.0"	096*40'58.2"
Sludge Dump 11	606970	7254897	65*23'57.0"	096*41'48.4"
Sludge Dump 12	607989	7256245	65*24'39.3"	096*40'25.6"
Sludge Dump 13	606488	7254652	65*23'49.7"	096*42'26.4"

Table 6.7 Whale Tail exploration coordinates for drilling waste disposal coming from drilling on land

HOLE ID	Longitude	Latitude	HOLE ID	Longitude	Latitude	HOLE ID	Longitude	Latitude
DN18-016	96° 8' 30.412" W	65° 9' 39.495" N	AMQ18-1679A	96° 42' 29.967" W	65° 24' 12.721" N	AMQ18-1842	96° 42' 42.688" W	65° 24' 3.745" N
JAG18-001	96° 9' 45.323" W	65° 2' 35.258" N	AMQ18-1680	96° 42' 14.965" W	65° 24' 13.850" N	AMQ18-1843	96° 42' 59.011" W	65° 23' 56.007" N
JAG18-002	96° 9' 50.570" W	65° 2' 39.884" N	AMQ18-1681	96° 42' 30.936" W	65° 24' 12.036" N	AMQ18-1844	96° 43' 4.749" W	65° 23' 51.968" N
JAG18-003	96° 9' 38.493" W	65° 2' 43.993" N	AMQ18-1682	96° 42' 32.901" W	65° 24' 11.906" N	AMQ18-1845	96° 40' 50.953" W	65° 24' 30.826" N
7014-18-001	96° 24' 21.007" W	65° 18' 16.967" N	AMQ18-1683	96° 42' 35.453" W	65° 24' 11.015" N	AMQ18-1845A	96° 40' 50.953" W	65° 24' 30.826" N
7014-18-002	96° 23' 34.291" W	65° 18' 24.125" N	AMQ18-1684	96° 42' 37.527" W	65° 24' 10.092" N	AMQ18-1846	96° 42' 40.548" W	65° 24' 3.088" N
7014-18-003	96° 23' 20.518" W	65° 18' 24.611" N	AMQ18-1685	96° 42' 37.771" W	65° 24' 9.313" N	AMQ18-1847	96° 42' 13.025" W	65° 24' 23.036" N
7014-18-004	96° 23' 20.095" W	65° 18' 13.666" N	AMQ18-1686	96° 42' 16.159" W	65° 24' 14.760" N	AMQ18-1847A	96° 42' 13.020" W	65° 24' 23.034" N
7014-18-005	96° 21' 18.093" W	65° 18' 23.949" N	AMQ18-1687	96° 42' 14.205" W	65° 24' 14.557" N	AMQ18-1848	96° 42' 14.190" W	65° 24' 6.855" N
7014-18-006	96° 20' 11.602" W	65° 18' 22.856" N	AMQ18-1688	96° 42' 22.785" W	65° 24' 6.157" N	AMQ18-1849	96° 42' 24.674" W	65° 24' 9.617" N
7014-18-008	96° 22' 6.528" W	65° 17' 27.651" N	AMQ18-1689	96° 42' 15.026" W	65° 24' 15.360" N	AMQ18-1850	96° 42' 28.337" W	65° 24' 24.240" N
7014-18-009	96° 22' 5.157" W	65° 17' 28.997" N	AMQ18-1690	96° 42' 11.840" W	65° 24' 15.218" N	AMQ18-1850A	96° 42' 28.337" W	65° 24' 24.240" N
7014-RAB18-001	96° 23' 49.637" W	65° 15' 31.859" N	AMQ18-1691	96° 42' 8.321" W	65° 24' 14.048" N	AMQ18-1851	96° 42' 20.094" W	65° 24' 4.196" N
7014-RAB18-002	96° 23' 46.458" W	65° 15' 32.806" N	AMQ18-1692	96° 42' 30.358" W	65° 24' 4.925" N	AMQ18-1852	96° 42' 35.597" W	65° 24' 31.692" N
7014-RAB18-003	96° 23' 43.356" W	65° 15' 33.755" N	AMQ18-1693	96° 40' 44.144" W	65° 23' 53.272" N	AMQ18-1853	96° 42' 14.185" W	65° 24' 11.057" N
7014-RAB18-004	96° 23' 40.258" W	65° 15' 34.671" N	AMQ18-1694	96° 42' 5.406" W	65° 24' 13.153" N	AMQ18-1854	96° 42' 39.689" W	65° 24' 32.092" N
7014-RAB18-005	96° 23' 59.962" W	65° 15' 34.333" N	AMQ18-1695	96° 42' 5.828" W	65° 24' 11.571" N	AMQ18-1855	96° 42' 3.231" W	65° 24' 3.976" N
7014-RAB18-006	96° 23' 56.931" W	65° 15' 35.347" N	AMQ18-1696	96° 42' 9.734" W	65° 24' 12.566" N	AMQ18-1855A	96° 42' 3.231" W	65° 24' 3.976" N
7014-RAB18-007	96° 23' 53.967" W	65° 15' 36.460" N	AMQ18-1697	96° 40' 41.413" W	65° 24' 37.290" N	AMQ18-1856	96° 40' 44.725" W	65° 24' 27.871" N
7014-RAB18-008	96° 23' 52.075" W	65° 15' 30.609" N	AMQ18-1697A	96° 40' 41.413" W	65° 24' 37.290" N	AMQ18-1856A	96° 40' 44.725" W	65° 24' 27.871" N
7014-RAB18-009	96° 23' 49.416" W	65° 15' 31.759" N	AMQ18-1697B	96° 40' 41.413" W	65° 24' 37.290" N	AMQ18-1856B	96° 40' 44.725" W	65° 24' 27.871" N
7014-RAB18-010	96° 23' 45.032" W	65° 15' 26.931" N	AMQ18-1697C	96° 40' 41.413" W	65° 24' 37.290" N	AMQ18-1857	96° 42' 40.550" W	65° 24' 30.456" N
7014-RAB18-011	96° 23' 41.998" W	65° 15' 27.978" N	AMQ18-1698	96° 42' 20.694" W	65° 24' 5.617" N	AMQ18-1858	96° 41' 2.928" W	65° 25' 6.772" N
7014-RAB18-012	96° 23' 39.114" W	65° 15' 29.059" N	AMQ18-1699	96° 42' 13.462" W	65° 24' 12.354" N	AMQ18-1859	96° 41' 0.118" W	65° 25' 4.680" N
WH18-005	96° 27' 44.895" W	64° 35' 56.547" N	AMQ18-1700	96° 40' 47.073" W	65° 23' 53.382" N	AMQ18-1860	96° 43' 15.677" W	65° 23' 53.214" N
WH18-006	96° 27' 52.932" W	64° 35' 59.788" N	AMQ18-1701	96° 42' 18.782" W	65° 24' 5.867" N	AMQ18-1862	96° 48' 37.998" W	65° 24' 0.126" N
WH18-007	96° 27' 41.377" W	64° 35' 56.978" N	AMQ18-1702	96° 40' 50.046" W	65° 23' 53.020" N	AMQ18-1863	96° 41' 15.126" W	65° 25' 3.948" N

WH18-007A	96° 27' 41.377" W	64° 35' 56.978" N	AMQ18-1703	96° 40' 51.998" W	65° 23' 52.987" N	AMQ18-1864	96° 41' 16.128" W	65° 25' 6.412" N
WH18-008	96° 22' 29.008" W	64° 35' 59.000" N	AMQ18-1704	96° 42' 17.880" W	65° 24' 8.491" N	AMQ18-1865	96° 48' 27.768" W	65° 23' 58.172" N
WH18-009	96° 22' 52.438" W	64° 35' 56.352" N	AMQ18-1704A	96° 42' 17.861" W	65° 24' 8.485" N	AMQ18-1866	96° 43' 4.540" W	65° 24' 23.194" N
WH18-010	96° 27' 28.668" W	64° 35' 35.270" N	AMQ18-1705	96° 42' 13.377" W	65° 24' 13.089" N	AMQ18-1867	96° 40' 19.651" W	65° 24' 37.567" N
WH18-011	96° 33' 46.397" W	64° 34' 25.284" N	AMQ18-1706	96° 40' 54.127" W	65° 23' 52.789" N	AMQ18-1867A	96° 40' 19.640" W	65° 24' 37.560" N
WH18-012	96° 33' 24.018" W	64° 34' 14.752" N	AMQ18-1708	96° 42' 29.146" W	65° 24' 5.294" N	AMQ18-1867B	96° 40' 19.640" W	65° 24' 37.560" N
WH18-013	96° 31' 1.775" W	64° 35' 26.461" N	AMQ18-1709	96° 42' 11.295" W	65° 24' 13.638" N	AMQ18-1867C	96° 40' 19.640" W	65° 24' 37.560" N
WH18-014	96° 31' 20.855" W	64° 35' 25.230" N	AMQ18-1710	96° 41' 36.128" W	65° 23' 48.581" N	AMQ18-1868	96° 48' 35.779" W	65° 23' 54.268" N
WH18-015	96° 33' 33.290" W	64° 34' 7.252" N	AMQ18-1711	96° 41' 13.939" W	65° 24' 13.168" N	AMQ18-1869	96° 46' 42.578" W	65° 22' 50.556" N
WH18-016	96° 22' 0.850" W	64° 36' 22.199" N	AMQ18-1712	96° 42' 9.989" W	65° 24' 13.971" N	AMQ18-1870	96° 41' 14.136" W	65° 24' 13.467" N
AMQ17-1607B	96° 42' 52.432" W	65° 24' 19.532" N	AMQ18-1713	96° 41' 38.553" W	65° 23' 48.231" N	AMQ18-1872	96° 45' 6.064" W	65° 24' 41.392" N
AMQ17-1607C	96° 42' 52.432" W	65° 24' 19.532" N	AMQ18-1714	96° 41' 41.653" W	65° 23' 47.691" N	AMQ18-1873	96° 49' 0.665" W	65° 23' 45.784" N
AMQ17-1620	96° 41' 12.702" W	65° 24' 27.569" N	AMQ18-1715	96° 41' 14.496" W	65° 24' 14.052" N	AMQ18-1874	96° 46' 49.150" W	65° 22' 50.461" N
AMQ18-1564A	96° 40' 56.432" W	65° 24' 26.167" N	AMQ18-1717	96° 42' 12.556" W	65° 24' 14.434" N	AMQ18-1875	96° 45' 9.147" W	65° 24' 46.838" N
AMQ18-1564B	96° 40' 56.432" W	65° 24' 26.167" N	AMQ18-1718	96° 42' 5.431" W	65° 24' 12.815" N	AMQ18-1876	96° 42' 22.595" W	65° 24' 6.075" N
AMQ18-1564C	96° 40' 56.432" W	65° 24' 26.167" N	AMQ18-1719	96° 42' 47.786" W	65° 24' 8.277" N	AMQ18-1877	96° 49' 11.155" W	65° 23' 48.571" N
AMQ18-1624	96° 42' 31.094" W	65° 24' 6.635" N	AMQ18-1721	96° 43' 54.148" W	65° 24' 18.588" N	AMQ18-1878	96° 46' 40.552" W	65° 22' 53.187" N
AMQ18-1625	96° 42' 19.618" W	65° 24' 6.522" N	AMQ18-1722	96° 43' 48.620" W	65° 24' 18.222" N	AMQ18-1880	96° 45' 45.487" W	65° 24' 46.084" N
AMQ18-1626	96° 42' 34.057" W	65° 24' 5.341" N	AMQ18-1724	96° 43' 40.766" W	65° 24' 18.124" N	AMQ18-1881	96° 49' 15.986" W	65° 23' 55.353" N
AMQ18-1627	96° 42' 33.143" W	65° 24' 6.171" N	AMQ18-1725	96° 42' 48.601" W	65° 24' 8.817" N	AMQ18-1882	96° 47' 14.336" W	65° 23' 17.267" N
AMQ18-1628	96° 42' 36.473" W	65° 24' 5.350" N	AMQ18-1725A	96° 42' 48.628" W	65° 24' 8.831" N	AMQ18-1883	96° 48' 50.660" W	65° 24' 10.053" N
AMQ18-1629	96° 42' 34.553" W	65° 24' 6.722" N	AMQ18-1726	96° 43' 34.243" W	65° 24' 18.528" N	AMQ18-1884	96° 46' 45.268" W	65° 22' 53.939" N
AMQ18-1630	96° 42' 38.738" W	65° 24' 5.264" N	AMQ18-1727	96° 43' 28.744" W	65° 24' 19.578" N	AMQ18-1885	96° 47' 3.771" W	65° 24' 29.446" N
AMQ18-1631	96° 42' 35.724" W	65° 24' 7.276" N	AMQ18-1728	96° 43' 47.357" W	65° 24' 18.738" N	AMQ18-1886	96° 40' 45.683" W	65° 24' 28.818" N
AMQ18-1632	96° 42' 40.946" W	65° 24' 5.393" N	AMQ18-1729	96° 43' 49.019" W	65° 24' 17.412" N	AMQ18-1886A	96° 40' 45.683" W	65° 24' 28.818" N
AMQ18-1633	96° 42' 39.634" W	65° 24' 5.733" N	AMQ18-1730	96° 42' 36.598" W	65° 23' 58.018" N	AMQ18-1888	96° 48' 22.506" W	65° 24' 8.295" N
AMQ18-1634	96° 42' 37.557" W	65° 24' 7.249" N	AMQ18-1731	96° 41' 48.645" W	65° 24' 55.663" N	AMQ18-1889	96° 46' 56.384" W	65° 22' 46.673" N
AMQ18-1635	96° 42' 41.683" W	65° 24' 6.019" N	AMQ18-1732	96° 41' 45.739" W	65° 24' 56.079" N	AMQ18-1890	96° 46' 29.499" W	65° 24' 28.098" N
AMQ18-1636	96° 42' 37.730" W	65° 24' 6.014" N	AMQ18-1734	96° 41' 44.944" W	65° 24' 57.429" N	AMQ18-1891	96° 48' 57.107" W	65° 23' 25.690" N
AMQ18-1637	96° 42' 43.396" W	65° 24' 5.781" N	AMQ18-1735	96° 42' 1.695" W	65° 24' 49.255" N	AMQ18-1891A	96° 48' 57.105" W	65° 23' 25.685" N

AMQ18-1638	96° 42' 27.758" W	65° 24' 10.231" N	AMQ18-1737	96° 40' 49.885" W	65° 24' 39.548" N	AMQ18-1892	96° 47' 51.263" W	65° 24' 1.968" N
AMQ18-1639	96° 42' 36.313" W	65° 24' 6.490" N	AMQ18-1738	96° 41' 51.971" W	65° 24' 50.281" N	AMQ18-1893	96° 45' 55.045" W	65° 24' 33.131" N
AMQ18-1640	96° 42' 6.187" W	65° 24' 10.438" N	AMQ18-1739	96° 40' 39.047" W	65° 24' 33.369" N	AMQ18-1894	96° 43' 40.856" W	65° 24' 20.143" N
AMQ18-1641	96° 42' 45.523" W	65° 24' 23.120" N	AMQ18-1739A	96° 40' 39.047" W	65° 24' 33.369" N	AMQ18-1896	96° 48' 47.676" W	65° 23' 29.804" N
AMQ18-1641A	96° 42' 45.523" W	65° 24' 23.120" N	AMQ18-1739B	96° 40' 39.047" W	65° 24' 33.369" N	AMQ18-1897	96° 42' 20.523" W	65° 24' 4.585" N
AMQ18-1641B	96° 42' 45.523" W	65° 24' 23.120" N	AMQ18-1739C	96° 40' 39.047" W	65° 24' 33.369" N	AMQ18-1898	96° 44' 10.551" W	65° 24' 31.927" N
AMQ18-1641C	96° 42' 45.523" W	65° 24' 23.120" N	AMQ18-1739D	96° 40' 39.047" W	65° 24' 33.369" N	AMQ18-1899	96° 40' 45.550" W	65° 24' 38.017" N
AMQ18-1642	96° 42' 28.055" W	65° 24' 11.271" N	AMQ18-1740	96° 41' 50.817" W	65° 24' 53.332" N	AMQ18-1900	96° 47' 48.842" W	65° 23' 49.308" N
AMQ18-1643	96° 42' 31.316" W	65° 24' 11.257" N	AMQ18-1744	96° 42' 54.457" W	65° 23' 55.471" N	AMQ18-1901	96° 42' 55.036" W	65° 24' 43.056" N
AMQ18-1644	96° 42' 28.867" W	65° 24' 12.117" N	AMQ18-1749	96° 40' 54.924" W	65° 24' 22.886" N	AMQ18-1902	96° 40' 41.904" W	65° 24' 37.279" N
AMQ18-1645	96° 42' 4.154" W	65° 24' 10.594" N	AMQ18-1750	96° 40' 54.946" W	65° 24' 22.881" N	AMQ18-1903	96° 42' 9.958" W	65° 24' 23.418" N
AMQ18-1646	96° 42' 26.938" W	65° 24' 11.697" N	AMQ18-1751	96° 40' 43.933" W	65° 24' 32.013" N	AMQ18-1904	96° 41' 21.683" W	65° 24' 13.433" N
AMQ18-1647	96° 42' 24.454" W	65° 24' 12.373" N	AMQ18-1752	96° 40' 54.884" W	65° 24' 22.943" N	AMQ18-1905	96° 42' 51.257" W	65° 24' 41.058" N
AMQ18-1648	96° 42' 21.783" W	65° 24' 12.182" N	AMQ18-1754A	96° 42' 0.256" W	65° 24' 26.270" N	AMQ18-1906	96° 42' 18.031" W	65° 24' 22.957" N
AMQ18-1649	96° 42' 14.884" W	65° 24' 11.217" N	AMQ18-1756	96° 42' 37.996" W	65° 23' 57.687" N	AMQ18-1907	96° 42' 9.064" W	65° 24' 2.421" N
AMQ18-1650	96° 42' 21.442" W	65° 24' 13.166" N	AMQ18-1775	96° 42' 43.254" W	65° 24' 13.275" N	AMQ18-1908	96° 42' 8.850" W	65° 24' 26.204" N
AMQ18-1650A	96° 42' 21.442" W	65° 24' 13.166" N	AMQ18-1790	96° 42' 25.093" W	65° 24' 23.568" N	AMQ18-1912	96° 42' 54.291" W	65° 24' 14.152" N
AMQ18-1651	96° 42' 5.783" W	65° 24' 11.279" N	AMQ18-1795	96° 42' 9.022" W	65° 24' 25.880" N	AMQ18-1913	96° 42' 45.587" W	65° 24' 13.905" N
AMQ18-1651A	96° 42' 5.783" W	65° 24' 11.279" N	AMQ18-1803	96° 41' 6.417" W	65° 24' 39.363" N	AMQRAB18-062	96° 43' 25.708" W	65° 24' 10.829" N
AMQ18-1652	96° 42' 20.646" W	65° 24' 12.719" N	AMQ18-1804	96° 42' 27.643" W	65° 24' 21.754" N	AMQRAB18-063	96° 43' 22.479" W	65° 24' 12.205" N
AMQ18-1653	96° 42' 17.654" W	65° 24' 11.882" N	AMQ18-1807	96° 42' 34.620" W	65° 24' 11.808" N	AMQRAB18-064	96° 43' 28.330" W	65° 24' 9.502" N
AMQ18-1654	96° 42' 6.711" W	65° 24' 14.212" N	AMQ18-1809	96° 42' 32.144" W	65° 24' 12.870" N	AMQRAB18-065	96° 43' 27.037" W	65° 24' 10.106" N
AMQ18-1655	96° 42' 15.769" W	65° 24' 8.774" N	AMQ18-1810	96° 42' 29.969" W	65° 24' 13.576" N	AMQRAB18-066	96° 43' 24.051" W	65° 24' 11.497" N
AMQ18-1656	96° 42' 18.733" W	65° 24' 12.425" N	AMQ18-1821	96° 42' 34.574" W	65° 24' 21.418" N	AMQRAB18-067	96° 43' 38.146" W	65° 25' 23.983" N
AMQ18-1658	96° 42' 19.374" W	65° 24' 13.041" N	AMQ18-1824	96° 42' 5.344" W	65° 24' 25.381" N	AMQRAB18-068	96° 41' 55.272" W	65° 25' 10.423" N
AMQ18-1659	96° 42' 21.121" W	65° 24' 9.179" N	AMQ18-1825	96° 42' 3.867" W	65° 24' 13.227" N	AMQRAB18-068A	96° 41' 55.272" W	65° 25' 10.423" N
AMQ18-1660	96° 42' 18.275" W	65° 24' 13.771" N	AMQ18-1827	96° 42' 0.850" W	65° 24' 4.241" N	AMQRAB18-069	96° 41' 51.680" W	65° 25' 9.491" N
AMQ18-1661	96° 42' 7.607" W	65° 24' 14.785" N	AMQ18-1829	96° 42' 41.492" W	65° 24' 14.256" N	AMQRAB18-070	96° 41' 48.056" W	65° 25' 8.283" N
AMQ18-1662	96° 42' 20.462" W	65° 24' 14.964" N	AMQ18-1830	96° 42' 51.502" W	65° 24' 19.546" N	AMQRAB18-071	96° 41' 43.359" W	65° 25' 7.477" N
AMQ18-1663	96° 42' 15.588" W	65° 24' 12.413" N	AMQ18-1830A	96° 42' 51.502" W	65° 24' 19.546" N	AMQRAB18-072	96° 41' 35.548" W	65° 25' 5.479" N

AMQ18-1664	96° 42' 23.457" W	65° 24' 13.739" N	AMQ18-1830B	96° 42' 51.502" W	65° 24' 19.546" N	AMQRAB18-073	96° 41' 33.061" W	65° 25' 4.824" N
AMQ18-1665	96° 42' 9.184" W	65° 24' 16.001" N	AMQ18-1830C	96° 42' 51.502" W	65° 24' 19.546" N	AMQRAB18-074	96° 41' 4.795" W	65° 25' 25.408" N
AMQ18-1666	96° 42' 26.079" W	65° 24' 13.054" N	AMQ18-1831	96° 42' 37.118" W	65° 24' 25.255" N	AMQRAB18-075	96° 41' 7.137" W	65° 25' 26.803" N
AMQ18-1667	96° 42' 16.101" W	65° 24' 13.486" N	AMQ18-1831A	96° 42' 37.118" W	65° 24' 25.255" N	AMQRAB18-076	96° 41' 9.299" W	65° 25' 28.183" N
AMQ18-1668	96° 42' 10.934" W	65° 24' 15.797" N	AMQ18-1832	96° 42' 37.067" W	65° 24' 4.591" N	AMQRAB18-077	96° 41' 11.674" W	65° 25' 29.525" N
AMQ18-1669	96° 42' 28.373" W	65° 23' 59.918" N	AMQ18-1833	96° 42' 44.296" W	65° 24' 14.939" N	AMQRAB18-078	96° 41' 13.768" W	65° 25' 30.853" N
AMQ18-1669A	96° 42' 28.373" W	65° 23' 59.918" N	AMQ18-1834	96° 42' 35.961" W	65° 24' 25.520" N	AMQRAB18-079	96° 40' 10.326" W	65° 25' 29.748" N
AMQ18-1670	96° 42' 16.740" W	65° 24' 14.091" N	AMQ18-1834A	96° 42' 35.961" W	65° 24' 25.520" N	AMQRAB18-080	96° 40' 12.465" W	65° 25' 31.218" N
AMQ18-1671	96° 42' 9.872" W	65° 24' 16.468" N	AMQ18-1835	96° 42' 44.548" W	65° 23' 58.156" N	AMQRAB18-081	96° 40' 21.852" W	65° 25' 36.877" N
AMQ18-1672	96° 42' 12.434" W	65° 24' 15.916" N	AMQ18-1836	96° 42' 5.178" W	65° 24' 3.030" N	AMQRAB18-082	96° 40' 24.107" W	65° 25' 38.271" N
AMQ18-1675	96° 42' 25.661" W	65° 24' 13.930" N	AMQ18-1837	96° 42' 30.485" W	65° 24' 5.148" N	AMQRAB18-083	96° 40' 26.544" W	65° 25' 39.693" N
AMQ18-1676	96° 42' 27.905" W	65° 24' 12.715" N	AMQ18-1838	96° 42' 50.766" W	65° 24' 12.398" N	AMQRAB18-084	96° 40' 28.874" W	65° 25' 41.037" N
AMQ18-1677	96° 42' 34.276" W	65° 24' 22.306" N	AMQ18-1839	96° 42' 20.401" W	65° 24' 4.352" N	AMQRAB18-085	96° 40' 33.238" W	65° 25' 32.267" N
AMQ18-1677A	96° 42' 34.276" W	65° 24' 22.306" N	AMQ18-1839A	96° 42' 20.401" W	65° 24' 4.352" N	AMQRAB18-086	96° 40' 35.574" W	65° 25' 33.657" N
AMQ18-1677B	96° 42' 34.276" W	65° 24' 22.306" N	AMQ18-1840	96° 42' 25.172" W	65° 24' 22.820" N	AMQRAB18-087	96° 40' 37.714" W	65° 25' 34.893" N
AMQ18-1678	96° 42' 27.861" W	65° 24' 13.540" N	AMQ18-1841	96° 42' 1.574" W	65° 24' 4.324" N	AMQRAB18-088	96° 40' 27.906" W	65° 25' 35.528" N
AMQ18-1679	96° 42' 29.995" W	65° 24' 12.746" N	AMQ18-1841A	96° 42' 1.574" W	65° 24' 4.324" N	AMQRAB18-089	96° 40' 27.903" W	65° 25' 35.560" N

Table 6.8. Whale Tail exploration coordinates for casings left on the field

HOLE	UTMX	UTMY	hddd*mm'ss.s" N	hddd*mm'ss.s" W
AMQ17-1607	606120	7255563	65*24'19.5"	096*42'52.4"
AMQ18-1641	606203	7255679	65*24'23.1"	096*42'45.6"
AMQ18-1677	606349	7255659	65*24'22.3"	096*42'34.3"
AMQ18-1743	606752.000	7255725	65*24'24.0"	096*42'03.0"
AMQ18-1748	606904	7255896	65*24'29.3"	096*41'50.7"
AMQ18-1756	606303	7254893	65*23'57.6"	096*42'40.1"
AMQ18-1821	606345	7255633	65*24'21.5"	096*42'34.7"
AMQ18-1843	606061	7254832	65*23'56.0"	096*42'59.0"
AMQ18-1845A	607673	7255970	65*24'30.8"	096*40'50.9"
AMQ18-1870	607393	7255423	65*24'13.5"	096*41'14.1"
AMQ18-1875	604327	7256344	65*24'46.8"	096*45'09.1"
AMQ18-1886A+B	607743	7255910	65*24'28.8"	096*40'45.7"
AMQ18-1895A	608068	7256194	65*24'37.6"	096*40'19.7"
AMQ18-1899	607734	7256195	65*24'38.0"	096*40'45.5"
AMQ18-1902	607782	7256174	65*24'37.2"	096*40'41.9"
AMQ18-1904	607297	7255417	65*24'13.4"	096*41'21.6"

6.2 INCINERATOR

6.2.1 Meadowbank Site

As per NWB Water License 2AM-MEA1526 Schedule B, Item 12: ***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 2018. The incinerator daily report logbook is included in Appendix 23 and covers all months of the year. Based on the data, approximately 50% of the material incinerated was food waste; the other 50% was dry waste comprised of food containers, cardboard boxes, paper and absorbent rags. In 2018, a total of 3,749.4 m^3 burn in the incinerator. The location of the incinerator is highlighted in Figure 1.

In 2018, Agnico has noted that there are 8 times during 2018 where the temperatures did not reach 1,000°C in the secondary chamber. This represents 2.36% of the total burn, which can be considered as minor given the fact the incinerator is in full operation daily during the year. In 2018, the incinerator was in operation for 339 days. See Table 6.9 below showing lower temperatures incidences. Maintenance performed at the incinerator between 2014 and 2018 has been effective. Agnico will continue monitoring temperatures in the secondary chamber and conduct additional improvements at the incinerator if necessary. It also appears, after assessment, that overloading of the incinerator prior to start-up was the most probable explanation of the temperature not reaching the expected level. Increased focus on operators awareness was pursued through the year.

Table 6.9. 2018 dates of recorded daily average temperatures below 1,000°C for the Meadowbank Incinerator

Date	Temperature secondary chamber (°C)	Comments
January 16, 2018	937	NA
January 24, 2018	505	Incinerator not working properly and a maintenance was done
February 2, 2018	697	NA
February 3, 2018	962	NA
February 6, 2018	808	NA
March 20, 2018	369	Incinerator not working properly and a maintenance was done
June 29, 2018	948	NA
September 10, 2018	900	NA

In 2018, Agnico has continued to conduct weekly regular inspections at the incinerator and provided advice to the operator, if needed. Toolbox meetings were also conducted to stress the importance of maintaining a proper and detailed log of the Incinerator. Staff on site are also reminded regularly on proper waste segregation through departmental toolbox meetings and site wide communications.

The Energy and Infrastructure group, responsible for operating the incinerator, has also implemented training sessions on the operation of the equipment as part of the integration of new employees assigned to the incinerator. Regular preventive and corrective maintenances are done throughout the year to meet the required temperatures. If any issues are observed, repairs will be done to ensure compliance of the incinerator.

Maintenance work was conducted at the incinerator in 2014 and 2015. Work conducted was designed to maximise heat in the primary and secondary chambers to enhance gas burning. In June 2014, maintenance was conducted on both chambers of the incinerators. In the primary chamber, ceramic fiber blocks used as refractory material were replaced by firebricks on all walls excluding the ceiling. In February 2015, the first phase of the secondary chamber renovation was conducted. Firebricks were installed at the burner end of the chamber and on portions of the inner wall of the chamber. This work was continued in October 2015. In 2018, no major work other that regular maintenance was conducted on the incinerator.

Agnico will ensure that improvements are done towards ensuring that incinerator maintains consistently the required temperature all year long. Modifications could include additional information on the log sheets (time of readings, for example) to enable better referencing in troubleshooting issues.

6.2.1.1 Stack testing

As per discussions with Environment and Climate Change Canada, the frequency of stack testing changed in 2012 to every other year. Results from the 2014 test indicated that mercury level average (64.09 µg / Rm³ @ 11 % v/v O_2) exceeded the Environment Canada guideline (20 µg / Rm³ @ 11 % v/v O_2) during the incinerator stack testing. As a result, an investigation with Meadowbank's Energy and Infrastructure department was performed to determine the potential sources of this exceedance. Although Agnico had an alkaline battery recycling program, the investigation revealed that there could be a significant volume of batteries disposed of along with regular solid waste destined for the onsite incinerator. As a result, Agnico committed to conduct confirmatory stack testing in the summer of 2015 and implemented a comprehensive site wide information program to reinforce the requirements of the battery recycling program. It was also determined that a possible source of batteries going to the wrong disposal route was ones used around the living/camp facilities. Thus, the information provided to employees included flow chart on disposal within camp use. Information was posted on the Agnico intranet site, was discussed during meetings conducted by the Environmental Department and copies of the proper batteries disposal charts were distributed in all the dorm wings. This flowchart describes how batteries should properly be disposed of onsite. Waste management technical memos were also published on Agnico intranet and sent to all contractors and employees.

The number of quatrex of batteries backhauled in 2018 (Table 6.10) confirms the ongoing segregation efforts were effective at reducing the number of batteries burnt in the incinerator.

Table 6.10. Number of quatrex of batteries backhauled

Year	Quantity (unit)
2013	29
2014	12
2015	34
2016	20
2017	20
2018	47

In accordance with Agnico's Incinerator Waste Management Plan (Version 8, October 2018), stack testing was conducted from October 5th to 7th, 2018 by Consulair Air & Environment Global Management. The 2018 Stack Testing Report is provided in Appendix 24. Results from the 2018 test indicated that the application standards for dioxins and furans (PCDD/F) were met for all test, as well as the applicable mercury (Hg). Table 6.11 below also provide the summary results for the stack testing from 2014 to 2018.

Table 6.3 Meadowbank 2014- 2018 Stack Testing Results

Year	Mercury ($\mu g/Rm^3$ @ 11% v/v O_2)		Dioxins and Furans (ng/Rm^3 @ 11% v/v O_2)	
	GN Standard	Stack Testing Results (Average*)	GN Standard	Stack Testing Results (Average*)
2014	20	64.09	80	0.054
2015		<0.22		0.021
2016		<0.46		0.033
2017		3.8		0.022
2018		<0.19		0.010

R: Reference conditions 25 °C and 101.3 kPa on a dry basis

As per KIA recommendation regarding the 2015 Annual report: "*Agnico should implement more frequent stack testing if the biennial monitoring reveals exceedances in mercury, dioxin and/or furan emissions*". Agnico agrees and already increased the stack testing frequency when the mercury exceedance occurred in 2014. Additional stack testing were done yearly from 2015 to 2018 and results are all below the emission standard. Canada-wide Standards (CWS) for Dioxins and Furans and the CWS for Mercury Emissions states that "*where five years data has been accumulated with all results reported below the Level of Quantification (emission standard), the stack testing frequency may be revised to a biennial schedule*". In order to be compliant with these recommendations, Agnico will complete stack testing in 2019. The stack testing frequencies will then return to biennial if all results are below the emission standard limits following ECCC approbation.

6.2.1.2 Ash Monitoring

In 2018, Agnico monitored the ash quality twice a year as stated in the Incinerator Waste Management Plan. The purpose of sampling ash is to determine its acceptability for disposal in the landfill, pursuant to the GN Environmental Guidelines for Industrial Discharge. Given sampling conformity, ash was disposed of in the landfill for the whole 2018. Samples were collected from the incinerator on March 22nd and July 9th, 2018. Results contained in Table 6.12 indicate no exceedance of Environmental Guidelines for Industrial Discharge. Agnico will continue to monitor the ash quality bi-annually in 2019.

Table 6.12. Meadowbank 2018 Incinerator Ash Monitoring

Parameters	Units	Guideline for Industrial Waste Discharge*	2018-03-22	2018-07-09
Arsenic	mg/L	2.5	0.0124	< 0.0005
Barium	mg/L	100	0.2488	0.144
Cadmium	mg/L	0.5	0.0071	0.0124
Chromium	mg/L	5	0.0127	2.745
Lead	mg/L	5	< 0.0005	< 0.0005
Mercury	mg/L	0.1	0.00355	0.005
Selenium	mg/L	1	0.01	0.026
Silver	mg/L	5	< 0.0005	< 0.0005
Zinc	mg/L	500	125	< 0.001

Footnotes: * Government of Nunavut Environmental Guideline for Industrial Waste Discharges (D of SD, 2011).

6.2.1.3 Waste Oil Monitoring

In 2018, approximately 50.20 m^3 of waste oil was burned in the incinerator. Volumes of waste oil reused as fuel in 2018 are presented in Table 6.13.

Table 6.13. Meadowbank 2018 Volume of waste oil incinerated and consumed at the Meadowbank site.

Month	Volume of waste oil incinerated or consumed (at the incinerator) (m^3)	*Volume of waste oil incinerated or consumed (in the furnace (at Cat Dome, Blue coverall and SS Coverall) (m^3)
January	5.30	52.00
February	3.52	31.30
March	3.30	45.50
April	4.67	31.10
May	5.09	25.80
June	3.80	4.00
July	4.65	0.00
August	4.33	2.00
September	4.33	25.00
October	3.44	32.00
November	3.59	41.00
December	4.18	43.00
Total	**50.20**	**332.70**

No sampling frequency for waste oil is specified in the GN Environmental Guideline for Used Oil and Waste Fuel (2012). To ensure compliance with the Guideline parameters, Agnico sampled the waste oil feedstock twice a year. This data is presented in Table 6.14. In 2018, Agnico collected two (2) samples of waste oil, March 22, 2018 and July 9, 2018. All metals and PCB parameters met the GN Environmental Guideline.

Table 6.14. Meadowbank 2018 waste oil monitoring

Parameters	Units	Maximum Allowable Concentration *	2018-03-22	2018-07-09
Cadmium	mg/L	2	< 1	< 1
Chromium	mg/L	10	< 1	< 1
Lead	mg/L	100	< 5	< 5
PCB	mg/L	2	< 1	< 1
Total Halogen	mg/L	1000	< 25	89.4
Flash point	^oC	≥ 37.7	> 80	66

Footnotes: * GN Environmental Guideline for Used Oil and Waste Fuel (GN, 2012)

6.2.2 Whale Tail Site

As per Water License 2AM-WTP1826 Schedule B, Item 12: ***Reporting of Incinerator test results including the materials burned and the efficiency of the Incinerator in relation to effects on Water and the potential Deposit of Waste into Water***

There is currently no incinerator related to Water License 2AM-WTP1826.

6.2.3 Exploration Activity Whale Tail Site

As per Waste Management Plan (2017), Agnico is authorized to use an incinerator to disposed of solid waste from the accommodation camp, kitchen, shops, and offices that cannot be recycled. The incineration of waste will divert waste which could create odors and potentially attract wildlife. The materials to be incinerated is limited to putrescible waste such as paper, food packaging, food waste and wood.

As mentioned in Section 6.1.3 above, 2,715.9 m^3 of waste where sent to the exploration incinerator in 2018.

In 2018, Agnico the ash quality was monitored. As there is no regulatory testing frequency, Agnico is targeting to test six (6) times a year. In 2018, ash quality were monitored seven (7) time, however, sampling results in April and December were given in mg/kg and no comparison with the regulatory guideline were possible. Results for these two dates are not reported in Table 6.15. The sampling result for October 2018 indicated a small exceedance for chromium as per the GN Environmental Guidelines for Industrial Discharge. Agnico will continue to monitor the ash quality in 2019. The purpose of sampling ash in 2018 was to determine its acceptability for disposal in the Meadowbank landfill. However, in 2018, all ashes produced by the incinerator were shipped South and were landfilled offsite.

Table 6.15. 2018 Exploration Whale Tail Site Incinerator Ash Monitoring

Parameters	Units	Guideline for Industrial Waste Discharge*	2018-05-11	2018-06-18	2018-08-07	2018-09-03	2018-10-16
Arsenic	mg/L	2.5	0.0602	0.0033	< 0.0005	< 0.0005	0.0062
Barium	mg/L	100	0.2079	NA	< 0.0005	0.0513	0.2894
Cadmium	mg/L	0.5	0.0009	0.0357	< 0.0001	0.0156	0.0015
Chromium	mg/L	5	0.035	0.0625	< 0.0006	0.0146	**5.464**
Lead	mg/L	5	< 0.0005	< 0.0005	< 0.0005	0.0046	< 0.0005
Mercury	mg/L	0.1	< 0.000002	< 0.00002	0.00004	< 0.00002	0.00012
Selenium	mg/L	1	0.01	0.019	< 0.001	< 0.001	0.015
Silver	mg/L	5	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	500	0.602	48.98	< 0.001	1.16	0.023

Footnotes: * Government of Nunavut Environmental Guideline for Industrial Waste Discharges (D of SD, 2011).

As per the Waste Management Plan, the minimization of the creation of dioxin and furan compounds that are byproducts of the incineration of some wastes is principally accomplished through the segregation from the incinerated wastes;

- The elimination of potential mercury sources from the incinerated wastes;
- The segregation and elimination of waste oils and oil stained materials from the incinerated waste; and
- The segregation and elimination of industrial and household hazardous wastes from the incinerated waste.

6.3 ADDITIONAL INFORMATION

6.3.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 25: *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 2018.

6.3.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 25: *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 2018.

6.3.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6n: *Any other details on water use or waste disposal requested by the Board by the 1st of November of the year being reported*

The Board did not request any additional details on waste disposal in 2018.

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SECTION 7. SPILL MANAGEMENT

7.1 SPILL SUMMARY

The number of spill in 2018 for both Meadowbank and Whale Tail Site is summarize in Table 7.1 below. The construction of the Whale Tail Project has started in 2016 with the construction of the Amaruq Exploration Access Road (future Whale Tail Haul Road). For this reason, there is no spill to report from 2011 to 2015. Spill that occurred along the Amaruq Exploration Access Road were report in 2016 and 2017 in the report submitted as part of the NWB Water License 8BC-AEA1525, now cancelled as of November 2018 and are reported in the Table 7.1 below. In 2018, spills that occurred on Whale Tail Site and the Whale Tail Haul Road are part of the total spills.

To be consistent with previous years, Agnico will continue to present the spill for the Meadowbank Mine site, AWAR and Bake Laker infrastructures (Section 7.1.1) and the one for Whale Tail Site and Whale Tail Haul Road (Section 7.1.2) separately.

Table 7.1. Total reportable and non-reportable spills for the Meadowbank and Whale Tail Sites from 2011 to 2018

Year	Meadowbank Site			Whale Tail Site			Total both site
	Number Reportable Spills	Number Non-Reportable Spills	Total	Number Reportable Spills	Number Non-Reportable Spills	Total	
2011	12	68	**80**	NA	NA	**NA**	**80**
2012	16	82	**98**	NA	NA	**NA**	**98**
2013	7	85	**92**	NA	NA	**NA**	**92**
2014	9	63	**72**	NA	NA	**NA**	**72**
2015	18	148	**166**	NA	NA	**NA**	**166**
2016	34	374	**408**	0	14	**14**	**422**
2017	28	383	**411**	0	34	**34**	**445**
2018	26	217	**243**	15	114	**129**	**372**

In 2016, Agnico noticed an increase in reported spills and began a Spill Reduction Action Plan. Key Performance Indicators (KPI) were developed to monitor the reported spills. A Spill Frequency is calculated and reported to the daily management meeting. All spills are discussed daily in the management meeting with respective departments. The Spill Frequency is the ratio of the total number of spill to date in the year over the number of days in the current year. The total number of spill to date includes the spills internally reported as well as the spills reported to the regulators. This KPI is used to follow trends related to spill increase or reduction, and to guide corrective actions when required. As well, “bad actors” identified through the data collected on spill reports are now mentioned within the daily management meetings. This enabled site management to identify any potential risks and work on preventing further spills. As an example, a main loading equipment was parked in 2018 for overhaul and maintenance. During the work, an increased focus was also put on ensuring the hydraulic system was inspected and any correctives measures identified, executed. This included changing all hydraulic hoses and seals. As the Meadowbank operations shifts towards the Whale Tail project and equipment, this strategy will continue to be executed. Very cold conditions during the last winters also created extra pressure on equipment and attention was paid to operating practices on sites. This included the implementation of stand-down of machinery when conditions did not permit the safe operations of equipment. Thus preventing increased stress on hydraulic systems and overall mechanical parts and maintaining the fleet in proper state.

General awareness on spill management and reporting with management and operations were expanded by meeting equipment users and stakeholders. Increased focus on reporting, identifying and notifications assisted in finding opportunities of reduction and also contributed to the increase noted above. This process enabled proactive maintenance to be done on equipment identified and reduce the overall quantities of material spilled. At this time, the GN reportable spills have plateaued for Meadowbank (34 in 2016, 28 in 2017 and 26 in 2018). Mandatory spill training is included in the Meadowbank and Whale Tail sites induction and the Environmental Department is working in a collaborative approach to ensure field personnel are reminded consistently on best practices in spill management. Refresher training is also being developed. By continuing education and awareness within our sites, Agnico is confident that the overall environmental impacts are limited.

All internal reported spills and reported to regulators are managed according to the spill contingency plan. Spills are contained and cleaned, contaminated material is disposed to the appropriate area, such as the onsite landfarm and the clean-up actions are monitored by the Environment team.

To prevent and ensure all spills are reported internally, spill prevention training was provided to employees in 2018. Training activities include the following:

- All employees and contractors must participate in an induction session online prior to the arrival at the mine site, which includes a training section on spill management (prevention, reporting and cleaning).

- Every employee and contractor who operates a vehicle on site must participate in training on vehicle operation. Spill management is a component of this training session;

- Frequent toolbox meetings were given in 2018 by the Environmental Department to different departments at Meadowbank and Whale Tail. Topics during the meetings included spill reporting and spill response. Departments receiving these toolbox sessions included security, powerhouse, warehouse, mine, mill, maintenance, site services, camp, kitchen, FGL maintenance and others (housekeeping, Arctic Fuels, etc.);

- Personnel at the Baker Lake Marshalling facility were given an information/training session on how to react to a major spill at the Baker Lake Bulk Fuel Storage & Marshalling Facility in August

2018. Among these personnel were Marshalling Area Supervisors, Warehouse Technicians, Environmental Technicians, and contractors from Intertek. This training was provided by the Environment Department.

A mock spill exercise was completed on September 8th, 2018 at the Baker Lake Marshalling Facility. The scenario was during the Jet A discharge, simulation of a breaking valve in the secondary containment and overflow of the secondary containment. Agnico Eagle's Environmental staff lead the exercise, which included Intetek Contractor staff and Procurement and Logistics department workers, and documented the spill actions. The exercise was used to gain experience on spill intervention and awareness of spill management gear. Overall, the reaction of participants was satisfactory and lessons learned from the event will ensure a more efficient future response, if needed. The mock spill exercise report can by found in Appendix L of the Spill Contingency Plan (Appendix 51).

7.1.1 Meadowbank Site

As per NWB Water License 2AM-MEA1526 Schedule B, Item 13 *A list and description of all unauthorized discharges including volumes, spill report line identification number and summaries of follow-up action taken.*

A summary of all unauthorized discharges that were reported to the GN Spill hotline in 2018 is presented in Table 7.2. A summary of all non-reportable spills can be found in Table 7.3. This data was also included in monthly monitoring reports submitted to the NWB 2AM-MEA1526 and quarterly via the KIA Production Lease Report. GN Spill Reporting Forms and the follow up report as requested by the Water License 2AM-MEA1526 Part H, Item 8 for reported spills are included in Appendix 25. The spills presented in Table 7.2 and 7.3 below only included spill related to the Meadowbank Site, AWAR and Baker Lake infrastructures.

In 2018, twenty-six (26) spills were reported to the GN Spill hotline which is similar to 2017 reporting. Table 7.1 above provide a summary of the spill reportable and non-reportable from 2011 -2018. The number of spill non-reportable in 2018 is significantly lower than the number of non-reportable spills reported in 2017. This decrease is mainly due to the fact that the construction/operation activities at Meadowbank were lower in 2018, i.e. less mining activities.

As per the Spill Contingency Plan, spills are contained and cleaned, contaminated material is disposed to the appropriate area as per the below and the clean-up actions are monitored by the Environment team:

- all contaminated spill pads, and booms used during spill response are placed within Quatrex bags for shipment to an approved disposal facility
- all the petroleum hydrocarbon contaminated soil collected during clean-up is placed into the landfarm for treatment
- spills over 100 L of nonpetroleum hydrocarbon material (e.g. solvents, glycol) will be placed in drums and stored in the on-site hazardous material area for shipment south to approved facilities during barge season.
- spills of non-petroleum hydrocarbon material fewer than 100 L will be placed in the Tailings Storage Facility

- spills fewer than 100 L of petroleum hydrocarbon contaminated snow will be placed in a designated area of the landfarm and treated as contact water after snowmelt

- spills over 100 L of petroleum hydrocarbon contaminated snow will be excavated and stored in labeled drums. All internal reported spills and reported to regulators are managed according to the spill contingency plan

As per KIA's recommendation regarding the 2017 Annual Report, Agnico Eagle will start in 2019 to provide more detail regarding the contaminated material disposal in the monthly, quarterly and annual report. As the comment's on the 2017 Annual Report were received at the end of 2018, the clean-up action taken was not updated to reflect KIA's comments

Table 7.2. 2018 Meadowbank spills reported to the GN 24Hr spill HotLine

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken	Spill Number
January 4, 2018	Hydraulic oil	200	L	Portage pit	Busted hose	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-005
February 6, 2018	Hydraulic oil	100	L	MBK Pushback parking	Leak - Rear wheel seal failed	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-035
February 7, 2018	Hydraulic oil	150	L	Phaser road	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-038
February 12, 2018	Hydraulic oil	200	L	Portage pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-042
February 25, 2018	Hydraulic oil	600	L	Vault	Hydraulic "O" ring failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-055
February 27, 2018	Hydraulic oil	120	L	Phaser pit	Leak from the stick cylinder	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-056
March 12, 2018	Hydraulic oil	250	L	Phaser Pit	Broken "O" ring	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-084
March 16, 2018	Hydraulic oil	200	L	Mine Meadowbank	A rock damaged the hydraulic pump	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-090
March 17, 2018	Hydraulic oil	150	L	Portage Pit	Broken steel pipe on main boom cylinder	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-092
March 31, 2018	Coolant	379	L	Vault RSF	Radiator fan failure broken fan hit the radiator and punctured it	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-109
April 10, 2018	Hydraulic oil	350	L	Vault pit	Hoist cylinder hose busted	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-119
April 20, 2018	Coolant	180	L	Portage Pit	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-130
April 24, 2018	Hydraulic oil	200	L	Portage Pit	Hydraulic "O" ring failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-137
May 1, 2018	Hydraulic oil	350	L	Vault Pit	Major leak	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-146
May 10, 2018	Hydraulic oil	185	L	BB Phaser Pit	Brake line failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-170
May 18, 2018	Coolant	120	L	MBK Portage Pushback	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-181

				parking			
May 28, 2018	Hydraulic oil	150	L	Vault pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-203
June 18, 2018	Hydraulic oil	250	L	MBK Winter parking	Broken seal on a track tensioner cylinder	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-239
July 17, 2018	Hydraulic oil	360	L	Vault pit	Broken hydraulic hose.	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-280
August 9 2018	Oil	130	L	MBK Maintenance Shop	Improper installation of tote suction line	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-318
August 19 2018	Tailings	3,000	L	MBK Saddle dam 4	Draining valve on the tailing line going from pig launcher to booster pump broke off during the night sending a small amount of tailing on top of the dike.	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-353
September 11, 2018	Hydraulic oil	500	L	Vault Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-370
September 24 2018	Diesel	600	L	MBK Maintenance	Feed pipe of the diesel service truck broke during operations.	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-400
September 28 2018	Mill tailings	2,000	L	MBK Saddle Dam 2	Pig stuck in tailing line. The line was broken with air pressure applied to remove the pig	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-405
October 11, 2018	Hydraulic oil	260	L	MBK Portage Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-419
October 14, 2018	Hydraulic oil	500	L	MBK Portage Rock Storage Facility	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-422

Table 7.3. 2018 Meadowbank Non-reportable spills

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
January 2, 2018	Hydraulic oil	10	L	MBK Pushback parking	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 2, 2018	Hydraulic oil	20	L	MBK Lube station	Overfilled. Unclosed valve.	Spill was contained and contaminated soil picked up and disposed of appropriately
January 3, 2018	Hydraulic oil	20	L	Portage pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 4, 2018	Hydraulic oil	54	L	MBK Pushback parking	Busted hose	Spill was contained and contaminated soil picked up and disposed of appropriately
January 5, 2018	Hydraulic oil	10	L	Phaser pit	Busted o'ring	Spill was contained and contaminated soil picked up and disposed of appropriately
January 6, 2018	Hydraulic oil	35	L	MBK Primary crusher	Hydraulic block failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 8, 2018	Hydraulic oil	60	L	Portage pit	Busted hose	Spill was contained and contaminated soil picked up and disposed of appropriately
January 8, 2018	Hydraulic oil	10	L	Vault pit	Broken steel pipe	Spill was contained and contaminated soil picked up and disposed of appropriately
January 8, 2018	Hydraulic oil	70	L	MBK Primary crusher	Broken motor filter	Spill was contained and contaminated soil picked up and disposed of appropriately
January 10, 2018	Coolant	20	L	AWAR (Km 45)	Broken coolant hose	Spill was contained and contaminated soil picked up and disposed of appropriately
January 10, 2018	Hydraulic oil	60	L	Vault Camp	Rear wheel seal failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 11, 2018	Hydraulic oil	40	L	Vault Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 13, 2018	Hydraulic oil	70	L	Phaser Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 13, 2018	Hydraulic oil	20	L	MBK Camp	Discharge hose dropped from the tote to the ground	Spill was contained and contaminated soil picked up and disposed of appropriately

January 15, 2018	Coolant	60	L	MBK Pushback parking	Broken coolant hose	Spill was contained and contaminated soil picked up and disposed of appropriately
January 20, 2018	Compressor oil	50	L	Vault pit	Blown oil cooler	Spill was contained and contaminated soil picked up and disposed of appropriately
January 20, 2018	Hydraulic oil	15	L	Vault parking	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 20, 2018	Coolant	50	L	Portage pit	Blown heater hose	Spill was contained and contaminated soil picked up and disposed of appropriately
January 22, 2018	Hydraulic oil	1	L	MBK Main site	Quick attach hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 23, 2018	Hydraulic oil	80	L	Phaser pit	Broken hydraulic pump	Spill was contained and contaminated soil picked up and disposed of appropriately
January 23, 2018	Steering fluid	5	L	MBK Pushback parking	Busted steering hose	Spill was contained and contaminated soil picked up and disposed of appropriately
January 24, 2018	Hydraulic oil	20	L	Vault pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 24, 2018	Hydraulic oil	5	L	Vault pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 24, 2018	Engine oil	5	L	MBK Pushback parking	Engine oil Hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 24, 2018	Hydraulic oil	20	L	MBK Pushback parking	Busted o-ring on the coolant line	Spill was contained and contaminated soil picked up and disposed of appropriately
January 26, 2018	Hydraulic oil	10	L	Vault parking	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 27, 2018	Hydraulic oil	15	L	Vault camp parking	Busted hydraulic oil hose	Spill was contained and contaminated soil picked up and disposed of appropriately
January 28, 2018	Coolant	5	L	Phaser pit	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 29, 2018	Hydraulic oil	50	L	MBK Tow haul parking lot	Leak, o-ring split	Spill was contained and contaminated soil picked up and disposed of appropriately
February 1, 2018	Coolant	2	L	Vault pit	Loose heater hose	Spill was contained and contaminated soil picked up and disposed of appropriately
February 2, 2018	Diesel	30	L	MBK Service building	Overflow of the fuel tank	Spill was contained and contaminated soil picked up and disposed of appropriately

				parking		
February 4, 2018	Hydraulic oil	20	L	Phaser pattern	Broken o-ring hose	Spill was contained and contaminated soil picked up and disposed of appropriately
February 7, 2018	Hydraulic oil	30	L	MBK Pushback parking	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 9, 2018	Hydraulic oil	70	L	Vault pit	Leak on the traction valve	Spill was contained and contaminated soil picked up and disposed of appropriately
February 9, 2018	Hydraulic oil	30	L	MBK Service building parking	Hose came loose	Spill was contained and contaminated soil picked up and disposed of appropriately
February 10, 2018	Engine oil	10	L	BB Phaser road	Frozen breather	Spill was contained and contaminated soil picked up and disposed of appropriately
February 10, 2018	Hydraulic oil	70	L	Vault parking	Broken brake line	Spill was contained and contaminated soil picked up and disposed of appropriately
February 11, 2018	Hydraulic oil	20	L	Vault parking	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 12, 2018	Diesel	30	L	Vault pit	Leak from a fuel tank plug	Spill was contained and contaminated soil picked up and disposed of appropriately
February 12, 2018	Hydraulic oil	80	L	MBK Portage Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 13, 2018	Fuel	20	L	Phaser pit	Blocked air breather	Spill was contained and contaminated soil picked up and disposed of appropriately
February 13, 2018	Fuel	30	L	Vault pit	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately
February 15, 2018	Engine oil	10	L	Vault pit	Starter gasket failed	Spill was contained and contaminated soil picked up and disposed of appropriately
February 15, 2018	Hydraulic oil	5	L	Vault parking	Steering hose busted	Spill was contained and contaminated soil picked up and disposed of appropriately
February 15, 2018	Hydraulic oil	25	L	Vault parking	Torque plug and wheel seal failed	Spill was contained and contaminated soil picked up and disposed of appropriately
February 15, 2018	Hydraulic oil	20	L	Vault	Blown o-ring on valve	Spill was contained and contaminated soil picked up and disposed of appropriately
February 16, 2018	Fuel	5	L	Phaser pattern	Frozen bleeder valve	Spill was contained and contaminated soil picked up and disposed of appropriately
February 18, 2018	Hydraulic oil	25	L	Vault coverall	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 18, 2018	Hydraulic oil	5	L	Tear drop road area	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately

February 19, 2018	Hydraulic oil	15	L	Vault pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 19, 2018	Hydraulic oil	35	L	Vault coverall	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 19, 2018	Coolant	50	L	Vault	Engine overheat causing overflow	Spill was contained and contaminated soil picked up and disposed of appropriately
February 19, 2018	Hydraulic oil	20	L	Vault parking	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 20, 2018	hydraulic oil	20	L	Vault parking	Bucket cylinders were replaced causing the spill	Spill was contained and contaminated soil picked up and disposed of appropriately
February 20, 2018	Hydraulic oil	40	L	Vault parking	Valve from the tank was not completely close-frozen	Spill was contained and contaminated soil picked up and disposed of appropriately
February 20, 2018	Hydraulic oil	80	L	MBK Stormwater road	Broken hydraulic hose	Spill was contained and contaminated soil picked up and disposed of appropriately
February 22, 2018	Hydraulic oil	30	L	Vault pit	Hole in right boom cylinder	Spill was contained and contaminated soil picked up and disposed of appropriately
February 23, 2018	Hydraulic oil	2	L	Vault parking	Busted hose	Spill was contained and contaminated soil picked up and disposed of appropriately
February 24, 2018	Hydraulic oil	80	L	Vault parking	Wheel seal failed	Spill was contained and contaminated soil picked up and disposed of appropriately
February 25, 2018	Hydraulic oil	50	L	BB Phaser	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 26, 2018	Hydraulic oil	10	L	Portage pit	Hydraulic hose busted	Spill was contained and contaminated soil picked up and disposed of appropriately
February 26, 2018	Hydraulic oil	50	L	BB Phaser	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 27, 2018	Coolant	70	L	Phaser pit	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 28, 2018	Hydraulic oil	30	L	Phaser pit	Hydraulic hose broke	Spill was contained and contaminated soil picked up and disposed of appropriately
February 28, 2018	Hydraulic oil	10	L	Portage Pit	Broken o-ring on hammer	Spill was contained and contaminated soil picked up and disposed of appropriately
March 1, 2018	Hydraulic oil	4	L	Portage Pit	Worn out o-ring	Spill was contained and contaminated soil picked up and disposed of appropriately
March 2, 2018	Hydraulic oil	50	L	Vault Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
March 2,	Coolant	25	L	Site Services	Coolant hose failure	Spill was contained and contaminated soil picked

2018				Meadowbank		up and disposed of appropriately
March 4, 2018	Hydraulic oil	50	L	Auxiliary Equipment Meadowbank	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
March 7, 2018	Hydraulic oil	45	L	MBK Portage RSF	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
March 7, 2018	Hydraulic oil	15	L	Vault Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
March 10, 2018	Transmission fluid	25	L	Vault RSG	Transmission hose leak	Spill was contained and contaminated soil picked up and disposed of appropriately
March 13, 2018	Engine oil	40	L	MBK North Cell TSF	Dipstick tube broke and engine oil overfilled	Spill was contained and contaminated soil picked up and disposed of appropriately
March 13, 2018	Hydraulic oil	45	L	Portage Pit	Bucket cylinder hydraulic line failed	Spill was contained and contaminated soil picked up and disposed of appropriately
March 16, 2018	Coolant	45	L	Vault Parking	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
March 19, 2018	Hydraulic oil	30	L	MBK Pushback parking	Failed torque converter hose	Spill was contained and contaminated soil picked up and disposed of appropriately
March 21, 2018	Coolant	40	L	Vault RSF	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
March 21, 2018	Coolant	30	L	Vault RSF	failed seal on cooler tube	Spill was contained and contaminated soil picked up and disposed of appropriately
March 23, 2018	Hydraulic oil	80	L	Vault Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
March 24, 2018	Hydraulic oil	80	L	Portage Pit	Broken O-ring	Spill was contained and contaminated soil picked up and disposed of appropriately
March 26, 2018	Transmission oil	50	L	MBK Maintenance Shop	Broken cover on transmission filter base	Spill was contained and contaminated soil picked up and disposed of appropriately
March 27, 2018	Hydraulic oil	97	L	BB Phaser Pit	Leaking hose	Spill was contained and contaminated soil picked up and disposed of appropriately
March 27, 2018	Engine oil	45	L	MBK Maintenance Shop	Seal is leaking	Spill was contained and contaminated soil picked up and disposed of appropriately
March 30, 2018	Hydraulic oil	8	L	Vault Parking	Frozen breather	Spill was contained and contaminated soil picked up and disposed of appropriately
April 1, 2018	Coolant	75	L	Vault pit	Failed radiator	Spill was contained and contaminated soil picked up and disposed of appropriately

April 4, 2018	Diesel	35	L	MBK Maintenance shop	Fuel hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
April 4, 2018	Coolant	50	L	Vault Pit	Radiator leak	Spill was contained and contaminated soil picked up and disposed of appropriately
April 5, 2018	Hydraulic oil	30	L	Vault Pit	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately
April 9, 2018	Hydraulic oil	5	L	Phaser Pit	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately
April 10, 2018	Hydraulic oil	20	L	Vault parking	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
April 11, 2018	Hydraulic oil	30	L	MBK Portage RSF	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
April 15, 2018	Steering Fluid	2	L	BL gatehouse	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately
April 16, 2018	Antifreeze	83	L	Vault RSF	Engine fan broke the radiator	Spill was contained and contaminated soil picked up and disposed of appropriately
April 16, 2018	Hydraulic oil	80	L	Portage Pit	Fan motor test port.	Spill was contained and contaminated soil picked up and disposed of appropriately
April 18, 2018	Hydraulic oil	90	L	Portage Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
April 18, 2018	Coolant	80	L	MBK Pushback parking	Radiator leak	Spill was contained and contaminated soil picked up and disposed of appropriately
April 20, 2018	Fuel	30	L	MBK Pushback parking	Overfilling	Spill was contained and contaminated soil picked up and disposed of appropriately
April 20, 2018	Hydraulic oil	70	L	MBK primary crusher	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
April 22, 2018	Coolant	15	L	Vault Pit	Busted hose	Spill was contained and contaminated soil picked up and disposed of appropriately
April 22, 2018	Coolant	60	L	Vault Pit	Leaf spring broke and ripped coolant lines off	Spill was contained and contaminated soil picked up and disposed of appropriately
April 22, 2018	Hydraulic oil	80	L	MBK maintenance shop	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
April 25, 2018	Hydraulic oil	20	L	MBK Pushback parking	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately

April 26, 2018	Hydraulic oil	65	L	Vault Pit	Busted hydraulic hose	Spill was contained and contaminated soil picked up and disposed of appropriately
April 27, 2018	Hydraulic oil	10	L	Vault Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
April 28, 2018	Hydraulic oil	20	L	BB Phaser	Busted hose	Spill was contained and contaminated soil picked up and disposed of appropriately
April 29, 2018	Hydraulic oil	30	L	Phaser Pit	Broken fitting on a hydraulic hose	Spill was contained and contaminated soil picked up and disposed of appropriately
April 30, 2018	Hydraulic oil	15	L	MBK North Cell	Broken hydraulic tilt cylinder hose	Spill was contained and contaminated soil picked up and disposed of appropriately
May 1, 2018	Hydraulic oil	80	L	MBK pushback parking	Rear wheel seal failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 3, 2018	Hydraulic oil	20	L	MBK maintenance shop	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 4, 2018	Hydraulic oil	80	L	Vault Pit	Cylinder failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 4, 2018	Hydraulic oil	5	L	Phaser Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 4, 2018	Coolant	20	L	AWAR KM 85	Heater hose busted	Spill was contained and contaminated soil picked up and disposed of appropriately
May 5, 2018	Hydraulic oil	30	L	MBK maintenance shop	Possible loose valve on oil tote.	Spill was contained and contaminated soil picked up and disposed of appropriately
May 5, 2018	Hydraulic oil	30	L	Vault Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 8, 2018	Coolant	20	L	Vault Parking	Clamp loose on the engine block	Spill was contained and contaminated soil picked up and disposed of appropriately
May 9, 2018	Hydraulic oil	80	L	MBK Stormwater Pond	Hose was being built and tank was not vented therefore pressurized and slowly leaked	Spill was contained and contaminated soil picked up and disposed of appropriately
May 9, 2018	Diesel	80	L	Vault Parking	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately
May 10, 2018	Coolant	20	L	Vault pit parking	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 10, 2018	Hydraulic oil	20	L	MBK crusher pad	Crack in boom cylinder	Spill was contained and contaminated soil picked up and disposed of appropriately

May 11, 2018	Hydraulic oil	20	L	Vault pit parking	Brake line failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 12, 2018	Hydraulic oil	20	L	MBK old SANA crusher pad	Fitting hydraulic oil failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 13, 2018	Coolant	10	L	Vault pit parking	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 14, 2018	Hydraulic oil	20	L	Portage Pit	Steering hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 14, 2018	Hydraulic oil	10	L	MBK Central dike	Fitting hydraulic oil failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 17, 2018	Hydraulic oil	10	L	MBK North Cell	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 18, 2018	Hydraulic oil	20	L	Phaser Pit	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately
May 21, 2018	Hydraulic oil	20	L	MBK SANA crusher pad	Broken seal on main hydraulic pump	Spill was contained and contaminated soil picked up and disposed of appropriately
May 26, 2018	Hydraulic oil	85	L	BB Phaser Pit	Busted hose	Spill was contained and contaminated soil picked up and disposed of appropriately
May 26, 2018	Hydraulic oil	60	L	Vault Parking	Leaking hose	Spill was contained and contaminated soil picked up and disposed of appropriately
May 28, 2018	Hydraulic oil	50	L	Vault Pit	Hydraulic leak	Spill was contained and contaminated soil picked up and disposed of appropriately
May 31, 2018	Coolant	80	L	Vault Parking	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 2, 2018	Hydraulic oil	50	L	Vault RSF	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 3, 2018	Coolant	25	L	Vault parking	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 3, 2018	Transmission oil	10	L	MBK Lube station	Spills starting to show up from spring thaw - Leak	Spill was contained and contaminated soil picked up and disposed of appropriately
June 4, 2018	Hydraulic oil	20	L	Phaser Pit	O-ring failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 4, 2018	Coolant	70	L	MBK Crusher pad	Contact between to heavy equipment causing damage to the radiator	Spill was contained and contaminated soil picked up and disposed of appropriately
June 7, 2018	Hydraulic oil	10	L	Vault pit	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately
June 7,	Hydraulic oil	30	L	Vault pit	Oil coming from the boom	Spill was contained and contaminated soil picked

2018					cylinder	up and disposed of appropriately
June 8, 2018	Hydraulic oil	40	L	Phaser Pit	O-ring failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 8, 2018	Diesel	5	L	Portage Pit	Breather overflowed	Spill was contained and contaminated soil picked up and disposed of appropriately
June 8, 2018	Diesel	30	L	Phaser Pit	Leaking from the fuel plug	Spill was contained and contaminated soil picked up and disposed of appropriately
June 8, 2018	Diesel	5	L	Portage Pit	Breather overflowed during refueling	Spill was contained and contaminated soil picked up and disposed of appropriately
June 9, 2018	Hydraulic oil	60	L	Phaser Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 9, 2018	Diesel	50	L	Portage Pit	Breather overflowed during refueling	Spill was contained and contaminated soil picked up and disposed of appropriately
June 11, 2018	Hydraulic oil	10	L	Vault Pit	Hose connexion failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 14, 2018	Hydraulic oil	50	L	Portage pushback parking	Hydraulic pump leaking causing an overflow	Spill was contained and contaminated soil picked up and disposed of appropriately
June 15, 2018	Hydraulic oil	10	L	Vault Pit	Quick attach hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 15, 2018	Hydraulic oil	65	L	Portage Pit Dump	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 15, 2018	Hydraulic oil	80	L	Portage Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 16, 2018	Hydraulic oil	10	L	Vault parking	Steering hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 16, 2018	Hydraulic oil	80	L	Vault Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 17, 2018	Hydraulic oil	25	L	Vault pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 18, 2018	Hydraulic oil	30	L	Vault pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 22, 2018	Hydraulic oil	50	L	Goose Pit	Residual oil from maintenance repairs	Spill was contained and contaminated soil picked up and disposed of appropriately
June 25, 2018	Coolant	65	L	Vault camp	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 28, 2018	Coolant	25	L	Phaser pit	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 1,	Hydraulic oil	85	L	Vault pit	Hydraulic hose failure	Spill was contained and contaminated soil picked

2018						up and disposed of appropriately
July 12, 2018	Motor Oil	15	L	Maintenance Meadowbank	Leak from pick up engine	Spill was contained and contaminated soil picked up and disposed of appropriately
July 14, 2018	Hydraulic oil	20	L	Mine Meadowbank - Pit E5	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 21, 2018	Hydraulic oil	10	L	Mine Meadowbank - Pit E5	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 22, 2018	Hydraulic oil	40	L	Vault pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 27, 2018	Coolant	20	L	Meadowbank Portage RSF	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
August 5 2018	Compressor Oil	0.5	L	MBK Process Plant	Compressor carter failure	Spill was contained and contaminated soil picked up and disposed of appropriately
August 6 2018	Engine oil	15	L	MBK Maintenance	Improper disposal	Spill was contained and contaminated soil picked up and disposed of appropriately
August 10 2018	Hydraulic oil	40	L	Vault road - front of kitchen	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
August 10 2018	Hydraulic oil	4	L	MBK Iron pad	Mechanical failure on equipment	Spill was contained and contaminated soil picked up and disposed of appropriately
August 12 2018	Hydraulic oil	15	L	MBK Bay 8 (Truck shop)	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
August 19 2018	Hydraulic oil	10	L	Vault Parking	O-ring failure	Spill was contained and contaminated soil picked up and disposed of appropriately
August 20 2018	Hydraulic oil	95	L	MBK Primary Crusher	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
August 29 2018	Diesel	30	L	Baker Lake Tank Farm	Truck driver forgot to unhook the loading arm before leaving the tank farm and broke the arm	Spill was contained and contaminated soil picked up and disposed of appropriately
August 29 2018	Hydraulic oil	10	L	MBK Pushback parking	Hydraulic Tank Overflow	Spill was contained and contaminated soil picked up and disposed of appropriately
August 30 2018	Hydraulic oil	95	L	Vault Ramp	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
August 31	Coolant	70	L	Vault Kitchen	Coolant hose failure	Spill was contained and contaminated soil picked

2018				Parking		up and disposed of appropriately
August 31 2018	Diesel	15	L	BB Phaser Ramp	Tank vent broke while refueling	Spill was contained and contaminated soil picked up and disposed of appropriately
September 1, 2018	Hydraulic oil	70	L	Vault pit	Pressure gauge failure on the grease system	Spill was contained and contaminated soil picked up and disposed of appropriately
September 2, 2018	Hydraulic oil	5	L	MBK Pit E	O-ring failure	Spill was contained and contaminated soil picked up and disposed of appropriately
September 4, 2018	Hydraulic oil	30	L	MBK Pit E5	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
September 12, 2018	Compressor oil	30	L	Portage Pit	Compressor seal failure	Spill was contained and contaminated soil picked up and disposed of appropriately
September 18 2018	Coolant	30	L	MBK Pit E	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
September 19 2018	Coolant	40	L	MBK Primary crusher	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
September 22 2018	Hydraulic oil	70	L	BB Phaser Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
September 27, 2018	Hydraulic oil	10	L	MBK Washroom Portage	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 4, 2018	Hydraulic oil	40	L	MBK Portage Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 5, 2018	Coolant	50	L	MBK Push back parking	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 9, 2018	Hydraulic oil	80	L	Vault	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 10, 2018	Hydraulic oil	25	L	MBK Portage Pit	Hydraulic hose failure during trimming	Spill was contained and contaminated soil picked up and disposed of appropriately
October 10, 2018	Hydraulic oil	25	L	MBK Portage Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 15, 2018	Coolant	12	L	MBK Row #1 Inventory seacan pad	Radiator failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 21, 2018	Hydraulic oil	85	L	MBK Primary crusher	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 21, 2018	Hydraulic oil	10	L	Vault Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately

October 26, 2018	Coolant	30	L	MBK Genset units	The electrician was going around the genset units for his inspections when he noticed a coolant spill on the ground beside the berm under the radiator unit	Spill was contained and contaminated soil picked up and disposed of appropriately
October 30, 2018	Hydraulic oil	40	L	MBK Dome	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
November 5, 2018	Diesel	40	L	MBK Refuelling station	Fuel nozzle valve was open. When the operator placed the fuel tree over the truck and started the pump some fuel spilled to the ground	Spill was contained and contaminated soil picked up and disposed of appropriately
November 7, 2018	Coolant	10	L	Vault Rock Storage Facility	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
November 7, 2018	Waste Water	15	L	MBK Behind medical clinic	Sewage pipe was frozen. Opened a flange on the pipe and there was some left in.	Spill was contained and contaminated soil picked up and disposed of appropriately
November 7, 2018	Transmission Fluid	10	L	Phaser Dump	Dozer transmission broke down	Spill was contained and contaminated soil picked up and disposed of appropriately
November 17, 2018	Coolant	25	L	Portage parking	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
November 23, 2018	Hydraulic oil	10	L	MBK Site Service coverall	Hydraulic fitting failure	Spill was contained and contaminated soil picked up and disposed of appropriately
November 24, 2018	Coolant	10	L	MBK Dispatch parking	Water pump failure	Spill was contained and contaminated soil picked up and disposed of appropriately
November 26, 2018	Diesel	4	L	Portage Pit	Fuel Tank Breather was defective and did not stop the automatic shut off on the fuel nozzle on the fuel truck	Spill was contained and contaminated soil picked up and disposed of appropriately
November 27, 2018	Hydraulic oil	40	L	MBK Primary crusher pad	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
November	Diesel	20	L	MBK South	Tank ventilation failure	Spill was contained and contaminated soil picked

28, 2018				Pit		up and disposed of appropriately
December 2, 2018	Diesel	10	L	Meadowbank Pushback parking	Frozen fuel breather	Spill was contained and contaminated soil picked up and disposed of appropriately
December 4, 2018	Hydraulic Oil	20	L	Vault Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 7, 2018	Hydraulic Oil	75	L	Vault parking	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 12, 2018	Coolant	95	L	Meadowbank E3 ramp	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 13, 2018	Hydraulic Oil	45	L	Vault Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 17, 2018	Hydraulic Oil	85	L	BB Phaser Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 21, 2018	Hydraulic Oil	15	L	Portage Pit E	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 21, 2018	Hydraulic Oil	5	L	Portage Pit E	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 21, 2018	Hydraulic Oil	5	L	Meadowbank Pit	O-ring failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 22, 2018	Hydraulic Oil	5	L	Vault pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 23, 2018	Hydraulic Oil	20	L	Portage Pit E	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 26, 2018	Hydraulic Oil	6	L	Meadowbank Maintenance Shop	Hydraulic tank gasket failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 27, 2018	Coolant	20	L	Vault parking	Engine cooling system hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 27, 2018	Steering Fluid	4	L	Vault parking	Steering hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 30, 2018	Coolant	90	L	Meadowbank Pushback parking	Equipment failure	Spill was contained and contaminated soil picked up and disposed of appropriately

7.1.2 Whale Tail Site

As per NWB Water License 2AM-WTP1826 Schedule B, Item 13: ***A list and description of all unauthorized discharges including volumes, spill report line identification number and summaries of follow-up action taken.***

A summary of all unauthorized discharges that were reported to the GN Spill hotline in 2018 is presented in Table 7.4. A summary of all non-reportable spills can be found in Table 7.5. This data was also included in monthly monitoring reports submitted to the NWB 2AM-WTP1826. Starting 2019, the spills will also be reported quarterly via the KIA Production Lease Report. GN Spill Reporting Forms and the follow up report as requested by the Water License 2AM-WTP1826 Part H, Item 8 for reported spills are included in Appendix 26. The spills presented in Table 7.4 and 7.5 below only included spill related to the Whale Tail Site and Whale Tail Haul Road.

In 2018, fifteen (15) spills were reported to the GN Spill hotline and 114 non-reportable spills. There is a significant increase from previous year (2016-2017) due the higher activity with the construction of the Whale Tail Site. Table 7.1 above provide a summary of the spill reportable and non-reportable from 2016 -2018.

As per the Spill Contingency Plan, spills are contained and cleaned, contaminated material is disposed to the appropriate area, such as the Meadowbank landfarm and the clean-up actions are monitored by the Environment team. Please refer to Section 7.1.1. All non-petroleum hydrocarbon and hydrocarbon material from Whale Tail site are shipped to Meadowbank for adequate disposal.

Table 7.4. 2018 Whale Tail spills reported to the GN 24Hr spill HotLine

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken	Spill Number
January 29, 2018	Fecal coliform	3,000	CFU/100 ml	WT Waste water treatment system	A faulty UV system could have led to this exceedance.	The faulty UV system has been replaced	2018-030
May 7, 2018	Waste water (sewage)	30	m^3	WT Wing 16, 17, 18	3 inch waste water pipe rupture	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-160
May 8, 2018	Hydraulic oil	130	L	WT Pad C	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-161
May 8, 2018	Diesel	100	L	WT Fuel Farm	Omitting to open a fuel compartment trap while transferring fuel	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-162
May 14, 2018	Treated waste water – oil and grease	29	mg/L	WT Waste WTP outlet	Exceeding oil and grease criteria results. The exceedance may be due to a fault of the kitchen grease trap system.	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-215
May 25, 2018	Hydraulic oil	200	L	WT Road 15	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-196
June 11, 2018	Diesel	115	L	WT Orbit Garant dry	Perforated tote during fuel transfer	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-219
July 31, 2018	Hydraulic oil	180	L	Amaruq Sana crusher area	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-305
August 8 2018	Waste water	1,400	L	Amaruq Sewage Treatment Plant	Waste water spill at the Newterra sewage treatment plant due to a 4 inch pipe located at the bottom of the tank letting go due to the securing mechanical coupling breaking off.	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-316
August 10 2018	Hydraulic oil	146	L	Amaruq Road Km 32	Broken Filter	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-321

September 30 2018	Hydraulic oil	160	L	Amaruq Road Km 42	Pump to filter hose pin holed	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-410
September 30 2018	Diesel	100	L	Amaruq Road KM 51	A tractor-trailer rolled-off the Whale Tail road at km 51.	On location, diesel fuel was found to be leaking from the cap of the tractor diesel tanks. Spill was contained and contaminated soil will be picked up and disposed of appropriately	2018-404
September 30 2018	Diesel	120	L	Amaruq Road Quarry 35	Lose solenoid on top of the hydraulic pump	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-404
October 17, 2018	Raw sewage	200	L	Amaruq Newterra STP	The malfunction of the raw sewage tank #203 water pump float created an overflow of the tank into the seacan and spilled onto the ground next to it.	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-425
November 12, 2018	Diesel	250	L	Whale Tail fuel farm tank 103	No dip test before unloading the fuel	Spill was contained and contaminated soil picked up and disposed of appropriately	2018-450

Table 7.5. 2018 Whale Tail Non-reportable spills

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
January 5, 2018	Engine oil	2	L	WT Camp main entrance area	Engine oil leak	Spill was contained and contaminated soil picked up and disposed of appropriately
January 5, 2018	Diesel fuel	5	L	WT Fuel farm	Leaking valves	Spill was contained and contaminated soil picked up and disposed of appropriately
January 5, 2018	Hydraulic oil	40	L	WT Service building	Leaks	Spill was contained and contaminated soil picked up and disposed of appropriately
January 9, 2018	Hydraulic oil	5	L	WT Service building	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 15, 2018	Engine oil	8	L	WT Garage	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately
January 15, 2018	Hydraulic oil	2	L	WT AP-5	Hose leak	Spill was contained and contaminated soil picked up and disposed of appropriately

January 18, 2018	Coolant	60	L	WT Quarry #1	Broken hose collar	Spill was contained and contaminated soil picked up and disposed of appropriately
January 19, 2018	Diesel fuel	20	L	WT Pad C 849	Overfilled. Frozen fuel tank vent.	Spill was contained and contaminated soil picked up and disposed of appropriately
January 21, 2018	Engine oil	1	L	WT Core shack parking lot	Frozen air breather causing pressure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 22, 2018	Diesel	1	L	WT Fuel station	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately
January 23, 2018	Hydraulic oil	75	L	WT Box cut	Oil filter damaged by a small rock	Spill was contained and contaminated soil picked up and disposed of appropriately
January 24, 2018	Motor oil	3	L	WT Agnico Garage Parking	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately
January 25, 2018	Hydraulic oil	20	L	Amaruq road (km 15)	Mechanical failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 27, 2018	Coolant	5	L	WT Service building Genset area	Heating up of the Genset's gaskets and seals which lead them to expand	Spill was contained and contaminated soil picked up and disposed of appropriately
January 27, 2018	Hydraulic oil	75	L	WT Electrical trench	Loose excavator's hydraulic filter and fail under pressure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 4, 2018	Hydraulic oil	3	L	WT Road Esker 7	Leak on the hydraulic line quick attach	Spill was contained and contaminated soil picked up and disposed of appropriately
February 4, 2018	Hydraulic oil	3	L	WT Wing 6	Leak on the hydraulic line quick attach	Spill was contained and contaminated soil picked up and disposed of appropriately
February 5, 2018	Engine oil	0.5	L	WT Service building	The throttle was too low, the breather plugged and the oil goes out by the oil gauge.	Spill was contained and contaminated soil picked up and disposed of appropriately
February 7, 2018	Diesel Fuel	4	L	WT South side of Orbit Garant	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately
February 11, 2018	Hydraulic oil	89	L	WT Quarry 1	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 19, 2018	hydraulic oil	9	L	WT Quarry 1	Body valve leaking	Spill was contained and contaminated soil picked up and disposed of appropriately
February 20, 2018	Hydraulic oil	10	L	WT Pad C	Leak from the ripper hose	Spill was contained and contaminated soil picked up and disposed of appropriately
February 20, 2018	Hydraulic oil	90	L	WT Quarry 1	Busted o ring on the bucket cylinder	Spill was contained and contaminated soil picked up and disposed of appropriately

February 21, 2018	Diesel	1	L	WT Agnico Garage	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately
March 3, 2018	Hydraulic oil	10	L	WT Quarry 1	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
March 8, 2018	Diesel fuel	1	L	WT Fuel Farm	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately
March 11, 2018	Hydraulic oil	3	L	WT beside kitchen	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
March 15, 2018	Coolant	3	L	WT beside kitchen	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
March 18, 2018	Hydraulic oil	3	L	WT Road KM 63,5	Hydraulic hose leak	Spill was contained and contaminated soil picked up and disposed of appropriately
April 11, 2018	Diesel fuel	20	L	WT Fuel farm	Overfilling	Spill was contained and contaminated soil picked up and disposed of appropriately
April 12, 2018	Coolant	8	L	WT Quarry 1	Defective radiator cap	Spill was contained and contaminated soil picked up and disposed of appropriately
April 26, 2018	Transmission oil	40	L	WT west side of airstrip	Rock broke the transmission panel	Spill was contained and contaminated soil picked up and disposed of appropriately
May 1, 2018	Diesel fuel	20	L	WT Service building	Overfilling	Spill was contained and contaminated soil picked up and disposed of appropriately
May 3, 2018	Hydraulic oil	10	L	WT road km 7,5	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 3, 2018	Hydraulic oil	10	L	WT Maintenance shop	Leak from a hose.	Spill was contained and contaminated soil picked up and disposed of appropriately
May 6, 2018	Engine oil	4	L	WT AP5	Oil Filter became loose and oil spilled	Spill was contained and contaminated soil picked up and disposed of appropriately
May 6, 2018	Coolant	1	L	WT Agnico garage	Loose coolant filter	Spill was contained and contaminated soil picked up and disposed of appropriately
May 6, 2018	Coolant	12	L	WT Pad H	Hose rupture	Spill was contained and contaminated soil picked up and disposed of appropriately
May 7, 2018	Hydraulic oil	3	L	WT Pad C	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 8, 2018	Coolant	6	L	WT AP5	Leak from the radiator cap	Spill was contained and contaminated soil picked up and disposed of appropriately
June 3, 2018	Diesel	30	L	WT Road 3	Overfilling	Spill was contained and contaminated soil picked up and disposed of appropriately
June 6, 2018	Coolant	5	L	WT Road KM10	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately

June 11, 2018	Hydraulic oil	2	L	WT Pad H	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately
June 28, 2018	Hydraulic oil	5	L	WT Maintenance shop	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 28, 2018	Hydraulic oil	1	L	WT Pad H	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 5, 2018	Hydraulic oil	10	L	Construction - Amaruq / Esker 7	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 6, 2018	Hydraulic oil	20	L	Amaruq Road - Quarry 26	Inadequate storage	Spill was contained and contaminated soil picked up and disposed of appropriately
July 7, 2018	Hydraulic oil	20	L	Amaruq Road - Quarry 26	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 7, 2018	Coolant	10	L	Amaruq Road - Quarry 17	Radiator hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 8, 2018	Coolant	20	L	Amaruq Road - Quarry 22	Breakage on the radiator	Spill was contained and contaminated soil picked up and disposed of appropriately
July 8, 2018	Hydraulic oil	30	L	Construction - Amaruq - Pad C	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 10, 2018	Coolant	5	L	Construction - Amaruq / Quarry 1	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 10, 2018	Diesel	10	L	Construction - Amaruq - Road 3	Overfilling	Spill was contained and contaminated soil picked up and disposed of appropriately
July 15, 2018	Hydraulic oil	2	L	Amaruq Maintenance shop	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 16, 2018	Transmission oil	95	L	Amaruq / Quarry 1	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 16, 2018	Transmission oil	95	L	WT Quarry 1	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 18, 2018	Hydraulic oil	95	L	Amaruq road	Broken hydraulic hose	Spill was contained and contaminated soil picked up and disposed of appropriately
July 21, 2018	Hydraulic oil	83	L	Construction - Amaruq / Quarry	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately

July 21, 2018	Hydraulic oil	83	L	Construction - Amaruq / Quarry 1	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 22, 2018	Hydraulic oil	45	L	Amaruq Road	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 23, 2018	Hydraulic oil	10	L	Construction - Amaruq / Quarry	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 27, 2018	Transmission oil	50	L	Construction - Amaruq / Pad C	Transmission hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 29, 2018	Sewage	60	L	Construction - Amaruq / STP	STP plugged screener	Spill was contained and contaminated soil picked up and disposed of appropriately
July 31, 2018	Diesel	20	L	Construction - Amaruq Pad Q	Fuel breather malfunction during fueling	Spill was contained and contaminated soil picked up and disposed of appropriately
August 1 2018	Transmission oil	50	L	Amaruq Road KM 29,5	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
August 5 2018	Transmission oil	95	L	Amaruq Quarry Ext	Transmission oil pan failure	Spill was contained and contaminated soil picked up and disposed of appropriately
August 5 2018	Waste water	60	L	Amaruq Lift station Wing 9	Broken pipe	Spill was contained and contaminated soil picked up and disposed of appropriately
August 5 2018	Hydraulic oil	30	L	Amaruq Quarry KM 30	Hydraulic hose failure	spill was contained and contaminated soil picked up and disposed of appropriately
August 7 2018	Glycol	2	L	Amaruq Quarry Ext	Water pump failure on Loader	Spill was contained and contaminated soil picked up and disposed of appropriately
August 7 2018	Engine oil	5	L	Amaruq Maintenance Shop	Overfilled Tote during transportation	Spill was contained and contaminated soil picked up and disposed of appropriately
August 12 2018	Hydraulic oil	20	L	Amaruq Road KM 30.5	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
August 13 2018	Coolant	10	L	Amaruq Pad G	O-ring failure	Spill was contained and contaminated soil picked up and disposed of appropriately
August 13 2018	Transmission oil	90	L	Amaruq Road Km 30.3	Transmission oil filter failure	Spill was contained and contaminated soil picked up and disposed of appropriately
August 27 2018	Diesel	40	L	Amaruq Pad G	Fuel Tank drain valve leak	Spill was contained and contaminated soil picked up and disposed of appropriately
August 30 2018	Hydraulic oil	90	L	Amaruq Road 8 Waste Dump	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
August 31	Hydraulic oil	10	L	Amaruq Road	Hydraulic hose failure	Spill was contained and contaminated soil picked

2018				KM 49		up and disposed of appropriately
September 10, 2018	Coolant	15	L	Amaruq Road Quarry 35	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
September 14 2018	Glycol	80	L	Amaruq Pad C	Glycol pump failure	Spill was contained and contaminated soil picked up and disposed of appropriately
September 22 2018	Hydraulic oil	20	L	Amaruq Pad G	Unknown	Spill was contained and contaminated soil picked up and disposed of appropriately
September 28 2018	Coolant	20	L	Amaruq Pad D	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
September 30 2018	Hydraulic oil	5	L	Amaruq Waste Dump	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
September 30 2018	Coolant	20	L	Amaruq Pad D	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 1, 2018	Coolant	20	L	Amaruq Pad D	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 2, 2018	Coolant	5	L	Amaruq Maintenance Shop	During reparation	Spill was contained and contaminated soil picked up and disposed of appropriately
October 10, 2018	Engine oil	1	L	Amaruq Construction Office	Filter failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 11, 2018	Hydraulic oil	20	L	Amaruq Road Esker 3	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 11, 2018	Hydraulic oil	5	L	Amaruq Whale Tail Dike	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 12, 2018	Coolant	60	L	Amaruq Road Quarry 35	Engine coolant leak	Spill was contained and contaminated soil picked up and disposed of appropriately
October 12, 2018	Diesel fuel	0.5	L	Amaruq Fuel farm	During refueling, the nozzle did not trigger at the end and fuel leaked by the hole.	Spill was contained and contaminated soil picked up and disposed of appropriately
October 14, 2018	Glycol	20	L	Amaruq Pad Q	O-ring failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 17, 2018	Coolant	2	L	Amaruq Fuel farm	When the operator approached his loader that had been parked near the fuel farm, he noticed a leak coming from under the engine.	Spill was contained and contaminated soil picked up and disposed of appropriately

October 24, 2018	Hydraulic oil	20	L	Amaruq Road KM 56	Steering hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 27, 2018	Hydraulic oil	5	L	Amaruq Nemo pad	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 27, 2018	Hydraulic oil	9	L	Amaruq Road Communication Tower	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
October 29, 2018	Diesel	30	L	Amaruq Whale Tail Dike	While filling the air compressor, the nozzle did not disengaged properly when the tank came full, the operator was close and stop the leak immediately.	Spill was contained and contaminated soil picked up and disposed of appropriately
October 31, 2018	Coolant	6	L	Amaruq Pad H	Equipment failure	Spill was contained and contaminated soil picked up and disposed of appropriately
November 1, 2018	Hydraulic oil	10	L	Whale Tail Drill Site AMQ-18-1920	Foot Clamp failure on drill	Spill was contained and contaminated soil picked up and disposed of appropriately
November 2, 2018	Hydraulic oil	3	L	Whale Tail dike	Broken fitting on the quick attach of the loader.	Spill was contained and contaminated soil picked up and disposed of appropriately
November 2, 2018	Coolant	20	L	Whale Tail pit Road 3	O-ring busted on the coolant pipe	Spill was contained and contaminated soil picked up and disposed of appropriately
November 10, 2018	Hydraulic Oil	20	L	Whale Tail PAG dump	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
November 14, 2018	Hydraulic Oil	3	L	Whale Tail Pad H	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
November 16, 2018	Coolant	5	L	Whale Tail Road KM 15	Engine overheated because of a broken fan belt	Spill was contained and contaminated soil picked up and disposed of appropriately
November 17, 2018	Engine Oil	5	L	Whale Tail Maintenance Shop	Engine failure	Spill was contained and contaminated soil picked up and disposed of appropriately
November 18, 2018	Engine Oil	2.5	L	Whale Tail Dike	engine failure du to breather frozen	Spill was contained and contaminated soil picked up and disposed of appropriately
November 19, 2018	Hydraulic Oil	10	L	Whale Tail Dike	Hydraulic fitting loose	Spill was contained and contaminated soil picked up and disposed of appropriately
November 23, 2018	Glycol & engine oil	5	L	Whale Tail Maintenance shop	Engine failure	Spill was contained and contaminated soil picked up and disposed of appropriately

November 28, 2018	Hydraulic Oil	90	L	Whale Tail Quarry 2	Drill failure	Spill was contained and contaminated soil picked up and disposed of appropriately
November 29, 2018	Diesel	20	L	Whale Tail dike	Fuel hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 7, 2018	Hydraulic Oil	20	L	Whale Tail Quarry 2	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 19, 2018	Coolant	15	L	Whale Tail PAD H	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 21, 2018	Hydraulic Oil	60	L	Whale Tail Sana crusher	When draining a hydraulic oil tank, wrong size of funnel and buckets were used to collect the used hydraulic oil	Spill was contained and contaminated soil picked up and disposed of appropriately
December 21, 2018	Transmission Fluid	10	L	Whale Tail Rock Storage Facility	Equipment failure	Spill was contained and contaminated soil picked up and disposed of appropriately
December 30, 2018	Sewage	25	L	Whale Tail Sanitary block	We had to Employee had to unfledged the pipe to pass the steamer - the pipe vertical section emptied on the snow	Spill was contained and contaminated soil picked up and disposed of appropriately

7.2 LANDFARM MEADOWBANK

Meadowbank's first landfarm (Landfarm 1) is located on the north-west side of the South Tailings Cell (Tailing Storage Facility; TSF). The South Tailings Cell is currently active; tailings are deposited and water is reclaimed from the cell. The tailings and water level in the South Tailings Cell are increasing in elevation over time, and eventually Landfarm 1 will become flooded with reclaim water. For this reason, Agnico decided to find an alternate location for a new landfarm (Landfarm 2), in order to continue the treatment of contaminated soil. Landfarm 2 was constructed in 2016, and contaminated soil was added 2017 and 2018.

In 2018, Landfarm 1 was flooded within the TSF and is not active anymore. Therefore for simplicity and clarity, Landfarm will be used moving ahead. This refers specifically to Landfarm 2. Please refer to Appendix F3 for more detailed information.

It is estimated that 986 m^3 of soil were added to Landfarm from excavation of spills around the Meadowbank and Whale Tail sites in 2018. Refer to Appendix 27, "2018 Landfarm Report", for more details. No soil sampling was conducted in 2018, and no material was removed from the landfarm. A summary of historical sample results for years in which sampling was conducted (2014 – 2016) is provided in Table 7.6. No fine material was sampled in 2017 and 2018. Since landfarm additions and removals occurred each year, piles were mixed, and sampling locations are not consistent, year-over-year trends were not assessed.

Visual inspections (34 times) indicated that the landfarm 2 berm and pad appear to be structurally intact, and no maintenance requirements were identified.

Some runoff water was observed within the landfarm in June only, but was insufficient to sample, and was directed towards the adjacent TSF. No seepage outside the landfarm was identified.

NRC conducted chemical and microbiological analyses of soil samples from the landfarm in October, 2017. Recommendations for enhancing biodegradation rates were made (specific nutrient amendment) which are planned for 2019. A sampling campaign is planned in 2019 to further assess degradation rates.

The majority of material deposited in the Landfarm was generated through the clean-up of spills at the Meadowbank and Whale Tail site with additional material generated from spills occurring in Baker Lake locations and along the AWAR. A summary of spills occurring in 2018 including those sent to the landfarm are provided in Table 7.2 to 7.5.

Sewage sludge continues to be used in the landfarm as a soil amendment. No sewage sludge was added to all piles as a nutrient amendment in 2018.

Table 7.6. Meadowbank Landfarm historical PHC degradation 2014 – 2016. Government of Nunavut soil quality criteria for agricultural/wildlands and industrial areas, and results of landfarm soil analyses. *Sample locations do not necessarily correspond year-over-year. Samples exceeding GN Agricultural/Wildland criteria are shaded grey.

Year	Sample Name*	Parameter							
		Benzene	Toluene	Ethylbenzene	Xylene	F1	F2	F3	F4
Agricultural/ Wildland (mg/kg)>		0.03	0.37	0.082	11	30	150	300	2800
Industrial (mg/kg) >		0.03	0.37	0.082	11	320	260	1700	3300
2014	CSP-1A	-	-	-	-	<0.06	900	3500	650
	CSP-1B	-	-	-	-	<0.06	380	2200	460
	CSP-STP-2A	-	-	-	-	<0.06	590	2200	6400
	CSP-STP-2B	-	-	-	-	<0.06	450	2300	6600
	CSP-3	-	-	-	-	<0.06	25	110	<50
	CSP-4A	-	-	-	-	<0.06	480	3300	520
	CSP-4B	-	-	-	-	<0.06	51	1100	210
	CSP-5A	-	-	-	-	<0.06	51	2500	550
	CSP-5B	-	-	-	-	<0.06	460	5100	1000
	CSP-5C	-	-	-	-	<0.06	130	2100	540
	CSP-5D	-	-	-	-	<0.06	38	1400	360
	CSP-5E	-	-	-	-	<0.06	61	1900	450
	CSP-6	-	-	-	-	0.22	2300	610	57
	Average						**455**	**2178**	**1483**
2015	CSP-1a	<0.03	<0.06	<0.06	<0.06	<0.3	600	3200	490
	CSP-1b	<0.03	<0.06	<0.06	<0.06	<0.3	350	2300	380
	CSP-2a	<0.03	<0.06	<0.06	<0.06	<0.3	810	6200	2400
	CSP-2b	<0.03	<0.06	<0.06	<0.06	<0.3	5600	20000	3100
	CSP-3a	<0.03	<0.06	<0.06	<0.06	<0.3	670	4200	490
	CSP-3b	<0.03	<0.06	<0.06	<0.06	<0.3	920	3500	530
	CSP-4	<0.03	<0.06	<0.06	<0.06	<0.3	840	320	<50
	CSP-5a	<0.03	<0.06	<0.06	<0.06	<0.3	260	5200	720
	CSP-5b	<0.03	<0.06	<0.06	<0.06	<0.3	2000	13000	1600
	CSP-5c	<0.03	<0.06	<0.06	<0.06	<0.3	38	1500	350
	CSP-5d	<0.03	<0.06	<0.06	<0.06	<0.3	640	7300	1600
	CSP-6a	<0.03	<0.06	<0.06	<0.06	<0.3	<10	620	79
	CSP-6b	<0.03	<0.06	<0.06	<0.06	<0.3	200	1200	200
	Average						**1052**	**5496**	**1057**
2016	CSP-1a	<0.03	<0.06	<0.06	<0.06	<0.3	350	3000	530

Year	Sample Name*	Parameter							
		Benzene	Toluene	Ethylbenzene	Xylene	F1	F2	F3	F4
	CSP-1b	<0.03	<0.06	<0.06	<0.06	<0.3	240	2400	490
	CSP-1c	<0.03	<0.06	<0.06	<0.06	<0.3	840	5400	930
	CSP-2a	<0.03	<0.06	<0.06	<0.06	<0.3	470	3000	560
	CSP-2b	<0.03	<0.06	<0.06	<0.06	<0.3	560	5800	1200
	CSP-2c	<0.03	<0.06	<0.06	<0.06	<0.3	240	2200	400
	Average						**450**	**3633**	**685**

As per CIRNAC recommendation regarding the 2017 Annual Report: 'provide the civil design report and as built drawings for Landfarm 2, along with the Landfarm Management Plan to clarify water management facilities and procedures at Landfarm 2. Agnico resubmitted the As-built for Landfarm 2. The As-built was originally provided to NWB on November 18, 2016 and submitted as part of the 2016 Annual Report. Agnico will refer you the Appendix 28 of the 2018 Annual Report and the Landfarm Management Plan in Appendix 51.

7.3 POSSIBLE ACCIDENT AND MALFUCTION MEADOWBANK SITE

As required by NIRB Project Certificate No.004 Condition 75: ***provide a complete list of possible accidents and malfunctions for the Project; it must consider the all-weather road, shipping spills, cyanide and other hazardous material spills, and pitwall/dikes /dam failure, and include an assessment of the accident risk and mitigation developed in consultation with Elders and potentially affected communities***

A list of possible accidents and malfunctions are included in the following Meadowbank Gold Project management plans provided in Appendix I1 of the 2017 annual report and Appendix 51 of the 2018 Annual Report:

- *Hazardous Materials Management Plan, v4, March 2019;*
- *Spill Contingency Plan, v7, February 2019;*
- *Emergency Response Plan, v12, January 2018;*
- *Oil Pollution Emergency Plan v9, June 2018;*
- *OMS Manual for TSF v9, February 2019;*
- *OMS Manual for the dewatering dikes v8; February 2019.*

Table 7.2 shows all spills that occurred on site, in Baker Lake and along the AWAR in 2018. Most spills were between 10 and 80L and were due to mechanical issues (e.g. broken hydraulic hoses).

As per NIRB Recommendation 14 found in "*NIRB's 2014-2015 Annual Monitoring Report for the Meadowbank Gold Project and Board's Recommendation*": Condition 75 requires that the Proponent provide a complete list of possible accidents and malfunctions for various Project components which includes an assessment of the accident risk and mitigation developed in consultation with Elders and Meadowbank Gold Project – 2014 Annual Report potentially affected communities. Although it is unclear in the submitted management plans whether and how these were developed in consultation with Elders and potentially affected communities. The Board requests that Agnico provide within its 2014 annual reporting, further discussion as to how various management plans relating to accident risk and mitigation have been developed in consultation with Elders and potentially affected communities.

In the 2014 Annual Report, Agnico complied with most of this condition, including the provision of a list of possible accidents and malfunctions as contained in the Spill Contingency and Emergency Response Plans. These Plans were originally reviewed as part of the NIRB and NWB License application process. As such there was extensive public review which included elders' participation at the associated hearings.

Furthermore, Agnico has consulted, yearly, with Elder representation as part of the Baker Lake Liaison Committee. No significant spills occurred in 2018 and therefore possible accidents and malfunctions were not specifically discussed at the committee meetings in 2018. Although there were no concerns raised regarding this issue, Agnico did reassure the committee that the company would respond adequately to any spills occurring on the road. On December 18th, 2018, Agnico held a meeting in the Hamlet of Baker Lake to explain to the community the Policies and Procedures of the All Weather Access Road from Baker Lake to the Meadowbank Mine site. Additionally, at the suggestion of community members in 2017, Agnico held an AWAR safety meeting specifically for youth on May 22nd, 2018. Agnico also conducts quarterly meetings with the Baker Lake Community Liaison Committee and issues related to the use of the AWAR are discussed regularly.

In 2018, as part of the International Cyanide Management Code (ICMC), no specific meeting were held with Baker Lake Community. However, notices have been posted on social media and radio announcements.

To prevent and ensure accidents and malfunctions are dealt appropriately the following activities were held in 2018:

- Crisis management training were held at the Meadowbank site to test Agnico ability to respond to a crisis. Personnel from all departments participated in the crisis scenario. Also, training session regarding the role and responsibility were given to management people in 2018.

- Personnel at the Baker Lake Marshalling facility were given an information/training session on how to react to a major spill at the Baker Lake Bulk Fuel Storage & Marshalling Facility in August 2018. Among these personnel were Marshalling Area Supervisors, Warehouse Technicians, Environmental Technicians, and contractors from Intertek. This training was provided by the Environment Department.

SECTION 8. MONITORING

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 16: ***The results of monitoring under the Aquatic Effects Management Plan (AEMP) including:***

- ***Core Receiving Monitoring Program (CREMP);***
- ***Metal Mining Effluent Regulation (MMER) Monitoring;***
- ***Mine Site Water Quality and Flow Monitoring (and evaluation of NP-2);***
- ***Visual AWAR water quality monitoring;***
- ***Blast Monitoring;***
- ***Groundwater Monitoring.***

And

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 16: ***The results of monitoring related to the Aquatic Effects Monitoring Program (AEMP) including:***

- ***Core Receiving Environment Monitoring Program (CREMP);***
- ***Metal Mining Effluent Regulation (MMER) Monitoring;***
- ***Water Quality and Flow Monitoring;***
- ***Visual Whale Tail Haul Road water quality monitoring;***
- ***Blast Monitoring; and***
- ***Groundwater Monitoring.***

And

As required by NIRB Project Certificate No.008 Item 8: ***All monitoring information collected pursuant to the Project Certificate and various regulatory requirements for the Project shall, if appropriate, given the type of monitoring conducted, contain the following information:***

a) The name of the person(s) who performed the sampling or took the measurements including any relevant accreditations;
b) The date, time and place of sampling or measurement, and weather conditions;
c) The date of analysis;
d) The name of the person(s) who performed the analysis including any relevant accreditations;
e) A description of the analytical methods or techniques used; and
f) A discussion of the results of any analysis.

And

As required by NIRB Project Certificate No 008 Condition 18: ***The Proponent shall, reflecting any direction from the Nunavut Water Board, maintain a Site Water Monitoring and Management Plan designed to:***

- ***Minimize the amount of water that contacts mine ore and wastes;***
- ***Appropriately manage all contact water and discharges to protect local aquatic resources; and***
- ***Implement water conservation and recycling to maximize water reuse and minimize the use of natural waters.***

- ***The Plan should include monitoring that demonstrates contact water (runoff and shallow groundwater) from the ore storage and waste rock storage areas is captured and managed, as per the Waste Rock Facility Management Plan. The plan should be submitted to the NIRB at least 60 days prior to the start of construction, with results submitted annually thereafter.***

Following sections describe the water monitoring as required by the Meadowbank and Whale Tail Water Quality and Flow Monitoring Plan and AEMP. These plans were both approved by the NWB.

Certificates of Analysis are included in Appendix 29 for Meadowbank and Appendix 30 for Whale Tail. The certificates of Analysis detailed:

- name of the person(s) who performed the sampling
- date, time and place of sampling or measurement
- date of analysis
- name of the person(s) who performed the analysis including any relevant accreditations
- description of the analytical methods or techniques used

For all sample collected under the Meadowbank Water Quality and Flow Monitoring Plan, trending was added starting in 2013 up to 2018. The same will be compiled for Whale Tail site in following year.

8.1 CORE RECEIVING ENVIRONMENT MONITORING PROGRAM (CREMP)

8.1.1 Meadowbank Site*

The CREMP 2018 report can be found in Appendix 31. Please take note that the following is just a summary of the CREMP report and Agnico will refer you to the whole report in Appendix 31 for an exhaustive comprehension of the program and results for 2018. Agnico will also refer the reader to Table ES-1 of the CREMP 2018 report for a summary of key finding with temporal and spatial trend assessment and annual CREMP results compared to FEIS prediction.

The CREMP focuses on identifying changes in limnological parameters, water and sediment chemistry, or changes to primary (phytoplankton) and secondary (benthic invertebrate community) aquatic producers that may be associated with mine development activities. This is accomplished through the application of a temporal/spatial trend assessment that includes application of quantitative decision criteria (i.e., early warning “triggers” and action “thresholds”) to facilitate immediate and objective decision-making regarding appropriate management actions. This information is integrated annually into the Aquatic Ecosystem Monitoring Program (AEMP) for holistic environmental management and decision making.

Meadowbank Study Lakes

CREMP monitoring started in 2006 and in-water mine development started in 2008. Key mine development activities that could result in changes to the aquatic receiving environment include: East Dike construction (2008), Bay-Goose Dike construction (2009-10), dewatering of both lakes and impoundments (2009-11, 2013, 2014), effluent discharge (2012 to present), and general site-related

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mining activities that mostly generate dust (e.g., rock crushing, blasting, ore and waste hauling; 2008 to present). Key findings for 2018:

- Water Quality - Similar to previous years, statistically significant mine-related changes continue to be detected relative to baseline/reference conditions at one or more near-field (NF) areas for alkalinity (TPE, SP); conductivity (TPN, TPE, SP, WAL); hardness (TPN, TPE, SP, WAL); major cations (i.e., calcium, potassium, magnesium, and sodium [TPN, TPE, SP, WAL]); and TDS (TPN, TPE, SP, WAL). In the absence of effects based thresholds (e.g., CCME water quality criteria) for these parameters, their triggers were set at the 95th percentile of baseline data. While these results represent mine-related changes, the observed concentrations are still relatively low and there is no evidence to suggest concentrations are increasing year-over-year or that the observed concentrations would result in adverse ecological effects. Consistent with previous reporting cycles, there were no trigger exceedances in 2018 for any water quality parameters with CCME water quality guidelines, including metals. In the context of the FEIS, the magnitude of potential effect on water quality in each of the near-field lakes in 2018 was considered low (i.e., less than 1x the CCME WQGs) and consistent with predictions. Routine water quality monitoring will continued for 2019, consistent with recent CREMP cycles in 2015 to 2018.

- Sediment Chemistry – Quantitative trigger analysis was completed on metals data from the follow-up targeted sediment coring program at TPE and WAL to verify the apparent increases in sediment metals concentrations observed in 2017. Grab samples were also submitted for analysis from the NF and reference areas in 2018 for analysis of habitat variables (particle size and TOC), metals, and organics analysis on the top 3-5 cm of sediment.

  Chromium concentrations at TPE increased steadily between 2009 and 2013. The suspected cause of the increase is ultramafic rock used to construct the Bay-Goose Dike in 2009 and 2010. Chromium exceeded the trigger value in 2018, but the concentrations were less than those reported in 2017. Natural sedimentation rates in these lakes are low, and the lower reported chromium concentrations in 2018 (which were also seen in 2016) suggest chromium concentrations can vary significantly over a small spatial area. There is conclusive evidence that chromium has increased in the sediments at TPE relative to the baseline period; however, high annual variability in chromium concentrations observed between 2017 and 2018 suggests concentrations have stabilized. A repeat of the coring program will be re-conducted in 2019 to provide three-consecutive years of core chemistry data for interpreting the temporal trend in chromium concentrations.

  2017 was the first year of Before After (BA) analysis of sediment core chemistry at WAL. Arsenic, and to a lesser extent chromium and lead exceeded the trigger values specific to WAL in 2017, but there was uncertainty about whether the exceedances were indicative of a “real” temporal trend or an artefact of spatial heterogeneity in metals concentrations. The 2018 core chemistry results were exceeded the trigger value for arsenic. Chromium and lead were less than their respective trigger values in 2018 (i.e., within the range of baseline concentrations). In the case of arsenic, the mean concentration was lower in 2018 (46.6 mg/kg) compared to 2017 (61.8 mg/kg). These results confirm that there is considerable spatial variability with the sediment basin in WAL. No follow-up studies are recommended for WAL, TPN, or SP in 2019 beyond routine sediment grab sampling to support the benthos community assessment.

- Phytoplankton Community – Water samples for phytoplankton taxonomy analyses were carried out synoptic with the water chemistry sampling program in 2018. Phytoplankton biomass was statistically significantly higher at WAL in 2018 relative to reference/baseline conditions. The observed increase in the BACI assessment was not linked back to any observable site-related activities given there was no discharge of water to WAL in 2018. Nutrient concentrations in WAL remain well below levels associated with increased primary productivity. The absolute biomass values at the NF are in line with their historical values. Taking into consideration all the lines of evidence (BACI and absolute values plotted over time), there is no evidence to suggest mining operations are increasing primary productivity in the NF areas. Phytoplankton richness was similar to previous monitoring cycles. The trends in phytoplankton biomass and richness will be reviewed again in 2019.

- Benthic Invertebrate Community – The only statistically significant change to the benthic invertebrate community at Meadowbank identified by the BACI assessment in 2018 was for a reduction in total abundance for the three-year (2016 to 2018 [-48%; p = 0.07]) and four-year (2015 to 2018 [47%; p = 0.04]) time periods at TPE relative to baseline/reference conditions. That result, however, appears to be due mainly to particularly high abundance at INUG in recent years relative to its baseline years rather than on actual reductions at TPE. Absolute total abundance at TPE in 2018 (~2,500 organisms/m2) was stable relative to the range of values dating back to 2012 (2,220 to 3,100 organisms/m^2) and was well within its baseline range. The regional increase in abundance assumed by the BACI model based on the pattern at INUG is not apparent at reference area PDL. Furthermore, there were no statistically significant changes in taxa richness, a key metric for metals-related effects due to the loss of sensitive taxa. Richness at TPE has remained consistent throughout the monitoring period, indicating that mining activities are not adversely affecting the structure of the benthic invertebrate community. Collectively, these results suggest that the apparent reduction in total abundance at TPE is most likely an artefact of the BACI model rather than a real ecological change to the benthic community.

- Sediment Metals Bioavailability – Targeted studies were also completed at TPE in 2018 to further assess mining-related changes to sediment chromium concentrations at TPE. As described above for sediment chemistry, chromium concentrations (grab and core samples) appear to have stabilized since 2013, but the variability observed since then is evidence of small-scale spatial heterogeneity. A bioavailability study (consisting of geochemical sequential extraction analyses and sediment toxicity test) conducted in 2015 showed low metals availability and low toxicity. This study (minus the sequential extraction analyses) was repeated in 2018. Key finds from the 2018 study are:

    - Sediment toxicity testing results from the 2018 amphipod test suggest metals might be increasing in their bioavailability compared to 2015. The amphipod test showed substantial effects to survival that were not correlated to sediment chromium concentrations. The cause of impaired survival in TPE sediments is unclear, but the results suggest other exposure pathways (e.g., porewater) or stressors (e.g., physical or chemical) may be responsible for the toxicity seen in 2018. Confounding the assessment is the fact that three of the five replicates in the amphipod test had complete mortality, while one had 100% survival.

    - The chironomid test did not show any effects to survival at TPE in 2018, but did have reduced growth (-21%) relative to the field controls (INUG/PDL). Given their dominance in the benthic invertebrate communities of the Meadowbank study lakes, the chironomid toxicity test results are considered more ecologically relevant for this site.

A weight-of-evidence approach was used to integrate the results of the routine and targeted studies at TPE in 2018. While there was some toxicity to chironomids (reduced growth), the highest weight was applied to the field survey data for the benthic community at TPE, which showed stable or improving results for total abundance and taxa richness over the last six years that were consistent with the baseline range. That said, there are uncertainties regarding the exact cause of the observed effects to H. azteca (benthic) survival in 2018 that warrant follow-up in 2019 to provide added assurance that bioavailability is not changing at TPE. Amphipods are not reflected in the natural benthos community present in the study areas; however, as an "indicator" taxon, the results from 2015 and 2018 provide important information about how exposure conditions have changed over time. H. azteca is more sensitive to the effects of pollution than C. dilutes (benthic), and from a site management perspective, the H. azteca test results serve as the equivalent of an "early warning trigger" for detecting changes in sediment chemistry before more ecologically significant effects to C. dilutus are detected. Two recommendations for 2019 to help better understand risks to the benthic invertebrate community at TPE: (1) continue scrutiny of trends in benthic invertebrate abundance and richness at TPE, and (2) repeat the sediment toxicity testing (chironomid and amphipod tests) at TPE in 2019 with the addition of porewater sampling to try to determine the cause of the reduced chironomid growth and amphipod survival in TPE sediments.

Baker Lake

CREMP monitoring at Baker Lake started in 2008. Key mine-related activities include barge/shipping traffic and general land-based activities associated with the tank farm area. Approximately double the number of barge shipments arrived at BPJ in 2018 to support construction activities for the Whale Tail Project. No spills of fuel, hydrocarbons or any other materials were reported in the vicinity of the barge dock or jetty in 2018.

- Chemistry – Sampling was conducted at two near-field (BBD, BPJ) and one (BAP; water) or two (BAP, BES; sediment) areas situated along the north shore of Baker Lake in July, August, and September. There were no cases where water quality parameters exceeded the triggers in 2018, consistent with recent monitoring cycles. Metals concentrations in sediment grab samples collected to support the benthos assessment were well within previously-reported concentrations at the four locations. There was no evidence of any barge-related impacts to water quality or sediment chemistry at impact areas in Baker Lake. The trends in water and sediment chemistry (grab) will be monitored in 2019.

- Biological Communities – The phytoplankton and benthos communities in Baker Lake have not exhibited any changes that are attributable to Agnico Eagle's activities in Baker Lake. No follow-up management actions are required for 2019 beyond routine monitoring.

8.1.2 Whale Tail Site*

As required by NIRB Project Certificate No.008, Condition 19***: The Proponent shall, reflecting any direction from responsible authorities such as the Nunavut Water Board, Fisheries and Oceans Canada and Environment***

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and Climate Change Canada, maintain a Core Receiving Environment Monitoring Program (CREMP) designed to:

- ***Determine the short and long-term effects in the aquatic environment resulting from the Project;***
- ***Evaluate the accuracy of Project effect predictions;***
- ***Assess the effectiveness of mitigation and management measures on Project effects;***
- ***Identify additional mitigation measures to avert or reduce environmental effects due to Project activities;***
- ***Comply with Metal Mining Effluent Regulations requirements, should an Environmental Effects***
- ***Monitoring program be triggered;***
- ***Reflect site-specific water quality conditions;***
- ***Include details comparing the watershed features in the Whale Tail watershed to those watersheds used as reference lakes; and***
- ***Evaluate the mixing and non-mixing portion of the pit.***

The CREMP should include sufficient sampling and monitoring programs to appropriately characterize the receiving environment to ensure that adequate data is available to assess impact predictions made within the Environmental Impact Statement for the Whale Tail Pit Project. The updated plan should be submitted to the NIRB at least 60 days prior to the start of construction, with results submitted annually thereafter.

And

As required by NIRB Project Certificate No.008 Condition 17: ***The plan should be submitted to the NIRB at least 30 days prior to the start of construction, with results submitted annually thereafter. The Proponent shall:***

a) Monitor the effects of project activities and infrastructure on surface water quality conditions;
b) Ensure the monitoring data is sufficient to compare the impact predictions in the Environmental Impact Statement (EIS) for the Project with actual monitoring results;
c) Ensure that the sampling locations and frequency of monitoring is consistent with and reflects the requirements of the Water Quality and Flow Plan and the Core Receiving Environmental Monitoring Program; and
d) On an annual basis, the Proponent will compare monitoring results with the impact assessment predictions in the EIS and will identify any significant discrepancies between impact predictions and monitoring results.

And

As required by NWB Water License 2AM-WTP1826 Part I, Item 3: ***The Licensee shall submit for Board approval, at least ninety (90) days prior to Operations an updated CREMP. The Program shall include all comments provided during the technical review of Application and shall include a comparison of monitoring results for receiving waters to model predictions (including base case predictions) and to thresholds identified for management actions, should trends indicate water quality objectives may be exceeded.***

The CREMP 2015 Plan update – Whale Tail Addendum (May 2018) can be found in Appendix 51.

The CREMP 2018 report can be found in Appendix 31. Please take note that the following is just a summary of the CREMP report and Agnico will refer you to the whole report in Appendix 31 for an exhaustive comprehension of the program and results for 2017. Agnico will also refer the reader to Table ES-2 of the CREMP 2018 report for a summary of key finding with temporal and spatial trend assessment and annual CREMP results compared to FEIS prediction.

The Whale Tail Project was merged with the Meadowbank and Baker Lake CREMP reporting framework in 2018. Baseline data collection continued for most of the study area lakes in 2018. With the onset of in-water construction activities in Whale Tail Lake, Whale Tail Lake -South Basin (WTS) and Mammoth Lake (MAM) transitioned from control to impact designations in late July and November, respectively. While no major in-water construction activities occurred in Mammoth Lake in 2018, road construction and quarry development adjacent to the lake in the fall had the potential to affect downstream water quality in this lake; subtle changes in water quality were observed in the November sampling event. The focus on the 2018 reporting of the Whale Tail study area lakes was on describing current conditions in the context of baseline data collected for the Project using plots of the various endpoints over time. A statistical approach to comparing potential changes at WTS was considered unnecessary for assessing changes in 2018 and supporting management decisions in 2019. Given the limited amount of data in the “after” period and the absence of site-specific triggers and thresholds, this year’s assessment of spatial and temporal trends focused on visual identification of construction-related changes (i.e., emphasis on WTS and MAM relative to the rest of the areas). Future assessments will follow the same process used for Meadowbank (i.e., use of triggers/thresholds and formal statistical testing of trends).

- Water Quality – Water quality reported from the first half of 2018 was broadly representative of baseline conditions observed between 2014 and 2017 at the six Whale Tail study areas.

  Construction activities started in late July and resulted in some predictable changes in water quality at WTS during the open water construction season. TSS concentrations measured at 2 mg/L in the August sampling event were below the Meadowbank specific trigger value of 3 mg/L. By September, TSS was trending lower and was <1 mg/L (MDL) in the samples collected in November. Concurrent with the modest increase in TSS in August was an increase in the number of parameters that were > MDL and an increase in the absolute concentration of some parameters. Increased total metals such as aluminum, chromium and iron were correlated with increased TSS in August, but the observed increase was short-lived; by November, the concentrations were back to the range reported during the baseline period. More importantly, there were no measured exceedances of the CCME water quality guidelines for parameters with effects-based thresholds at WTS in 2018, indicating the transient spike in some metals were unlikely to adversely affect aquatic life.

  Mammoth Lake (MAM) water quality showed similar seasonal trends in 2018 compared to the baseline period, but in November there was evidence to suggest construction or other site-related activities were resulting in changes in some water quality parameters. The apparent changes were first noticed in the specific conductivity profile from the northeast corner of MAM in November. The upper limit for conductivity at MAM is approximately 75 µS/cm; in November the readings taken at 1 m intervals measured 100 µS/cm near the surface and increase to 150 µS/cm near the bottom. A similar pattern was observed in the December profile taken at the same location in the northeast corner of the lake. The spatial extent of changes in MAM water quality did not extend throughout the lake based on the specific conductivity results from the second profile collected in November at the other basin in MAM.

  Among the parameters measured in the November water samples, hardness, TDS, nutrients (e.g., nitrate and phosphorus), metals (e.g., total and dissolved aluminum, total chromium, and total iron) were measured at higher concentrations compared to earlier in the year and compared to baseline November events in 2016 and 2017. Similar to WTS, there were no measured exceedances of the CCME water quality guidelines for parameters with effects-based thresholds.

The available data from 2018 show the spatial extent of the construction related changes in water quality did not extend downstream from MAM to Lake A76. NEM, A20 and Lake DS1 were similarly kept in the “control” phase for the duration of 2018. Routine water quality monitoring is recommended for 2019 with analysis of the data using the same BACI statistical assessment used for Meadowbank.

- Phytoplankton Community – Phytoplankton taxonomy analyses were carried out synoptic with the water chemistry sampling program in 2018. Phytoplankton communities vary naturally throughout the year in total biomass (and density) and community composition (taxa richness). The primary site-related stressors that have the potential to affect the phytoplankton community included nutrient loading and increased concentrations of metals. Nutrient loading can manifest as an increase in total biomass or a change in community structure, while effects to increasing metals would be expected to result in lower biomass and taxa diversity. Overall there was no evidence to suggest site-related activities caused changes in primary productivity in the near-field areas (MAM and WTS) due to construction activities in 2018. The trends in phytoplankton biomass and richness will be assessed using the BACI framework as the project continues on into the construction phase in 2019.

- Sediment Chemistry – Lakes in the Whale Tail study area have naturally-high concentrations of some metals. Arsenic, cadmium, chromium, copper, and zinc exceeded the CCME interim sediment quality guideline in at least one sample collected in 2018. Of these five metals, arsenic is particularly enriched in sediments throughout the study area lakes, with most samples exceeding the CCME probable effect level sediment quality guideline. There was no indication of a temporal increase in sediment metals concentrations at WTS (or any other area) in 2018 relative to the baseline period. Sediment core samples, which target the top 1.5 cm of sediment as opposed to the 3 to 5 cm targeted in grab samples, are preferentially used in the statistical testing of temporal trends in sediment chemistry. The next coring study is scheduled for 2020, coinciding with the normal 3-year sediment coring cycle for the CREMP. Routine sediment grab chemistry sampling is recommended in 2019 to support the benthos community assessment and broadly assess changes in sediment chemistry over time at each area.

- Benthos Community – Benthic invertebrate (benthos) community structure (taxa richness) and function (abundance) is typical of northern headwaters lakes in the region (i.e., low abundance and few taxa). Benthos communities in these lakes have, by virtue of their presence, adapted to the naturally-elevated concentrations of metals in sediment. Although total abundance tends to be low, within-area variability can be substantial. Taxa richness, unlike abundance, is more consistent with interannual variability which is quite low for the various areas. The normal range of species identified among the various study areas is 10 to 15; in 2018 there were between 13 and 20 taxa identified at WTS. The comparatively high taxa richness, combined with no apparent change in abundance, demonstrates that dike construction did not alter the structure or function of the benthos community in 2018. Routine monitoring of the benthos community is recommended in 2019, consistent with study design outlined in the Addendum to the CREMP: 2015 Design Document.

8.2 METHYLMERCURY STUDIES WHALE TAIL SITE*

As required by NWB Water License 2AM-WTP1826 Part I, Item 5: ***The Licensee shall submit to the Board for approval and implementation, within sixty (60) days of the approval of the Licence by the Minister, a Mercury Monitoring Studies Program. The Program shall include all comments and recommendations provided during the technical review of Application.***

And

As required by NIRB Project Certificate No.008, Condition 63***: The Proponent shall conduct additional studies as part of its freshwater aquatic effects analyses to ensure that methylmercury concentrations anticipated to increase during operations in the aquatic environment (including in fish tissue) do not exceed regulatory requirements. In addition, the Proponent shall consider assessing potential risks from consumption of fish containing methylmercury by using Health Canada's hazard quotients as a descriptive tool. A summary of the results of these additional studies, including the assessment of the potential risk to people from consumption of fish, shall be included in the Proponent's annual report to the Nunavut Impact Review Board.***

The CREMP Addendum - Appendix A: Mercury Monitoring Plan for Whale Tail South Area (Version 1) was initially submitted for NWB approval on July 2018. In November 2018, NWB approved the monitoring plan and requested an updated version as part of the 2018 Annual Report to address ECCC concerns. The CREMP Addendum - Appendix A: Mercury Monitoring Plan for Whale Tail South Area (Version 2, March 2019) can be found in Appendix 51 and intents to address all ECCC concerns included in the letter '*2AM-WTP1826 – Agnico Eagle Mines Ltd. – Whale Tail Project – AEM Response to ECCC comments on the Mercury Monitoring Plan*' dated October 24th, 2018.

During construction and operation of Whale Tail Pit, the diversion of Whale Tail Lake will cause flooding in the Whale Tail Lake sub-watershed, potentially resulting in increased concentrations of mercury in water and biota.

The Mercury Monitoring Plan (MMP) was developed to define the sampling methods and data evaluation that will are used to assess impacts of the Project on concentrations of mercury in the Whale Tail South flooded area.

The MMP includes analysis of mercury and methylmercury concentrations in surface water, sediment, and fish tissue for locations impacted by flooding, as well as reference locations. Measured concentrations of mercury are compared to FEIS predictions to understand whether impacts of the project were accurately identified.

The 2018 Whale Tail Mercury Monitoring Report can be found in Appendix 32. Below is a summary of the major finding.

Baseline monitoring for mercury was conducted in 2016-2017 and are presented in Appendix A of the 2018 Mercury Monitoring Report (Appendix 32). In 2018, construction of the Whale Tail Dike began in July, but no flooding occurred prior to mercury monitoring in August. Therefore based on the objectives of the Mercury Monitoring Plan, 2018 was considered a baseline year for all sampling locations.

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In 2018, supplemental baseline samples of surface water, sediment, and fish tissue were collected. Surface water samples were collected for all sampling locations in August (Whale Tail Lake South, Lake A20, Lake A63, Lake A65, Lake A76, Mammoth Lake, Nemo Lake, Lake 8).

Sediment chemistry was assessed for one location (3 replicates) in Whale Tail Lake (South Basin). Results were similar to baseline samples collected in 2016-2017 presented in Appendix A of the 2018 Mercury Monitoring Report (Appendix 32), and indicate that total mercury in sediment in Whale Tail Lake (South Basin) is below the Canadian Sediment Quality Guideline for the Protection of Aquatic Life.

Supplemental baseline analysis of mercury in fish tissue was also conducted on tissue samples collected during the fishout of Whale Tail Lake (North Basin) and for small bodied fish in conjunction with productivity research studies. Results of this analysis are not yet available and will be reported in the 2019 Annual Report.

This information will provide a foundation for the evaluation of mercury monitoring data to be collected from flooded areas, beginning in 2019.

8.3 MDMER AND EEM SAMPLING

8.3.1 Meadowbank Site

This section includes the results of the monitoring programs conducted under the Metal and Diamond Mining Effluent Regulations (MDMER) and its Schedule 5 Environmental Effects Monitoring (EEM) Studies. A list of the sampling location GPS coordinates is provided in Table 8.1 (Appendix 1). Figures 1, 2, 3 and 4 illustrate the location of sampling stations at the Meadowbank mine site, EEM receiving environment monitoring program, the Vault Site, and Baker Lake marshalling facilities, respectively. Certificates of Analysis are included in Appendix 29.

8.3.1.1 Portage Attenuation Pond Discharge

On November 19, 2014 tailings deposition commenced in the South Cell (Portage Attenuation Pond) and this represented the end of use of the Portage Attenuation Pond. There has been no further effluent discharge to Third Portage Lake since November, 2014. Therefore sample locations ST-9 (Portage Attenuation Pond effluent discharge point) or ST-MMER-1 are no longer active.

8.3.1.2 Vault Attenuation Pond Discharge

The Vault Discharge became subject to the MDMER on June 27, 2013 during the dewatering of Vault Lake. There was no discharge (sampling station ST-10, also named ST-MMER-2) from the Vault Attenuation Pond to Wally Lake in 2018. There is currently no plans to have a discharge in 2019.

8.3.1.3 East Dike Discharge

The East Dike Seepage Discharge became subject to the MDMER on January 6, 2014. In 2018, Agnico continued to pump water from the two collection points, South and North seepage and discharged through a common header through a diffuser into Second Portage Lake. The seepage water was released into the environment, prior to contact with mining activity, without treatment as it is compliant with section 4 (1) of the regulation. Discharge monitoring samples were collected weekly and acute toxicity was sampled quarterly. Agnico Eagle sent a request to ECCC in February 2016 to reduce the testing frequency of the Ra226 to once per quarter. On March 15, 2016, the request was approved by

ECCC. Agnico sent a second request in August 2016 to ECCC to reduce the sampling frequency of Item 1 to 6 in column 1 of the Schedule 4, reduce acute lethality and Daphnia magna testing to not less than once per quarter. On September 15, 2016, ECCC approved the Agnico Eagle's request. The reduced frequency has started on October 1, 2016. Results are provided in Table 8.2 (Appendix 1).

East Dike Seepage (sampling station ST-8, also named ST-MMER-3) was discharged into the receiving environment, Second Portage Lake (SPL), from January 1st to June 3rd and from August 21st to December 31st, 2018. The total volume discharged in 2018 was 140,690 m^3. There was no exceedance of the TSS MDMER/Water License limit in 2018. However, discharge was stopped on June 3rd, following a TSS trending up. Water was directed to the Portage Pit sumps and discharge to SPL was restarted once the results showed compliance with regulatory limits. Notification to CIRNAC and ECCC's Inspector provided on June 4th, 2018.

Three non-compliance with the MDMER regulation were observed in 2018:

- No pH measurement on May 14, 2018 following field technician omission

- No sample was collected at East Dike Discharge Effluent (ST-MDMER-3) for the week of December 2nd to December 8th, 2018 as required by MDMER Division 2 Section 12(1). The sample was supposed to be taken on December 3rd, 2018 but because of plane delays the sample had to be cancelled. Agnico had planned to resample the following day, on December 4th, 2018, but field execution prevented the sample from being retaken and thus no samples were taken during the aforementioned week. Notice sent to ECCC Inspector on January 23, 2019.

- No acute lethality testing for trout and daphnia was conducted in the fourth quarter of 2018 as per the MDMER Section 16(1). The quarterly sample was taken on November 19th, as planned, and was sent by our charter plane the same day. On November 22nd, 2018, the accredited laboratory sent a notice to only one technician of the Environmental Department staff to let them know that the sample had arrived frozen and that the analysis could not be performed. When this notification was sent, the environmental technician was not on site anymore, as his rotation was complete. The technician had left site on the 21st November. Since nobody else within the Agnico team had received the notification, it was therefore impossible for Agnico to be aware of the sample being rejected and thus, no other sample was collected. Upon review of 4th quarter, as per MDMER 21(1) and expecting results, the compliance technician requested update from the Laboratory and this is when the environmental team was made aware of the situation. Upon further investigation, it appears that the sample was received in good condition from the charter delivery to H2Lab based in Val-d'Or. H2Lab then subcontracts a third-party laboratory to perform the lethality testing (Eurofin). It is that shipment, completed and organized by H2Lab that arrived frozen at Eurofin based in Quebec City. The site environmental department had no reasonable doubt to think the sample was rejected since a sublethal testing (required by MDMER Schedule 5 Section 5(1)) was also performed and shipped on the same day, but shipped directly to a different lab (Aquatox, based in Guelph, Ontario). This sample arrived at the laboratory in a proper state. Notice sent to ECCC Inspector on February 8, 2019.

The volume of water discharged to the environment was reported on a weekly basis pursuant to the MDMER monitoring program requirements. Table 8.3 (Appendix 1) provides a daily breakdown of volumes of water pumped.

Under the Environmental Effects Monitoring (EEM) program, Agnico was required in 2018 to collect sub-lethal toxicity samples at this discharge point. As per subsection 6(1) *"[…] sub-lethal toxicity test under Section 5 shall be conducted two times each calendar year for three years and once each year after the third year […]*" because East Dike Discharge was the only effluent in 2018 it became the mine's final discharge point that has potentially the most adverse environmental impact on the environment. The sub-lethal toxicity samples were collected, for the first year, on September 10th and November 19th, 2018. The water quality samples were taken from the discharge location (ST-MMER-3), the receiving environment exposure area (SPLE or ST-MMER-3-EEM-SPLE) and reference area (TPS or ST-MMER-1-EEM-TPS). These sampling locations are highlighted on Figures 1 and 2. Results of the EEM water quality monitoring program are presented in Tables 8.4 (Appendix 1). The EEM effluent characterization monitoring samples were collected in February, September, October and November. Samples were also collected from the exposure (SPLE) and reference (TPS) areas in February, May, October and November. This data was previously reported to Environment Canada via the RISS electronic database reporting system.

8.3.2 Whale Tail Site

8.3.2.1 Whale Tail North Construction

During the in-water portion of the Whale Tail Dike Construction, Agnico had discharge an effluent from the construction dewatering activities. The Whale Tail Site became subject to the MDMER on July 27th, 2018. The final discharge point Whale Tail North Basin (ST-MDMER-4) was in operation between July 27th to August 10th and between August 14th to August 27th. The sample was taken from the Water Treatment Plan prior to the release on the tundra, which flows onto a natural boulder field at the edge of the Whale Tail Lake North Basin (receiving environment). Results are provided in Table 8.5 (Appendix 1).

The volume of water discharged to the environment was reported on a weekly basis pursuant to the MDMER monitoring program requirements. The total volume discharged in 2018 was 321,537 m^3. Table 8.6 (Appendix 1) provides a daily breakdown of volumes of water pumped.

Under the Environmental Effects Monitoring (EEM) program, Agnico was required in 2018 to collect sub-lethal toxicity samples at this discharge point. As per subsection 6(1) *"[…] sub-lethal toxicity test under Section 5 shall be conducted two times each calendar year for three years and once each year after the third year […]*". No sublethal toxicity has been taken in compliance with Schedule 5 Section 6(1). Agnico had planned to take this sublethal toxicity sample on September 3rd but the discharge stopped on August 27th. It was not possible to conduct the sublethal testing before this date since all of the accredited laboratories able to conduct the analysis were overbooked. Agnico sent a notification to ECCC Inspector on September 6, 2018

The water quality samples were taken from the discharge location (ST-MMER-3), the receiving environment exposure area (WTN or ST-MDMER-4-EEM-WTN) and reference area (TPS or ST-MMER-1-EEM-TPS). These sampling locations are highlighted on Figures 1 and 2. Results of the EEM water quality monitoring program are presented in Tables 8.7 (Appendix 1). This data was previously reported to Environment and Climate Change Canada via the RISS electronic database reporting system. In 2018, there was only 29 days of discharge. Thus, only one (1) water quality samples was collected at the Whale Tail North Basin exposure and reference areas. On August 6th, Agnico conducted the Water quality monitoring as required by Schedule 5 Section 7(1). Radium 226 was not analysed for the exposed area as the bottle was not provided to the accredited laboratory. When Agnico notice the missing parameters, the discharge was already stopped and it was impossible to take a second sample. Agnico sent a notification to ECCC Inspector on September 6, 2018.

Five non-compliance with the MDMER regulation were observed in 2018:

- As required by MDMER Division 2 Section 12(1), Agnico did not collected on July 27th or 28th, 2018 a sample of effluent from the final discharge point.
- As required by MDMER Division 2 Section 12(1), Agnico did not collected for the week of July 29th to August 4th, 2018 a sample of effluent from the final discharge point. Agnico didn't record the pH and the concentrations of the deleterious substances prescribed in Section 3 for this week. As the discharge started on July 27th there is no sample taken before this week. Analyses of the MDMER data for the following week were all below the authorized limits of deleterious substances. Notification sent to ECCC Inspector on September 06, 2018.
- As required by MDMER Division 2 Section 14(1), Agnico did not collected for the month of July a toxicity sample.
- No sublethal toxicity has been taken in compliance with Schedule 5 Section 6(1). Agnico had planned to take this sublethal toxicity sample on September 3rd but the discharge stopped on August 27th. It was not possible to conduct the sublethal testing before this date since all of the accredited laboratories able to conduct the analysis were overbooked. Agnico sent a notification to ECCC Inspector on September 6, 2018.
- On August 6th, Agnico conducted the Water quality monitoring as required by Schedule 5 Section 7(1). Radium 226 was not analysed for the exposed area as the bottle was not provided to the accredited laboratory. When Agnico notice the missing parameters, the discharge was already stopped and it was impossible to take a second sample. Agnico sent a notification to ECCC Inspector on September 6, 2018.

8.4 ENVIRONMENTAL BIOLOGICAL STUDY

8.4.1 Meadowbank Site - EEM Study Design Cycle 3

The Meadowbank Mine began discharging treated effluent (TSS removal during dewatering activity) during 2009, and was subsequently required under the Metal and Diamond Mining Effluent Regulations (MDMER) to monitor effects of that effluent on fish and fish habitat. The second EEM Interpretive Report was submitted to Environment and Climate Changes Canada on June 26, 2015 (Appendix G3 of the 2015 Annual Report). This report documents the results of the adult fish population survey and the benthic invertebrate community survey completed for the mine`s Cycle 2 EEM biological monitoring studies, as well as the sub-lethal toxicity testing carried out on the Meadowbank Division effluent since the drafting of the Cycle 2 Study Design. Agnico received from the EEM Cycle 2 Interpretative report's comments from ECCC on January 20, 2017. On February 21, 2017 Agnico sent the response to ECCC's comments (Appendix G3 of the 2016 Annual report for ECCC comments and Agnico' s response)

As required by ECCC, a Biological Monitoring Study (EEM Cycle 3 study) was conducted in 2017 to assess the Wally Lake (Vault Discharge). The Vault discharge was at this time the effluent which has been determined the greatest potential to have an adverse effect on the receiving environment. While discharge is occurring, plume/effluent mixing in the exposure area has been assessed during the summer of 2017 in support of the Cycle 3 study design. The study design was submitted to ECCC on February

17, 2017 (Appendix G3 of the 2017 Annual Report). On April 10, 2017 Agnico received comments from the TAP regarding our Cycle 3 Study Design. On April 26, 2017 Agnico responded to these comments (Appendix G4 of the 2017 Annual Report). The study design was subsequently approved. In June 2018, the Environmental Effect Monitoring Study 3 Interpretative Report was submitted to ECCC. The full data of the study has been processed and results are presented in Appendix 33. Agnico Eagle will continue to provide KIA and other regulators copies of reports and data submitted to ECCC via the Annual report.

8.5 MINE SITE WATER QUALITY AND FLOW MONITORING

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 15: *The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I.*

And

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 15: *The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I.*

And

As required by DFO Authorizations NU-03-0191.3 Condition 3.1 (Second and Third Portage Lakes), NU-03-0191.4 (Vault Lake) Condition 3.1; NU-03-0190 Condition 5 (AWPAR), NU-14-1046 (Phaser Lake) Condition 3; *Submit written report summarizing monitoring results and photographic record of works and undertakings.*

This section includes the aquatic monitoring requirements as detailed under the Meadowbank Water Quality and Flow Monitoring Plan (Version 5, 2016) and the Whale Tail Water Quality and Flow Monitoring Plan (Version 6, 2019). A list of the sampling location GPS coordinates for aquatic monitoring programs conducted by Agnico is provided in Table 8.1 (Appendix 1). Summaries of associated aquatic monitoring reports are presented in the following section of this report and supporting documents are located in the listed appendices. Figures 1, 2, 3, 4 and 6 illustrate the location of sampling stations at the Meadowbank and Whale Tail mine site, EEM receiving environment monitoring program, Vault Site, and Baker Lake marshalling facilities respectively. Certificates of Analysis are included in Appendix 29 for Meadowbank and Appendix 30 for Whale Tail. All tables from this section included historical data since 2013, if available.

8.5.1 Construction Activities

8.5.1.1 Meadowbank Site

As required by DFO Authorization NU-03-0191.3 Condition 3.1: *The Proponent shall undertake monitoring and report to DFO annually, by March 31st, whether works, undertakings, activities or operations for the mitigation of potential impacts to fish and fish habitat were conducted according to the conditions of this Authorization.*

And

As required by DFO Authorization NU-03-0191.4 Condition 3.1: *The Proponent shall undertake monitoring and report to DFO annually, by December 31st, whether works, undertakings, activities or operations for the mitigation of potential impacts to fish and fish habitat were conducted according to the conditions of this Authorization.*

In 2018, there were no occurrences where runoff water from any work, undertaking, activity or operation would flow directly or indirectly into a water body. No mitigation action was necessary.

8.5.1.2 Whale Tail Site

As required by DFO Authorization 16HCAA-00370 Condition 3.1: ***The Proponent shall monitor the implementation of avoidance and mitigation measures referred to in section 2 of this authorization, and provide a stand-alone report to DFO, by March 31, annually and indicate whether the measures and standards to avoid and mitigate serious harm to fish were conducted according to the conditions of this authorization.***

And

As required by DFO Authorization 16HCAA-00370 Condition 3.1.1: ***The report in addition to the above shall summarizes the monitoring results related to fish and fish habitat contained in the documents listed in section 2.3. The report shall include a description of the implementation as well as an evaluation of the effectiveness of those monitoring programs in validating the changes to fish and fish habitat predicted in the Proponent's Environmental Impact Statement.***

And

As required by DFO Authorization 16HCAA-00370 Condition 3.1.2: ***Each year, following the submission of the annual monitoring report to DFO, the Proponent shall arrange to meet with DFO and interested parties (e.g. Kivalliq Inuit Association) to review the results of the previous year's monitoring programs. The results of the meetings and any mutually agreed upon modifications aimed at improving the effectiveness of the monitoring programs shall be incorporated into the upcoming year of the monitoring programs. The Proponent shall update the monitoring programs/plans to reflect the changes, and the programs/plans shall be approved in writing by DFO prior to implementation.***

And

As required by DFO Authorization 16HCAA-00370 Condition 3.1.3: ***The annual monitoring report shall provide dated photographs with GPS coordinates and description of locations and inspection reports to demonstrate effective implementation and functioning of mitigation measures and standards described above to limit the serious harm to fish to what is covered by this authorization.***

And

As required by DFO Authorization 16HCAA-00370 Condition 3.1.4: ***The annual monitoring report shall also provided details of any contingency measures that were followed to prevent impacts greater than those covered by this authorization in the event that mitigation measures did not function as described.***

Agnico has provided to DFO on April 2nd,2019, the 2018 Technical Memorandum on Avoidance of Serious Harm to Fish and Fish Habitat – Whale Tail Project (Appendix 34) to addresses Conditions 3.1, 3.1.1, 3.1.3 and 3.1.4 of the Whale Tail Fisheries Act Authorization 16-HCAA-00370.

Agnico will refer to the Appendix 34 for a complete review of the assessment. The Technical Memorandum discusses:

- avoidance and mitigation measures included in Authorization Condition 2.3 as listed below:

1. Adherence to the General Fish-out Protocol for Lakes and Impoundments in the Northwest Territories and Nunavut;

2. Adherence to the Freshwater Intake End-of-Pipe Fish Screen Guideline for any and all intake in waterbodies that support fish;

3. Development of a Blasting Mitigation Plan, which shall adhere to the guidance in Monitoring Explosive-Based Winter Seismic Exploration in Waterbodies;

4. Adherence to the Protocol for Winter Water Withdrawal from Ice-Covered Waterbodies in the Northwest Territories and Nunavut; and

5. Ensure that all project infrastructure in watercourses is designed and constructed in such a manner that it does not unduly prevent or limit the movement of water or fish species in fish bearing streams and rivers, unless otherwise authorized by DFO.

- as described in Condition 3.1.1, this report also summarizes the monitoring results related to fish and fish habitat contained in the documents listed in Authorization Section 2.4. The referenced documents are:

  1. Core Receiving Environment Monitoring Program (CREMP): 2015 Plan Update Whale Tail Pit Addendum (May 2018)

  2. Water Quality and Flow Monitoring Plan (Version 3, May 2018)

  3. Water Quality Monitoring and Management Plan for Dike Construction and Dewatering (Version 1, January 2017)

  4. Conceptual Whale Tail Lake (North Basin) Fish-out Work Plan

- Where appropriate, dated photographs with GPS coordinates and inspection reports are provided to demonstrate effective implementation of these mitigation measures and standards, as described in Authorization Condition 3.1.3

- Details of any contingency measures that were required to be followed to prevent further impacts in the event that mitigation did not function properly are provided, according to Authorization Condition 3.1.4.

No meeting with DFO was organised to discuss the previous report as 2018 was the first year of reporting.

On July 27 2018, construction of the Whale Tail Dike began. The objective of the report 2018 Water quality for dike construction and dewatering report (Appendix 63) describe results of water quality monitoring that was conducted, and the implementation of any mitigation measures that were required to control the release of total suspended solids (TSS) in the environment. Results are compared to NWB Water License criteria as presented in the report in Appendix. No elevated TSS were observed in Whale Tail South during the dike construction.

8.5.2 Dewatering Activities

8.5.2.1 Meadowbank Site

No dewatering activities occurred in 2018.

8.5.2.2 Whale Tail Site

No dewatering activities occurred in 2018.

8.5.3 Mine Site Water Collection System

8.5.3.1 Meadowbank Site

A water collection system comprised of the Stormwater Management Pond, attenuation ponds, tailings storage facilities, diversion ditches and sumps has been developed to control surface and groundwater at the Meadowbank project. The following section reviews the water quality monitoring conducted around the mine site. Specific details regarding water transfers can be found in the 2018 Water Management Plan and Report (Appendix 8).

8.5.3.1.1 Stormwater Management Pond

The Stormwater Management Pond collects runoff water as well as the STP treated effluent. A total of 55,416 m^3 of water was transferred from the Stormwater Management Pond to the TSF South Cell in June, July and September. No water was released into the environment.

8.5.3.1.2 East and West Diversion Ditches (ST-5 / ST-6)

The East and West Diversion ditches were constructed in 2012 around the North Cell TSF and the Portage RSF. The diversion ditches are designed to redirect the fresh water from the northern area watershed away from the tailings pond and RSF and direct it to Second (via NP2) and Third Portage Lakes. Water from the East diversion ditch (sampling station ST-5) and the West diversion ditch (sampling station ST-6) were sampled monthly during open water as per the requirements in the NWB Water License. Results are presented in Table 8.8 and Table 8.9 (Appendix 1) respectively; the sampling location is illustrated on Figure 1. Results complied with the Water License criteria - stated in Part E Item 6.

8.5.3.1.3 East Dike Discharge (ST-8, ST-MMER-3)

Seepage rates and volumes through the East dike have been stable for the past seven years. In 2018, 140,690 m^3 of water collected from the seepage at the East dike was pumped to Second Portage Lake through the diffuser).

Results from samples collected in 2018 at the final discharge point (ST-8) can be found in Table 8.10 (Appendix 1). Effluent water is analyzed as per NWB Water License Schedule I. The sampling location is illustrated on Figure 1. In 2018, there was no non-compliance observed with the Water License Part E item 6. Three (3) non-compliance with the MDMER regulation were observed. Refer to previous Section 8.3.1.3 East Dike Discharge for the complete information.

8.5.3.1.4 East Dike Seepage (ST-S-1)

As mentioned in Section 8.3.1.3, East Dike Seepage was discharged into the receiving environment, Second Portage Lake (SPL), from January 1st to June 3rd and from August 21st to December 31st, 2018. Discharge was stopped on June 3rd as the TSS results were trending up. As done in the past, water was then directed to the Portage Pit sumps. A total of 55,056 m^3 were transferred to the Portage Pit from June 3rd to August 21st. During that period of time, samples were taking on a monthly basis as per the requirements of the NWB Water License. The ST-S-1 location is the same sampling location as ST-8 and ST-MMER-3 (Figure 1). Results are presented in Table 8.11 (Appendix 1). There are no applicable license limits.

8.5.3.1.5 Portage Attenuation Pond (ST-9, ST-MMER-1)

As of November 19, 2014 when tailings deposition began in the South Cell TSF, the Portage Attenuation Pond ceased operation as an effluent discharge pond. Water in the South Cell TSF is currently used as reclaim water for the mill. There was no discharge from ST-9 into Third Portage Lake in 2018. The location of sampling station ST-9 is illustrated on Figure 1.

Channel crossing inspections were not undertaken in 2018 as no further discharge occurred from the Portage Attenuation Pond into Third Portage Lake.

8.5.3.1.6 Vault Discharge (ST-10, ST-MMER-2)

There was no discharge (sampling station ST-10, also named ST-MMER-2) from the Vault Attenuation Pond to Wally Lake in 2018. There is currently no plans to have a discharge in 2019. The location of sampling station is illustrated on Figure 3.

8.5.3.1.7 Portage Rock Storage Facility (ST-16)

The Portage Waste Rock Storage Facility (PRSF) has been in operation since 2009. In 2013, ponded water was observed at the south-east base of the PRSF (sampling station ST-16). This was first reported in the 2013 Annual Report (as well as to regulators in July 2013) as a small volume of the seepage, with elevated levels of cyanide, nickel and copper (among other constituents) had migrated, through a rockfill perimeter road, to the near shore area of NP-2 Lake. Agnico determined, in 2013, that the seepage contained reclaim water from the North Cell TSF that had flowed under the PRSF to a sump area designated as sampling station ST-16 (refer to RSF Seepage Golder Report in Appendix G5 of the 2013 Annual Report).

Mitigation measures were implemented in since 2013 and this included daily inspections during the freshet period, the installation of a pumping system in ST-16 to direct accumulated water back to the North Cell TSF, installation of four thermistors to analyse freezing in the PRSF and installation of a filter barrier along RF-1 and 2 to prevent water and tailings egress from the North Cell (tailings water) through the PRSF to ST-16. As part of progressive reclamation capping of the North Cell tailings commenced in winter 2015 and continued in 2016. The North portion on the North Cell was capped in 2015 and a 30m strip was placed in front of RF1 and RF2 in 2016 to eventually connect to the 2015 capping in winter 2017. In 2017, capping of the North Cell with soapstone continued for areas that were located outside the tailings covered areas. Capping was placed on original ground along the Portage RSF western boundary and at the northern boundary of the cell to fill the gaps left during capping from previous years and the existing infrastructures around the cell. The capping was placed in these areas to prevent any tailings and contact water migration outside the North Cell perimeter. The tailings are capped in the area of RF-1 and RF-2 which assist to prevent any seepage migration from the North Cell.

Capping of the North Cell continued in 2018 in the area along the Stormwater Dike. A total of 1.2M m^3 of NPAG was placed as a tailings cover of the North Cell in 2018.

Also, as part of a tailings deposition optimisation program of the North Cell, an internal structure was built to allow for more tailings to be placed in the northernmost area of the cell. The construction of this infrastructure required 246,364 m^3 of NPAG material to be completed.

In 2018, 306,385 m^3 of North Cell water was transferred to the South Cell reclaim pond minimizing the water contained in this cell.

Thermistors installed in 2013 indicate that freezeback is occurring along the seepage path. Since 2014, a permanent pumping system has been operating at ST-16, to collect water and pump it to the TSF North Cell. Water volumes pumped from ST-16 and deposited in the North Cell TSF are provided in Table 8.12. Water volumes pumped in 2018 at ST-16 (12,606 m^3) was lower compared to the pumped volume of previous years 2014-2017 (Table 8.12 below). The installation of the filters at RF-1 and RF-2, capping of tailings and decreased water volume in the North Cell likely contributed to maintain the low volumes pumped. It is also an indication that mitigation measures have been effective in controlling and minimizing seepage from the North Cell.

Table 8.12. Waste Rock Seepage pumped volume 2014-2018

Year	Volume pumped (m^3)
2014	32,169
2015	19,236
2016	20,844
2017	25,815
2018	12,606

In accordance with the 2018 Freshet Action Plan (see Appendix D of the 2017 Water Management Report and Plan (Appendix 8), Agnico continued in 2018 to monitor water quality and contain the ST-16 Seepage. This is conducted to assess and prevent any impact to the receiving environment (NP2) and to downstream lakes (NP-1, Dogleg and Second Portage). Monitoring stations are illustrated on Figure 1. Water quality results can be found in Appendix 1 Table 8.13 for ST-16, Table 8.14 for NP2 South, Table 8.15 for NP2 West, Table 8.16 for NP2 East, Table 8.17 for NP2 Winter, Table 8.18 for NP1 West, Table 8.19 for Dogleg, Table 8.20 for Second Portage Lake. Average for parameters of concerns from 2014-2018 can be found in Tables 8.21 below, respectively. Results are presented for information purposes only as there are no applicable license limits at this location.

From 2014 to 2018, average analysis results for applicable parameters confirmed no impacts to downstream lakes (NP-1, Dogleg, Second Portage Lake). The average Nickel, Cyanide Free, Cyanide Total, Ammonia (NH_3) and Ammonia Nitrogen results are all below CCME, Water Licence and MDMER criteria in NP2 Lake from 2014 - 2018. In 2018, Copper is slightly elevated above CCME at NP2-South, East, West, and NP2-Winter (sample trough ice) but has shown a decrease compared to 2014 results.

Also, the 2018 results slightly decreased from 2017 analysis results for Ammonia Nitrogen CN Total and CN WAD at the receiving environment and the downstream lakes monitoring stations. From the results, the action plan implemented by Agnico has been very successful in preventing any further seepage into NP2 Lake and into the ST-16 sump itself. All seepage water are entirely contained inside the ST-16 sump. The MDRB has commented on the success of this action plan. The till plug, pumping system, installation of filters and effective tailings beaches at RF-1 and RF-2, progressive tailings capping at RF-1 and RF-2 and the dewatering of the North Cell in 2015 and 2016 have effectively mitigated this problem. In addition, thermistors installed in the RSF indicate freezing in the former seep path is occurring (which would mean that no water is migrating).

Table 8.21. 2014-2018 Monitoring Results for ST-16, NP2, NP1, Dogleg and Second Portage Lake

Parameters	Regulatory limit			Unit	Year	Stations							
	Water License	MDMER	CCME			ST-16	NP-2 South	NP-2 East	NP-2 West	NP-1 West	Dogleg North	SPL-RSF Seep	NP-2 Winter
Ammonia (NH3)	NA	NA	2.33 as N	mg N/L	2014	0.62	0.02	0.03	0.03	**0.01**	**0.01**	**0.01**	
					2015	0.01	**0.005**	**0.005**	**0.005**	**0.005**	**0.005**	**0.005**	**0.005**
					2016	0.0063	**0.005**	**0.005**	**0.005**	**0.005**	**0.005**	0.0063	**0.005**
					2017	**0.02**	**0.02**	**0.002**	**0.002**	**0.002**	**0.0015**	**0.002**	0.0143
					2018	**0.005**	**0.005**	0.015	**0.005**	**0.005**	**0.005**	**0.005**	**0.005**
Ammonia nitrogen (NH3-NH4)	32	NA	NA	mg N/L	2014	28.85	2.9	2.93	3.19	0.22	0.01	0.02	7.1
					2015	1.1	**0.005**	0.027	**0.005**	**0.005**	**0.005**	**0.005**	0.007
					2016	0.2775	0.0275	0.0325	0.07	0.0438	0.0438	0.025	0.135
					2017	0.305	0.0338	0.0313	0.0338	0.065	**0.025**	0.0338	0.08
					2018	0.077	0.025	0.017	0.03	0.03	0.025	0.0083	0.045
CN total	1	1	NA	mg/L	2014	1.38	0.02	0.01	0.01	0.003	**0.003**	**0.003**	0.03
					2015	0.02	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**
					2016	0.002	**0.0015**	**0.0015**	**0.0015**	**0.0015**	**0.0015**	0.0016	**0.0022**
					2017	0.0743	0.004	0.0045	0.0041	0.0023	0.005	0.0035	0.0086
					2018	0.002	**0.0005**	**0.0005**	**0.0005**	**0.0005**	0.0005	0.0007	**0.0005**
CN Free (SGS)	NA	NA	0.005	mg/L	2014	0.18	0.004	0.004	0.004	0.004	0.004	0.004	
					2015	**0.0025***	**0.0025***	**0.0025***	**0.0025***	**0.0025***	**0.0025***	**0.0025***	**0.0025**
					2016	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	0.0031	**0.0025**
					2017	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	0.0033

					2018	**0.0025**	**0.0025**	0.014	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**
CN WAD	NA	NA	NA	mg/L	2014	1.12	0.02	0.004	0.01	0.004	0.003	0.003	0.05
					2015	0.007	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**
					2016	**0.0015**	**0.0015**	**0.0015**	**0.0015**	**0.0015**	**0.0015**	0.0016	**0.0022**
					2017	0.0528	0.0029	0.003	0.0026	0.002	0.0028	0.0031	0.0016
					2018	0.001	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**
Copper	0.2	0.6	0.002	mg/L	2014	0.4871	0.0085	0.0076	0.0107	0.0021	0.0008	0.0006	0.034
					2015	0.047	0.005	0.006	0.005	0.0025	0.0004	**0.00025**	0.006
					2016	0.0259	0.005	0.0031	0.0034	0.0027	0.0013	0.0011	0.0062
					2017	0.0143	0.0029	0.0024	0.0023	0.0007	0.0004	0.0004	0.0044
					2018	0.016	0.0032	0.0024	0.0033	0.0018	0.0008	0.0004	0.0034
Nickel	0.4	1	0.025	mg/L	2014	0.4934	0.0134	0.0126	0.0138	0.0043	0.001	0.0006	0.036
					2015	0.05	0.005	0.009	0.005	0.0025	0.0005	**0.00025**	0.006
					2016	0.0369	0.0083	0.0056	0.0074	0.0047	0.0027	0.0066	0.0104
					2017	0.0176	0.0044	0.0042	0.0035	0.0021	0.0006	0.0003	0.0086
					2018	0.0160	0.0055	0.0058	0.0068	0.004	0.0017	0.0003	0.0083

Bold values correspond to half detection limits.

**Cn Free sample collected on August 18, 2015 was damaged during transportation. Therefore, it was not analysed. When Agnico noticed the situation, it was too late to collect another sample for the month.*

The KIA requested that Agnico continue monitoring until there is a 5 year period of non-detect cyanide results. To date (5 previous year), the monitoring indicated that yearly average for CN levels does not exceed the CCME guideline, the MDMER or Water License limit for effluent discharge into the environment for NP2, NP1 and downstream lakes, Dogleg and Second Portage. Thus, based on the analysis of the previous result, Agnico Eagle will suspend the current program in 2019.

8.5.3.1.8 North Portage Pit Sump (ST-17)

In 2011 a sump was constructed in the North Portage pit in an area of water accumulation. In 2018, due to safety issues in relation to the depth of the sump (no secure access), no water samples was collected. There was also no water pumped out the pit. Agnico Eagle will continue to maximize effort in ensuring that water sample will be collected during open water. The sampling location is illustrated on Figure 1. There are no applicable license limits.

8.5.3.1.9 South Portage Pit Sump (ST-19)

In 2018, water from the South Portage Pit sump was sampled in June and July during open water as per the requirements in the NWB Water License (sampling station ST-19 on Figure 1). Results are presented in Table 8.22 (Appendix 1). There are no applicable license limits.

With limited activity in South Pit, no water was transferred from the South Portage Pit Sump to the South Cell TSF in 2018, as in previous years.

8.5.3.1.10 Goose Island Pit Sump/Lake (ST-20)

In 2012 a sump was constructed in the Bay Goose pit in an area of water accumulation. Water that was collected in the Goose Pit sump was transferred to the South Cell TSF from January to June 2015. Mining activities have ceased in the Goose pit in April 2015. Starting in June 2015, no additional water was pumped out of the Bay Goose Pit; instead runoff and groundwater were kept in the pit to contribute to natural re-flooding of the pit. Planned reflooding activities were postponed to a subsequent year. Agnico will provide at least thirty (30) days' notice to the NWB and Inspector prior to the re-flooding as per Water License 2AM-MEA1526 Part E Item 12.

Seepage rates and volumes through the Bay Goose dike are not significant. No seepage collection system has been implemented because there is no evidence of significant seepage that had affected the mining operation or the dike integrity, and that warrants a collection system.

In 2018, Agnico collected two monthly water quality samples for August and September at the bottom of the pit at station ST-20 Goose Pit Lake. Results of sampling conducted at station ST-20 Goose Island Pit Lake are presented in Table 8.23 (Appendix 1); the sampling location is illustrated on Figure 1. Three samples were also collected monthly during open water from July to September as per the requirements in the NWB water license at a sump at the top of Bay Goose Pit (sampling station ST-20 Goose Pit Sump). The data are presented in Table 8.24 (Appendix 1), the sampling location is illustrated on Figure 1. There are no applicable license limits for ST-20 Goose Pit Sump and ST-20 Goose Pit Lake as the water was not directly released into the environment; the data is presented for information purposes only. Data analysis for samples collected at ST-20 Goose Island Pit Lake is presented in the 2018

Meadowbank Water Quality Forecasting Update (Appendix C of 2017 Water Management Report and Plan in Appendix 8).

8.5.3.1.11 Tailings Storage Facility (ST-21)

The North Cell Tailings Storage Facility became operational in February 2010. On November 17, 2014 the reclaim water intake was transferred from the North Cell TSF to the South Cell TSF. Tailings deposition was also stopped in the North Cell TSF and commenced in the South Cell TSF at that time. As per the NWB Water License, sampling station ST-21 changed location from the North to the South Cell. Sampling was conducted monthly as per the requirements of the NWB Water License. There are no applicable license limits for this station as the water is used as reclaim water at the mill. Sample results are presented in Table 8.25 (Appendix 1). The location of sampling station ST-21 (South Cell TSF) is illustrated on Figure 1. As per the water license, no more monitoring in the TSF North Cell is required.

8.5.3.1.12 Vault Pit Sump (ST-23)

In 2014 a sump was constructed in the Vault pit in an area of water accumulation. Water from the Vault Pit is to be sampled monthly during open water as per the requirements in the NWB water license. In 2018 water from Vault Pit sump (Table 8.26 (Appendix 1) was sampled monthly during open water as per the requirements in the NWB Water License (sampling station ST-23 on Figure 1). Agnico Eagle will continue to maximize efforts in ensuring that water sample will be collected in open water season month. The water accumulated in the Vault Pit sump was pumped to the Vault Attenuation Pond. A total volume of 92,858 m^3 was transferred in 2018 from June to October. There are no applicable license limits for ST-23.

8.5.3.1.13 Vault Rock Storage Facility (ST-24)

The Vault Waste Rock Storage Facility (VRSF) has been in operation since 2013. As in the past, ponded water was observed at the base of the VRSF (sampling station ST-24). In 2018, water was sampled only in June, July and August. As per NWB Water License, samples were collected to assess water quality and the results are presented in Table 8.27 (Appendix 1). No water was pumped from this location as it is mainly a ponding area without flow and will dry-up during warmer months. There are no applicable license limits at this location as there is no discharge to the environment; the data is presented for information purposes only. The location of this sampling station (ST-24) is illustrated on Figure 3.

8.5.3.1.14 Vault Attenuation Pond (ST-25)

Surface water was sampled monthly during open water from the Vault Attenuation Pond as per the requirements in the NWB Type A Water License (sampling station ST-25). There are no applicable license limits. The data is presented in Table 8.28 (Appendix 1) for information purposes only. The location of sampling station ST-25 is illustrated on Figure 3. There was on water pumped out from the Vault Attenuation Pond to Wally Lake in 2018.

8.5.3.1.15 PRSF – Waste Extension Pool (WEP/ ST-30 and ST-31)

In 2014, as per inspections conducted within the framework of the Freshet Action Plan, run off was noted at the northeast side of the NPAG waste rock extension pile in a natural depression (WEP). Agnico contained this run off and pumped it back to the North Cell TSF as a precaution and to prevent egress to the East Diversion non-contact water ditch. In 2018, 22,092 m^3 of water was pumped from the WEP collection system to the North Cell TSF which includes 13,923 m^3 of water from WEP1 and 8,169 m^3 from WEP2. The water from the WEP collection system is pumped to the ST-16 sump system, and the pumped to the North Cell TSF.

In 2016 and 2017, respectively 5,496 m^3 and 24,738 m^3 of water was pumped from the WEP collection system to the North Cell TSF. The similar volume of 2018 and 2017 is closely related to snow and freshet conditions and overall effectiveness of the WEP sumps in collecting water. Table 8.31 below provide 2016 – 2018 pumped volume for WEP1 and WEP2

Table 8.31 Meadowbank 2016 -2018 volume of water pumped from WEP 1 and WEP 2

Years	WEP 1 pumped volume (m^3)	WEP 2 pumped volume (m^3)
2016	3,694	1,802
2017	14,456	10,282
2018	13,923	8,169

WEP1 and WEP2 sumps were constructed in September 2015 (Appendix G4 of the 2015 Annual Report) to better manage water around the northeast side of the PRSF and to ensure that all water ponding behind the PRSF is transferred back to the North Cell TSF (and eventually transferred to the South Cell). The sumps WEP1 and WEP2 have replaced the natural depression forming the former WEP for the water management in this area. Sumps locations are illustrated on Appendix G4 of the 2015 Annual Report. Sampling have commence in 2016 at sumps WEP1 and WEP2 as per NWB Water License 2AM-MEA1525. There are no applicable license limits. The sampling location is illustrated on Figure 1 and results are presented in Table 8.29 (Appendix 1) for WEP1 (ST-30) and Table 8.30 (Appendix 1) for WEP 2 (ST-31).

Results of samples collected in 2018 at station ST-5 (East Diversion ditch discharge point into NP2) are documented in Table 8.8 (Appendix 1). The results from summer 2018 show that no water coming from the former WEP collection system was in contact with the East Diversion ditch. Agnico will continue to monitor the area and will ensure that water collected in WEP1 and WEP2 sumps are pumped back into the North Cell TSF.

8.5.3.1.16 Saddle Dam 3 (ST-32)

Water accumulated at the base of Saddle Dam 3 was pumped into the South Cell TSF (21,962 m^3 in 2018). This water originates from non-contact surface runoff from the surrounding terrain. Water samples were collected during the open water season to assess water quality. There are no applicable license limits for this location as the water was not being released into the environment; the data is presented in Table 8.32 (Appendix 1) for information purposes only. The sampling location (ST-32) is illustrated on Figure 1. Water accumulation at the toe of Saddle Dam 3 does not have any consequence on the integrity of the TSF infrastructure. As stated previously, water was pumped back to the South Cell TSF as a mitigation measure. Inspections continue to be held at this location on a weekly basis to ensure conformity. Table 8.33 below provide 2016 – 2018 pumped volume from ST-32

Table 8.33. Meadowbank. 2016 -2018 volume of water pumped from ST-32

Years	ST-32 pumped volume (m^3)
2016	22,095
2017	16,061
2018	21,962

8.5.3.1.17 Saddle Dam 1 (ST-S-2)

Water accumulated at the base of Saddle Dam 1 was pumped into the North Cell TSF (3,626 m^3 in 2018). This water originates from non-contact surface runoff from the surrounding terrain because of the topography. Water samples were collected during the open water season to assess water quality. There are no applicable license limits for this location as the water was not being released into the environment; the data is presented in Table 8.34 (Appendix 1) for information purposes only. The sampling location (ST-S-2) is illustrated on Figure 1. The water accumulation at the toe of Saddle Dam 1 does not have any major consequence on the integrity of the TSF infrastructure, as the water is pumped and properly managed. As said previously, waster was pumped back to the North Cell TSF as a mitigation measure. Inspection continues to be held at this location on a weekly basis to ensure conformity. Table 8.35 below provide 2015 – 2018 pumped volume from ST-S-2

Table 8.35. Meadowbank 2015 -2018 volume of water pumped from ST-S-2

Years	ST-S-2 pumped volume (m^3)
2015	7,185
2016	15,960
2017	13,102
2018	3,626

8.5.3.1.18 Central Dike Seepage (ST-S-5)

Sampling was conducted monthly as per the requirements of the NWB water license. There are no applicable license limits for this station as the water is pumped back to the South Cell TSF. Sample results are presented in Table 8.36 (Appendix 1). See Figure 1 for the location of ST-S-5. A total of 2,306,360 m^3 of water was pumped in 2018 from this sump. Pumped out in 2018 is lower than in 2017 (4,366,869 m^3) and 2016 (4,597,688 m^3) due to reduction in seepage rate. In 2018, the totality of the water was transferred from the Central Dike Seepage Sump to the South Cell TSF. Refer to Section 8.5.8.1.22 for details on the Central Dike seepage regarding consequence and mitigation measure in place. Table 8.37 below provide 2015 – 2018 pumped volume from ST-S-5

Table8.37. Meadowbank 2015 -2018 volume of water pumped from ST-S-5

Years	ST-S-5 pumped volume (m^3)
2015	2,948,024
2016	4,597,688
2017	4,699,046
2018	2,306,369

8.5.3.1.19 Phaser Pit Sump (ST-41)

Following mining activities in Phaser Pit, a new monitoring station was established in July 2018 for Phaser Pit sump (ST-41). This station was officially added and communicated to CIRNAC's inspector on July 4th, 2018. The Phaser Pit Sump was constructed during 2018 operation to manage the water runoff from the pit. Monthly samples has been conducted during open water season as per the requirements of the NWB Water License. There are no applicable license limits. The data is presented in Table 8.38 (Appendix 1) . Sampling station ST-41 is illustrated on Figure 3. A total of 23,053 m^3 of water was transferred to Phaser Attenuation Pond from June to September 2018.

8.5.3.1.20 BB Phaser Pit Sump (ST-42)

Following mining activities in BB Phaser Pit, a few monitoring station was established in July 2018 for BB Phaser Pit Sump. This station was officially added and communicated with CIRNAC''s inspector on July 4th, 2018 . The BB Phaser Pit Sump was constructed during 2018 operation to manage the water runoff from the pit. Monthly samples has been conducted during open water season as per the requirements of the NWB water license. There are no applicable license limits. The data is presented in Table 8.39 (Appendix 1) . Sampling station ST-42 is illustrated on Figure 3. A total of 37,558 m^3 of water was transferred to Phaser Attenuation Pond from June to September 2018.

8.5.3.1.21 Phaser Attenuation Pond (ST-43)

During 2018, water from Phaser et BB Phaser Pit Sumps was pumped and transferred to Phaser Attenuation Pond (ST-43) This monitoring station was created and communicated to CIRNAC's inspector on July 4th, 2018. Water accumulated in Phaser Attenuation pond was transferred to the Vault Attenuation pond. A total of 125,207 m^3 was transferred in 2018. Monthly samples have been conducted during open water season as per the requirements of the NWB Water License. There are no applicable license limits. The data is presented in Table 8.40 (Appendix 1) . Sampling station ST-43 is illustrated on Figure 3.

8.5.3.1.22 Landfarm

Meadowbank's first landfarm (Landfarm 1) is located on the north-west side of the South Tailings Cell (Tailing Storage Facility; TSF) is currently flooded and is now inactive. Landfarm 2 was constructed in 2016, contaminated soil was added 2017 and 2018. In 2018, some water runoff was identified at the landfarm 2 in June 2018 but there was not sufficient volume to sample, or to require mitigative action, particularly since the direction of flow was directly towards the adjacent TSF.

8.5.3.1.23 Landfill

No water quality monitoring was completed at the landfill in 2018 as no leachate was observed. The total volume of waste transferred to the landfill in 2018 was 15,819 m^3. A monthly summary of the solid waste disposed at the landfill is presented in Table 6.2.

8.5.3.2 Whale Tail Site

8.5.3.2.1 Waste Rock Storage Facility (WRSF) Pond (ST-WT-3)

In 2018, a small amount of water was observed at the base of the Whale Tail Stage 1 WRSF in September. Two (2) water samples has been taken and the data is presented in Table 8.41 (Appendix 1) . There are no applicable license limits. Sampling station ST-WT-3 is illustrated on Figure 4. No water was transferred from this pond in 2018.

8.5.3.2.2 Lake A47 (ST-WT-6)

In 2018, water from the Lake A47 (ST-WT-6) was sampled in August during open water as per the requirements in the NWB Water License (sampling station ST-WT-6 on Figure 4). There are no applicable license limits. Results are presented in Table 8.42 (Appendix 1).

8.5.3.2.3 Lake A16 outlet (ST-WT-14)

In 2018, water from the Lake A16 outlet (ST-WT-14) was sampled in August during open water as per the requirements in the NWB Water License (sampling station ST-WT-14 on Figure 4). There are no applicable license limits. Results are presented in Table 8.43 (Appendix 1).

8.5.3.2.4 Lake A15 (ST-WT-15)

In 2018, water from the Lake A15 (ST-WT-15) was sampled in August during open water as per the requirements in the NWB Water License (sampling station ST-WT-15 on Figure 4). There are no applicable license limits. Results are presented in Table 8.44 (Appendix1).

8.5.3.2.5 Effluent discharged from AP-5 and Trench-water Containment Pond (ST-WT-MEA-4)

As per Water License 2BB-MEA1828 Part D Item 17, a 10 days' notice was sent to CIRNAC's Inspector on September 10 and September 28 to advise the pumping of AP-5 containment pool to the tundra. Flow dissipaters were put in place at the discharge locations to prohibit erosion from the discharge. The discharge met discharge criteria in accordance with Part D, Item 14 of the NWB Water License. Pre-discharge samples were taken on September 4th and October 1st and result are provided in Table 8.45 (Appendix 1). Weekly samples were taken during discharge. No non-compliance were observed during discharge.

8.5.3.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6d: ***Tabular summary of all data generated under the Monitoring Program, Part J***

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 9: ***The Licensee shall establish background and post drilling water quality for pH, conductivity, temperature and dissolved oxygen at the nearest downstream water body to drill locations. Monitoring is to be done just prior to commencement of drilling and weekly thereafter, concluding one week after drilling has been completed and the site restored.***

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 10: ***The Licensee shall obtain representative samples of the water column below any ice where required under Part F, Items 9 and 10. Monitoring shall include, at a minimum, the following Physical Parameters (pH, electrical conductivity, total suspended: solids), Major Ions (Calcium, chloride, magnesium, potassium, sodium, sulphate), Total Metals (Aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, titanium, uranium, vanadium and zinc).***

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 11: ***The Licensee shall establish baseline water quality conditions prior to drilling within thirty-one (31) metres of the ordinary High Water Mark as per Part F, Items 2 and 3. Monitoring shall include the following: Physical Parameters (pH, electrical conductivity, total suspended solids, turbidity). Major Ions (Calcium, chloride, magnesium, potassium, sodium, sulphate) Total***

Metals (Aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, titanium, uranium, vanadium and zinc)

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 12: ***The Licensee shall, where turbidity is observed in adjacent waters or waters immediately downstream of any drilling program conducted within thirty-one (31) metres of the ordinary High Water Mark of any water body, during summer following any such drilling program as per Part F, Item 5 (c), conduct additional monitoring of the parameters listed in Part J, Item 10 to determine whether any further mitigation is required.)***

All results related to drilling on ice and/or within 31 m of the above high water marks can be found in Table 8.46 (Appendix 1).

Holes drilled within thirty-one metres of the ordinary High Water Mark were drilled during the winter period in the vicinity of lakes where drilling on ice occurred. Sampling analysis data is compiled with drilling on ice sample results, on Table 8.46 (Appendix 1).

No turbidity was observed in adjacent water or waters immediately downstream of drilling sites. The drilling waste (cutting) was disposed of at least 31 meters from the water body in a natural depression where direct flow into water body is not possible.

8.5.4 Sewage Treatment Plant

8.5.4.1 Meadowbank Site

The Meadowbank mine site has one Seprotech L333 sewage treatment plant (STP) and three Little John 100 units in operation; the equipment operates together with one sewage discharge effluent stream directed to the Stormwater Management Pond (SMP). In 2018, water was pumped from the SMP to the South Cell TSF in June, July and September. There is no discharge to any receiving waters. The SMP also collects spring runoff from the surrounding area.

Samples are taken in accordance with Operation & Maintenance Manual – Sewage Treatment Plan for the purpose of determining operating efficiency of the units. Sample results are available in Table 8.47 (Appendix 1). Results of the sample analysis are submitted to the NWB in the monthly monitoring reports.

The total volume of treated sewage discharged in 2018 was 30,913 m^3. In addition, 307 m^3 of sewage sludge was collected and disposed of in the Tailings Storage Facility. A monthly summary of the volume of STP waste is presented in Table 8.48 (Appendix 1).

8.5.4.2 Whale Tail Site

There was no sewage treatment plan associated with NWB Water License 2AM-WTP1826 in 2018. The 60 days notice was sent for STP construction on December 21st, 2018 and approved on January 24th, 2019. The commissioning for the operation STP should be in Q2 2019.

8.5.4.3 Exploration Whale Tail Site

For the Whale Tail project, two different Sewage Treatment Plant systems have been in operation during 2018. Due to the limited system capacity and the increase number of employee, the Bionest system was decommissioned and replaced by the Newterra system. In accordance with the 2BB-MEA1828, the Newterra As-built has been submitted on March 28th, 2018 The document can be found in Appendix 35.

Effluent from the Sewage Treatment Plan (STP) has been discharged to the Whale Tail Lake North Basin and monitoring has been conducted as per the Water License 2BB-MEA1828 Part D Item 10. Agnico considers the camp and all the facilities associated to be Amaruq Exploration Camp. According to Water Licence 2BB-MEA1828: Part J Item 2, sample results (MEA-2) are available in Table.8.49 (Appendix 1).

The following exceedance were observed in 2018:

- A Fecal coliform exceedance occurred on January 29th, 2018 and was reported to the Government of Nunavut Spill Line. The sample had a concentration of 3,300 CFU/100 ml (Water licence 2BB-MEA1318 limit:1000 CFU/100ml). The five previous sampling results were showing <3 CFU/100ml. A faulty UV system could have led to this exceedance

- Oil and grease exceedance occurred on May 14th, 2018 and was reported to the Government of Nunavut Spill Line. The sample had a concentration of 29 mg/L (Water licence 2BB-MEA1318 limit:5 mg/L). The five previous sampling results were showing <1 mg/L. The exceedance may be due to a fault of the kitchen grease trap system.

- pH exceedance occurred on September 24th and October 2nd, 2018. The sample had a pH of 5.89 and 5.45 (Water licence 2BB-MEA1318 limit:6-9.6).

- Oil and grease exceedance occurred on November 19th, 2018. The sample had a concentration of 6.1 mg/L (Water licence 2BB-MEA1318 limit:5 mg/L. The five previous sampling results were all below detection limit. The exceedance may be due to a fault of the kitchen grease trap system.

The total volume of treated sewage discharged in 2018 was 11,212 m^3 (Bionest system from January to April: 1,948.5m^3 and the Newterra system from May to December: 9,263.5 m^3). In addition, 100 m^3 of sewage sludge and 11 m^3 of grease were collected and transported to the Meadowbank Tailings Storage Facility. Monthly discharge summary is presented in Table 8.50 (Appendix 1) as required by 2BB-MEA1828 Part B Item 6.

The Bionest system will be re-used in 2019 during the transfer of the employees from the temporary to the permanent camp.

8.5.5 Bulk Fuel Storage Facility

8.5.5.1 Meadowbank Site

Water collected in the secondary containment area of the bulk fuel storage tank at the Meadowbank mine site was sampled on June 11th, 2018. Results are presented in Table 8.51 (Appendix 1). and the sampling location (ST-37) is illustrated on Figure 1. No water quality parameters exceeded the water quality limit stipulated in Part F, Item 8 of the 2AM-MEA1526 Water License. Notification to the CIRNAC Inspector, made in accordance with Part F, Item 12 of NWB License 2AM-MEA1526 to empty the secondary containment area, was sent June 12th , 2018. As a result, 250 m^3 of water was discharged to the

Stormwater Management Pond via a temporary pipe from the secondary containment area of the Meadowbank bulk fuel storage tank.

8.5.5.2 Baker Lake Marshalling Facilities

Water collected in the secondary containment areas of the main (Tanks 1 – 4; ST-40.1) and additional (Tanks 5 - 6; ST-40.2) diesel bulk fuel storage facilities at the Baker Lake Marshalling Facility were sampled in June and September 2018. Notification to the CIRNAC Inspector, made in accordance with Part F, Item 12 of NWB License 2AM-MEA1526 to empty secondary containment areas, was sent on June 12th, 2018 for ST-40.1. and ST-40.2. Approximately 13,600 m^3 of water was discharged from secondary containment Tank 1 to 4 (ST-40.2) to the tundra in June and 4,200 m^3 was discharged from ST-40.1 in July. The use of silt bags to transfer water from Tank 5-6 to containment of Tank 1-4 were not necessary in 2018 as the results were compliant with the discharge limits.

No notification was required to the CIRNAC Inspector in September as no discharge occurred. The water froze after the sampling session. The locations of these sampling stations (ST-40.1 and ST-40.2) are illustrated on Figure 6 and results are presented in Table 8.52 (Appendix 1).

As for 2017, the Jet A secondary containment water (ST-38) was sampled internally for TSS levels as visual inspections noted coloration and sediment in the water contained within the Jet A tanks area. TSS levels always exceeded the regulatory limit of 30 mg/L. For this reason, no water from the secondary containment of the Jet-A was discharged to the receiving environment in 2017. The water was either pumped in a water truck and discharged to the Meadowbank Stormwater Pond or thru a silt bag into secondary containment of diesel tank 5-6 (an estimated 1,030 m^3 of water was removed). This way, Agnico eliminated TSS and water quality became acceptable for discharge. Following this transfer, no water was discharge to the receiving environment without another regulatory sampling being completed. The sampling location is illustrated in Figure 4

In 2018, no sample has been taken from the Jet A secondary containment water (ST-38) as a visual inspections noted coloration and sediment. TSS levels always exceeded the regulatory limit of 30 mg/L since. For this reason, no water from the secondary containment of the Jet-A was discharged to the receiving environment in 2018. The water was pumped in a water truck and discharged to the Meadowbank Stormwater Pond (an estimated 45 m^3 of water was removed). The sampling location is illustrated in Figure 6.

As part of the Core Receiving Environment Monitoring Program (CREMP), water quality samples are collected at stations on Baker Lake during the open water season. Four monitoring stations are sampled; one at the Baker Lake community barge dock, one at the Baker Lake marshalling area, and two at upstream reference locations. For more details, please refer to the report entitled ''Core Receiving Environment Monitoring Program 2018" prepared for Agnico by Azimuth Consulting Group, attached as Appendix 31. The results indicate no effects from mine related activities.

8.5.5.3 Whale Tail Site

There is no water sampling from tank farm with Water License 2AM-WTP1826 in 2018 as the tank farm were not constructed.

8.5.5.4 Exploration Whale Tail Site

There were no samples associated with tank farm under 2BB-MEA1828 in 2018.

8.5.6 All Weather Access Road (AWAR)/ Whale Tail Haul Road and Quarries*

8.5.6.1 Meadowbank Site

As required by DFO Authorizations NU-03-0190 Condition 5.3 (AWPAR); ***A photographic record of before, during and after construction, during decommissioning and after restoration, showing that all works and undertakings have been completed according to the approved Plan and conditions of this authorization […]***

A geotechnical structural inspection of the AWAR, including all culverts, bridges and quarries, was conducted by Golder Associates in 2018. This annual inspection is a requirement of the Water License. The findings are presented in the report entitled '2018 Annual Geotechnical Inspection, Meadowbank Gold Mine, Nunavut', attached in Appendix 7. Agnico responses to the recommendations from the inspection are also included in Appendix 11.

In relation to Fisheries and Oceans Canada (DFO) Authorizations NU-03-0190, NU-03-0191.3, NU-03-0191.4, NU-08-0013 and NU-14-1046 Agnico maintains a Habitat Compensation Monitoring Plan (Version 4, 2017) to ensure that fish habitat compensation features are constructed and functioning as intended. Based on the schedule described in the Habitat Compensation Monitoring Plan (HCMP), monitoring of compensation features currently occurs every 2 years. Monitoring was conducted in 2017 for the constructed spawning pad, located at stream crossing R02 along the all-weather access road. The constructed spawning pads were visually confirmed to be stable as designed. The next monitoring is planned for the summer of 2019. Complete details can be found in the 2017 HCMP report found at Appendix G5 of the 2017 Annual Report.

Pre-freshet and freshet inspections were conducted at crossings along the AWAR in 2018. These inspections are conducted to document the presence/absence of flow, erosional concerns and turbidity plumes. No flow was observed during the first inspection conducted on June 5th, 2018. Flow was observed, but no erosional concern or visual turbidity plumes were observed during the freshet inspections conducted on June 8th, June 29th, July 6th and July 27th, 2018. Inspection reports can be found in Appendix 36.

Weekly inspections are also conducted along the AWAR on a year round basis. During the freshet and open water season, any visual turbidity plumes or erosion along the AWAR, culverts or HADD crossings are documented by Environmental Technicians. In 2018, no visual turbidity plumes or erosion was observed.

8.5.6.2 Whale Tail Site

A geotechnical structural inspection of the Whale Tail Haul Road, including all culverts, bridges, eskers and quarries, was conducted by Golder Associates in 2018. This annual inspection is a requirement of the Water License. The findings are presented in the report entitled '2018 Annual Geotechnical Inspection, Meadowbank Gold Mine, Nunavut', attached in Appendix 71. Agnico responses to the recommendations from the inspection are also included in Appendix 11.

Pre-freshet and freshet inspections were conducted at crossings along the Whale Tail Haul Road, eskers and quarries in 2018. These inspections are conducted to document the presence/absence of flow, erosional concerns and turbidity plumes and to ensure that runoff, if any, would be free of any visible

* TSM- Biodiversity and Conservation Management

sheen and would not impact the environment. A freshet leader was hired in 2018 and was only dedicated to the inspection of Whale Tail Haul Road including the esker, quarries, culvert and bridges. If needed, mitigation measures, as straw boom or turbidity barrier, were put in place as prevention measures. No issues with runoff water inside the eskers/quarries, culvert or bridge to any waterbodies were noted in 2018.

Weekly inspections are also conducted along the Whale Tail Haul Road and eskers/quarries on a year round basis. During the freshet and open water season, any visual turbidity plumes or erosion along the road, culverts, bridge or eskers/quarries are documented by Environmental Technicians. In 2018, no visual turbidity plumes or erosion was observed.

8.5.6.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part J, Item 13: ***The Licensee shall monitor runoff and/or discharge from the quarry sites to receiving environment, during blasting activities, during periods of flow and following significant precipitation events, on a monthly basis, for the following parameters:***

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 15: ***The Licensee shall implement a water crossings visual inspection and maintenance program prior to, during spring freshet and after heavy rainfall events to identify issues related to watercourse crossings structural integrity and hydraulic function***

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 14: ***The Licensee shall, during periods of flow and just after a major rainfall event, conduct water quality testing immediately upstream and downstream of the water crossings, any significant water seeps in contact with the road and any flows originating from borrow pits or rock quarries on a monthly basis prior to construction, during the construction and upon completion for the parameters listed under Part J, Item 11.***

In 2018, no runoff from quarry on site to the receiving environment were observed.

Sampling of the water crossing 181 was conducted on June 26, 2018 and results are provided in Table 8.53 (Appendix 1). No alteration of the water quality was observed between upstream and downstream samples.

No issue related to watercourse crossing's structural integrity or hydraulic function was seen in 2018 during the inspections of the water crossing 181.

8.5.7 QAQC Sampling

As required by NIRB Project Certificate No.004, Condition 23: ***ensure that water quality monitoring performed at locations within receiving waters that allow for an assimilative capacity assessment of concern to regulators, be carried out by an independent contractor and submitted to an independent accredited lab for analysis, on a type and frequency basis as determined by the NWB; results of analysis shall be provided to the NWB and NIRB's Monitoring Officer.***

And

As required by NWB Water License 2AM-MEA1526 Part I, Item 17: ***The Licensee shall annually review the approved QA/QC Plan and modify the Plan as necessary. Proposed changes shall be submitted to an Accredited Laboratory for approval.***

And

As required by NWB Water License 2AM-WTP1826 Part I, Item 20: ***The Licensee shall annually review the approved QA/QC Plan and modify the Plan as necessary. Proposed changes shall be submitted to an Accredited Laboratory for approval.***

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 for Meadowbank and Whale Tail Sites were performed by H2Lab in Val d'Or, Quebec, an accredited facility. All data from H2Lab underwent a vigorous internal QA/QC process, including the use of spiked samples and duplicate samples. All QA/QC data passed the laboratories acceptable limits. The laboratory certificates of quality control are presented in Appendix 29 for Meadowbank and Appendix 30 for Whale Tail, following the corresponding certificates of analysis.

All toxicity tests were performed by Eurofins in Québec and sublethal toxicity by Aquatox in Ontario. Testing was conducted as stipulated in the corresponding Environment Canada Biological Test Methods. QA/QC measures implemented by the lab, including the use of reference toxicants, met the acceptable limits. QA/QC data is presented with the toxicity reports in Appendix 29 for Meadowbank and Appendix 30 for Whale Tail.

Field blanks are laboratory bottles filled with deionized water in the field, and then treated as a normal sample. They are used to identify errors or contamination in sample collection and analysis. Duplicate field water quality samples are collected simultaneously in the field and used to assess sampling variability and sample homogeneity.

The QAQC Plan was revised in March 2019 and the new version 4 is submitted as part of the 2018 Annual Report. The updated version includes the requirement for Whale Tail site.

8.5.7.1 Meadowbank Site

The following presents the percentage of duplicate and field samples collected from each of the monitoring programs:

- MDMER and EEM monitoring programs: 6 duplicate samples and 7 field blanks were collected from a total of 53 samples, representing 11.3 %;

- STP monitoring program: 6 duplicate samples and 1 field blank were collected from a total of 36 samples, representing 16.7%;

- Surface water monitoring programs: 30 duplicate samples and 14 field blanks were collected from a total of 107 samples, representing 28.0%; and

- Bulk fuel storage facilities monitoring program: 5 duplicate samples were collected from a total of 5 samples, representing 80.0%.

This represents approximately 23.4% of the samples collected, which is higher than the QA/QC duplicate program objective of 10%.

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 = field sample; B = duplicate sample.

Large variations in RPD values are often observed between duplicate samples when the concentrations of analytes are low and approaching the detection limit. Consequently, a RPD of 20% for concentrations of field and duplicates samples that both exceed 10x the method detection limit (MDL) is considered notable. The analytical precision of one QAQC sampling event is characterized as:

- High, when less than 10% of the parameters have variations that are notable;

- Medium, when 10 to 30% of the parameters have variations that are notable;

- Low, when more than 30% of the parameters have variations that are notable.

Results of the QA/QC data are presented in Tables 8.54 to 8.87 (Appendix 1) for the MDMER and EEM, STP, Surface Water, and Bulk Fuel Storage Facility monitoring programs, respectively. The following is a brief summary of the QA/QC results, per sampling program:

- MDMER and EEM (Tables 8.54 and 8.55 (Appendix 1)): All the duplicate samples collected were considered as having high analytical precision. Only one duplicate sample shows medium analytical precision with a relative percent difference of 20%.

- STP (Table 8.56 (Appendix 1)): Analytical precision is rated high for two sampling event and medium for four sampling event. However, as the number of parameters analysed is low, one sample with notable variation between field and duplicate samples will trigger a medium analytical precision.

- Surface Water (Tables 8.57 – 8.70 and 8.74- 883 (Appendix 1)): All QAQC sampling events conducted within the surface water quality program are rated as having high analytical precision except for 2 samples having a medium analytical precision between 18% and 22%.

- Bulk Fuel Storage Facility (Table 8.71 – 8.73 (Appendix 1)): Analytical precision is rated high for the duplicate sampling event conducted at the Bulk Storage Facility.

The QA/QC plan was followed and samples were collected by qualified technicians. Given the high number of samples collected in 2018, it is common to have some RPD exceedances as a result of the discrete differences in the original and field duplicates. Given the variability of these exceedances (occurring with different parameters, on different dates for different sampling programs) and the high number of successful samples, it is evident that field QA/QC standards during water sampling were maintained during sampling in 2018. Agnico technicians will continue to follow standard QA/QC procedures for surface water sampling that requires the use of sample bottles that are provided by an accredited laboratory, proper handling and storage of bottles to prevent cross-contamination between areas and, if appropriate, thoroughly rinsing the sample containers with sample water prior to sample collection.

For field measurements, the following equipment is used:

- Hach Meter (turbidity);
- Oakton PCS35 Meter (pH and conductivity);
- Hoskin Scientific (pH);
- Eureka Mantha 20+ Meter (pH, dissolved oxygen and conductivity)

The calibration data regarding these instruments is presented in Tables 8.88 to 8.91 (Appendix 1) for Hach meter, the Oakton PCS35, Hoskin Scientific meter and Eureka Mantra+ meter, respectively.

QA/QC 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 31: *Core Receiving Environment Monitoring Program 2018* – Sections 3;
- Appendix 37: *2018 Groundwater factual report* – Sections 2.5;
- Appendix 39: *Air Quality and Dustfall Monitoring Report 2018*– Section 4.4.

8.5.7.2 Whale Tail Site

The following presents the percentage of duplicate and field samples collected from each of the monitoring programs:

- MDMER and EEM monitoring programs: 3 duplicate samples and 3 field blanks were collected from a total of 8 samples, representing 37.5%;
- STP monitoring program: 7 duplicate samples were collected from a total of 50 samples, representing 14.0%; and
- Surface water monitoring programs: 3 duplicate samples and 3 field blanks were collected from a total of 5 samples, representing 60%;
- This represents approximately 23.4% of the samples collected, which is higher than the QA/QC duplicate program objective of 10%.

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 = field sample; B = duplicate sample.

Large variations in RPD values are often observed between duplicate samples when the concentrations of analytes are low and approaching the detection limit. Consequently, a RPD of 20% for concentrations of field and duplicates samples that both exceed 10x the method detection limit (MDL) is considered notable. The analytical precision of one QAQC sampling event is characterized as:

- High, when less than 10% of the parameters have variations that are notable;
- Medium, when 10 to 30% of the parameters have variations that are notable;
- Low, when more than 30% of the parameters have variations that are notable.

Results of the QA/QC data are presented in Tables 8.92 to 8.96 (Appendix 1) for the MDMER and EEM, STP and Surface Water, respectively. The following is a brief summary of the QA/QC results, per sampling program:

- EEM (Tables 8.92 (Appendix 1)): All the duplicate samples collected were considered as having high analytical precision.
- STP (Table 8.93 (Appendix 1)): Analytical precision is rated high for one sampling event, medium for two sampling event (16.7%) and low for one sampling event (33.3%). However, as the number of parameters analysed is low (only 6 parameters), one sample with notable variation between field and duplicate samples will trigger a medium analytical precision..
- Surface Water (Tables 8.94 -8.96 (Appendix 1)): All QAQC sampling events conducted within the surface water quality program are rated as having high analytical precision.

The QA/QC plan was followed and samples were collected by qualified technicians. It is common to have some RPD exceedances as a result of the discrete differences in the original and field duplicates. Given the variability of these exceedances (occurring with different parameters, on different dates for different sampling programs) and the high number of successful samples, it is evident that field QA/QC standards during water sampling were maintained during sampling in 2018. Agnico technicians will continue to follow standard QA/QC procedures for surface water sampling that requires the use of sample bottles that are provided by an accredited laboratory, proper handling and storage of bottles to prevent cross-contamination between areas and, if appropriate, thoroughly rinsing the sample containers with sample water prior to sample collection.

For field measurements, the following equipment is used:

- Hach Meter (turbidity);
- Eureka Mantha 20+ Meter (pH, dissolved oxygen and conductivity);
- Eureka Mantha 30+ Meter (pH, dissolved oxygen, turbidity and conductivity)

The calibration data regarding the Eureka Mantra 30+ meter is presented in Tables 8.97 and the data are recorded only starting in August 2018. Agnico have implemented at the end of 2018 and fully operational in Q1 2019 the EQuiS database. All calibrations data will be recorded there so all data should be tracked for all field measurement tool.

QA/QC 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 31: *Core Receiving Environment Monitoring Program 2018* – Sections 3;
- Appendix 38: *2018 Groundwater Monitoring and Management Report*– Sections 5;
- Appendix 39: *Air Quality and Dustfall Monitoring Report 2018*– Section 4.4.

8.5.8 Seepage

8.5.8.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Part I, Item 14: *The results and interpretation of the Seepage Monitoring program in accordance with Part I, Item 13*
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;
Permafrost Aggradation;
Mill Seepage.

And

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 10*: Summary of quantities and analysis of seepage and runoff monitoring from the Landfills, Waste Rock Storage Facility and Central Dike.*

8.5.8.1.1 Lake water seepage through dewatering dikes

As discussed previously, see Sections 8.5.3.1.3 regarding East Dike seepage interpretation and monitoring. More information can also be found in the Water Management Report and Plan in Appendix 8.

Seepage flow at East Dike is measured by the flow meters installed in the two seepage collection sumps downstream of East Dike. The average flow measured during the year 2018 was estimated to be around 419 m^3/day with peak activity averaging approximately 558 m^3/day in August 2018. The measured flow is slightly decreasing compared to values from the past years. During the year, the water quality in the sump was monitored by the environment department, and every week during freshet. According to the procedure in place, the water was pumped in Portage Pit instead of being sent to Second Portage Lake when the TSS criterion is exceeded or trending up. This was the case starting from June 3rd 2018 to August 21st 2018. After this period, the seepage water was pumped back to Second Portage Lake.

Seepage channel at the toe of Bay-Goose can be observed in the summer. That water naturally reports to the Bay-Goose Pit and is not managed by pumping. Agnico conducts punctual flow monitoring at a predetermined location to get an estimate of the seepage evolution. The flow in the channels is measured punctually using a bucket and a stopwatch (averaging between 5 and 15 m^3/day). The reading frequency is approximately once per week during summer time.

8.5.8.1.2 Seepage (of any kind) through Central Dike

As mentioned in Section 3.1.1c of this report, seepage was observed at the downstream toe of Central Dike since the fall period of 2014. The seepage appeared to be of low magnitude and of small volume. Once tailings deposition started in the South Cell in November 2014, daily inspections of the downstream toe of Central Dike were undertaken as part of the geotechnical inspection program. A small volume of water located against the downstream toe of Central Dike was noticed at that time. This water was contained between the West road and the Central Dike downstream toe. Agnico utilized piezometers, thermistors and a ground water well to monitor the dike integrity, the foundation temperatures and the piezometric levels within the structure and its foundation. The seepage is located within the mining footprint, away from the receiving environment and is confined directly downstream.

On April 14th, 2015, Agnico started pumping at the D/S toe of the dike to lower the water level. The water was pumped back to the South Cell TSF. Water quality was closely monitored to foresee any changes from initial conditions in terms of turbidity and clarity. A flowmeter was also installed to monitor the volume of water pumped. By July 7th, 2015 pumping was still on going with a larger pump, and continued through 2016, 2017 and 2018.

A series of pumping tests were also performed by Agnico during the summer 2015 to measure the seepage flow according to the head pressure difference between the South Cell and the Central Dike downstream pond (sampling location ST-S-5). In September 2015, mitigation measures were defined with the support of Golder and it was confirmed that the Central Dike could be operated safely under certain conditions. In early November 2015, the downstream pond operational level was to be set at 115masl following Golder's recommendations (Golder, 2015). At the same time, a permanent and winterized pumping system was put in place to manage and track the water volumes through the winter.

In fall 2016 a new electric pumping system was installed to replace the diesel unit previously installed the prior year, mainly to reduce fuel consumption. Pumping has continued until present day and will continue until pit flooding occurs.

In 2018 Central Dike seepage was pumped back into the South Cell. The average seepage rate at Central Dike decreased from 314 m^3/h in January 2018 to 239 m^3/hr in December 2018 and is following the trend from the 2018 seepage modelling done by Golder.

The current mitigation strategy to reduce the risk related to seepage include the following :

- maintain a high surveillance frequency (instrumentation review, site observation)
- presence of a backup pumping unit in the downstream area to maintain enough pumping capacity in case of a sudden seepage increase
- revised tailings & water management strategy to minimise the amount of water stored into the South Cell while maximising tailings coverage against Central Dike and Saddle Dam 4.

- The South Cell water volume can be decreased by pumping it to Bay-Goose Pit as a mitigation strategy

The Central Dike seepage situation is considered under control as Agnico has the pumping capacity to deal with the seepage flow rate, the integrity of the infrastructure has not been compromised, no tailings were found outside the perimeter of the South Cell TSF and the nature of the orange precipitate was identified as a biological iron precipitate.

Daily visual inspections will continue to be completed. The monitoring of the Central Dike seepage will continue throughout the operating life of the dike, with analysis of the instrumentation results and water quality monitoring, as required by the Water License. Constant pumping of the downstream pond to the South Cell TSF will continue until required in order to manage the water and ensure that the seepage water do not reach the receiving environment.

8.5.8.1.3 Seepage and runoff from the landfill

Results and interpretation of this monitoring program are discussed in Section 8.5.3.1.23 above.

8.5.8.1.4 Subsurface seepage and surface runoff from waste rock piles

Sections 8.5.3.1.7 to 8.5.3.1.13 provide details regarding seepage monitoring at the Portage and Vault Rock Storage Facilities.

8.5.8.1.5 Seepage at pit wall and pit wall freeze/thaw and permafrost aggradation

In 2018, some seepage along the faces were noted along the south/west wall of Portage pit E3. Seepage are observed along fracture planes exposed in the bench faces, particularly near the south end of the west wall as this area was originally talik, beneath the previously existing Third Portage Lake. Seepage faces can be expected to contribute to instability of the ultramafic and other rock types during cyclic freeze-thaw.

No mining activities occurred in Portage Pit A and Goose Pit. Therefore, the seepage is contributing to the re-flooding of the pit.

Water inflows and seepage were noted in a number of areas of the Vault pit in 2018. There are three main areas of the pit where water inflow or seepage are noted. These are generally related to the dewatering of Vault Lake, to the current lake level, and to release of water stored in the talik beneath the former lakes.

No major seepage inflows were observed in Phaser and BB Phaser pits.

The “Annual Review of Portage and Goose Pit Slope Performance (2018) - Meadowbank Mine” provides more details regarding seepage at pit walls (Appendix 62).

8.5.8.1.6 Mill Seepage Meadowbank Site

On November 4, 2013, it was observed that water was seeping through the road in front of the Assay Lab Road. In December 2013, Agnico requested Tetra Tech (formerly EBA) to perform an assessment, drilling delineation program and provide a report with recommendations in early 2014. All recommendations made in this report will be completed, prior to closure. Construction of an interception trench was completed in April-May 2014 and repairs and sealing of containment structures within the mill were completed during the summer of 2014. In November 2015 work was conducted to repair portions of the mill floor and ensure its watertight integrity. Additional elastomeric sealant was applied in the floor joints. Agnico also put in place an internal action plan and monitoring program for this seep in 2014. The monitoring is part of the Freshet Action Plan. Refer to Appendix D of the 2018 Water Management Report and Plan (Appendix 8) for more details regarding the monitoring and action taken by Agnico before, during and after the freshet at this seepage area.

The pumping occurs in the warmer months when freshet commences. No flow of water has been pumped during winter months in 2018 in the interception trench and recovery well MW-203 because of frozen conditions. Table 8.98 below presents the volumes of water pumped back to the mill from the seepage from 2014 to 2018. Agnico observed that the flow to the trench increased in 2017 (22,977 m^3) compared to 2016 (11,078 m^3) but is still below 2015 (30,543 m^3) which was required to pump year round, in both the trench and the well. The increase in flow measured in 2017 was likely attributable to increased freshet run offs since no pumping was required in the well or the trench in winter. Volumes pumped in 2018 are similar to those obtained in 2014 and 2015 and may be attributable to a smaller freshet run off.

Table 8.98. Meadowbank Assay Road Seepage pumped volume – 2014-2018

Month	Pumped Volume (m^3)				
	2014	2015	2016	2017	2018
January	0	871	0	0	0
February	0	306	0	0	0
March	0	500	0	0	0
April	0	680	0	0	0
May	2,450	347	0	3,025	0
June	1,935	10,803	2,588	3,973	5,095
July	1,158	6,633	2,270	4,961	4,148
August	3,979	4,467	3,599	3,782	2,912
September	2,420	4,584	2,109	6,687	1,490
October	1,043	1,188	512	549	0
November	842	164	0	0	0
December	871	0	0	0	0
Total	**14,698**	**30,543**	**11,078**	**22,977**	**13,645**

Daily visual inspections were conducted during freshet. Prior and after freshet, inspection were conducted weekly and after rain events.

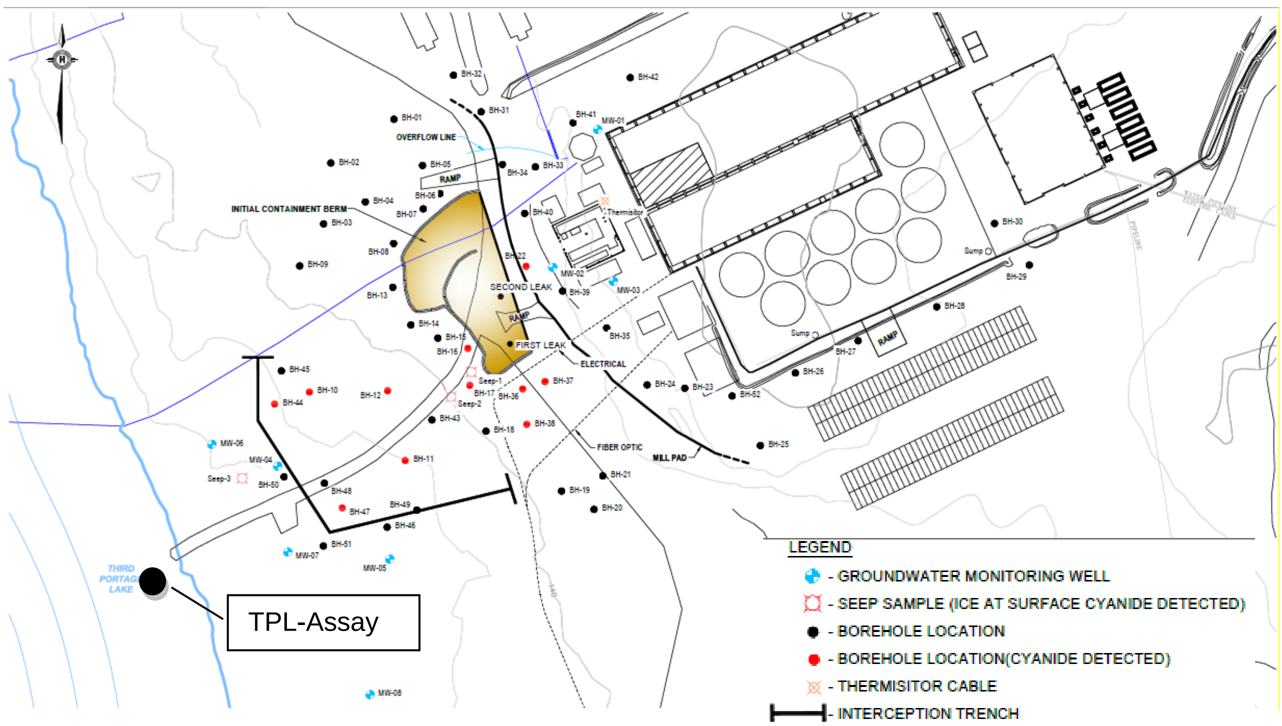
Weekly water samples were collected for CN WAD in the wells and interception trench and analysed at the Meadowbank Assay Lab. In addition, as per the Freshet Action Plan, monthly CN Free, CN total, copper and iron samples were collected when water was present at the interception trench and Third Portage Lake as well as Monitoring Wells MW-04, MW-05, MW-06, MW-07 and MW-08 (presented on Figure 16 below). At KIA's request, additional monitoring was also conducted monthly during open water at TPL. Table 8.99 and 8.100 (Appendix 1) contain monitoring results from the seepage and Third

Portage Lake (TPL-Assay), respectively. It should be noted that wells MW-04 and MW-06 were dry in 2018.

CN Free results in 2018 were all below or near the detection limit of the CCME guideline for the Protection of Aquatic Life. Concentrations of CN total are below regulatory water license and MDMER guidelines. Concentrations of copper are below MDMER and/or water licence guidelines at the trench and monitoring wells but all higher than the CCME guideline. Iron concentrations are higher than the CCME guideline at monitoring well MW-07 but lower in the interception trench. Agnico observed a decrease in concentration of elements 2018 comparatively to previous years. Monitoring will be continued in 2019 as per the Freshet Action Plan to identify if trending is maintained. While concentrations in wells downstream of the trench have decreased since 2015, impacts to the environments have been limited by pumping collected water back to the milling process with no water being discharged to the environment. As well, concentrations at TPL are all below the CCME guideline for the Protection of Aquatic Life for CN Free, copper and iron.

In summary, monitoring in TPL indicates that there has been no impact to the near shore receiving waters. The seepage appears to be effectively contained and the source area has been repaired. Follow up monitoring will continue in 2019 in accordance with the 2019 Freshet Action Plan which includes requests made by KIA in 2014 at the Water Licence renewal hearing.

Figure 16. Meadowbank General Layout of the Assay Road Seepage



8.5.8.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 10*: Summary of quantities and analysis of Seepage and runoff monitoring from the Landfill, Waste Rock Storage Facility and associated dikes/berms*

8.5.8.2.1 Lake water seepage through dewatering dikes

Dewatering had not started in 2018. Therefore no seepage was observed.

8.5.8.2.2 Seepage (of any kind) through Whale Tail Dike

Whale Tail Dike was in construction in 2018 and dewatering was not initiated. Therefore no seepage was observed.

8.5.8.2.3 Seepage and runoff from the landfill

There was no landfill constructed at Whale Tail in 2018, so there is no seepage monitoring to report for this infrastructure.

8.5.8.2.4 Subsurface seepage and surface runoff from waste rock piles

There was no seepage or surface runoff observed from waste rock piles in 2018. The pumping system in place was not used.

8.5.8.2.5 Seepage at pit wall and pit wall freeze/thaw and permafrost aggradation

In 2018 water inflow from Whale Tail Lake into Quarry 1 was observed. This water was managed by pumping it into AP-5. A total of 232,870 m^3 of seepage water was managed this way.

8.6 BLAST MONITORING [*]

8.6.1 Meadowbank Site

As required by NIRB Project Certificate No.004, Condition 85*: develop a detailed blasting program to minimize the effects of blasting on fish and fish habitat, water quality, and wildlife and terrestrial VECs.*

In accordance with NIRB Project Certificate No.004, Condition 85, Agnico Meadowbank Division developed a blasting program which complies with *The Guidelines for the Use of Explosives In or Near Canadian Fisheries Water* (Wright and Hopky, 1998) as modified by the DFO for use in the North and adhere to guidance provided in *Monitoring Explosive-Based Winter Seismic Exploration in Waterbodies* (Cott and Hanna, 2005). As a result, Agnico conducts monitoring to evaluate blast related peak particle velocity and overpressure to protect nearby fish bearing waters.

The results of the 2018 blast monitoring program are available in the report entitled “2018 Blast Monitoring Report for the Protection of Nearby Fish Habitat” prepared by Agnico, attached as Appendix 40.

Peak particle velocity (PPV) and overpressure monitoring data was recorded throughout 2018 during blasting activities at the North Portage Pit, South Portage Pit, Vault Pit, Phaser Pit and BB Phaser Pit. The locations of the blast monitoring stations are illustrated in Figure 1 and Figure 2 of the report Blast monitoring Report found in Appendix 40. The Portage stations are located near the shoreline of Second Portage Lake. The Vault Pit station #2 is located near Wally Lake.

[*] TSM – Biodiversity and Conservation Management

No blast monitoring was conducted at Goose Pit as mining has ceased in this pit since April 2015. Vault Pit station #1, located between the Vault Attenuation Pond (dewatered Vault Lake) and the Vault Pit, was also not monitored since 2016 as the nearest potential fish habitat is in Wally Lake and the Vault Pit station #2 is used to monitored the potential impact. These monitoring stations are also illustrated in Figure 1 and Figure 2 of the report Blast monitoring Report found in Appendix 40.

In 2018, 214 blasts were monitored at Meadowbank. There were no PPV exceedance and IPC measurements were all below the DFO limit of 50 kpa. The average PPV was 0.43mm/s with a maximum of 7.43 mm/s. Table 8.101 present the PPV exceedance from 2013 – 2018 and Table 8.102 contains the maximum and average PPV for 2013-2018 for Meadowbank and Whale Tail.

Table 8.101, Meadowbank and Whale Tail PVV exceedance from 2013-2018

Year	PPV exceedance Meadowbank	PPV exceedance Whale Tail
2013	16	No activities
2014	8	No activities
2015	2	No activities
2016	0	No activities
2017	0	No activities
2018	0	2
Total	**26**	**2**

Table 8.102. Meadowbank and Whale Tail Maximum and average PPV from 2013 - 2018

Location	Parameters	2013	2014	2015	2016	2017	2018
Meadowbank (Portage and Vault, Phaser and BB Pit)	Max PPV (mm/s)	32.7	23.8	16.5	9.54	11.9	7.43
	Average PPV (mm/s)	5.39	3.93	2.38	1.18	0.78	0.43
Whale Tail Pit	Max PPV (mm/s)	No Activities	No Activities	No Activities	No Activities	No Activities	26.1
	Average PPV (mm/s)	No Activities	No Activities	No Activities	No Activities	No Activities	4.18

This decrease in both maximum and average values compared to previous year can be explained by the fact that more blasting occurred in Vault Pit where almost no vibrations are detected by the Instatel blast monitor compared to Portage. Furthermore, both Portage and Vault Pits are deeper and increasing the effective distance between the blast and the Instatel monitoring device.

8.6.2 Whale Tail Site*

As required by DFO Authorization 16HCAA-00370 Condition 2.3.3***: The proponent shall develop a blasting mitigation plan in consultation with DFO to ensure effects on fish and fish habitat are minimized, as per Nunavut Impact Review Board Project Certificate No. 008 Condition 22. The Blasting mitigations plan shall be submitted to DFO prior to construction for approval, and shall adhere to the guidance provided in the Monitoring Explosive-Based Winter Seismic Exploration in Waterbodies, NWT 2000-2002***

And

As required by NIRB Project Certificate No.008 Condition 22: ***The Proponent shall engage with Fisheries and Oceans Canada to develop project specific thresholds, mitigation and monitoring for any blasting activities that would exceed the requirements of Fisheries and Oceans Canada's Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters. If project-specific thresholds, mitigation and monitoring requirements are developed, the Proponent shall identify these requirements in the annual report provided to the NIRB.***

In accordance with NIRB Project Certificate No.008, Condition 22 and DFO 16HCAA-00370 Condition 2.3.3, Agnico had developed a blasting program which complies with *The Guidelines for the Use of Explosives In or Near Canadian Fisheries Water* (Wright and Hopky, 1998) as modified by the DFO for use in the North and adhere to guidance provided in *Monitoring Explosive-Based Winter Seismic Exploration in Waterbodies* (Cott and Hanna, 2005). As a result, Agnico conducts monitoring to evaluate blast related peak particle velocity and overpressure to protect nearby fish bearing waters.

Agnico have update the Blast Monitoring Program (Version 3, March 2019), previously approved for Meadowbank mine, to include the monitoring of Whale Tail site. This version is submitted as part of the 2018 Annual Report. Agnico also submitted in 2018 a specific blast memo to DFO regarding Whale Tail Dike Construction.

The results of the 2018 blast monitoring program are available in the report entitled "2018 Blast Monitoring Report for the Protection of Nearby Fish Habitat" prepared by Agnico, attached as Appendix 40.

Peak particle velocity (PPV) and overpressure monitoring data was recorded throughout 2018 during blasting activities at the Whale Tail Site Quarry 1, Whale Tail Site Quarry 2 and Whale Tail Pit. The locations of the blast monitoring stations are illustrated in Figure 1 and Figure 2 of the report Blast monitoring Report found in Appendix 40.

In 2018, 45 blasts were monitored at Whale Tail. There were two (2) PPV concentrations exceeded the DFO limit of 13 mm/s. IPC measurements were all below the DFO limit of 50 kpa. The average PPV was 4.18 mm/s with a maximum of 26.1 mm/s. Table 8.101 and 8.102 above will be updated annually.

* TSM – Biodiversity and Conservation Management

The two exceedances were recorded in 2018 and occurred during period of egg incubation (egg incubation period is from August 15 to June 30). These two events were located at Whale Tail:

- The first exceedance was recorded at Whale Tail Station #1 for the 5144PSA52_SEQ1 with 16.8 mm/s on March 22nd. For this blast, nine (9) preshear holes were detonated on the same delay, which isn't significantly higher than what was previously done at Whale Tail and Meadowbank for 14 m holes. To mitigate the probability of another exceedance for preshear holes, mitigation technique number four from the Blast Monitoring Plan was used. This technique is to reduce the explosives quantity per delay. Since this event, no exceedances were observed for preshear holes.

- The second exceedance was recorded at Whale Tail Station #1 at 26.1 mm/s for pattern 5144A55 blasted on April 30th. This blast was for Attenuation Pond 5 were previous blasts were not yielding enough movement, in order to remediate this, delay between rows were shortened from 176 ms to 66 ms. Shortening the delay between rows increased our PPV over the limit, Therefore, in order to reduce the PPV and reduce the probability of exceeding the 13mm/s maximum, delay between rows were brought back to 176 ms.

Additionally, two exceedances were recorded on the quarry located on KM10 of the Whale Tail Haul Road (1000QY100-1-3). However, after investigation, the instrument was not properly installed and was placed next to the blast and not next to the closest fish bearing waterbody for both of the events. Going forward, it will be imperative to develop a proper blast monitoring plan for every blasting activity outside of the areas covered in the current blast monitoring plan (for Portage, Vault and Whale Tail Pit).

8.7 GROUNDWATER MONITORING

8.7.1 Meadowbank Site

As required by NIRB Project Certificate No.004 Condition 8: ***Continue to undertake semi-annual groundwater samples and re-evaluate the groundwater quality after each sample collection; report the results of each re-evaluation to NIRB's Monitoring Officer, INAC and EC.***

The full results of the 2018 groundwater monitoring program are available in Appendix A, 2018 Groundwater Monitoring prepared by SNC, of the Groundwater Monitoring Plan found in Appendix 37. Appendix B of the Groundwater Monitoring Plan presents historical analytical and trends results from 2003 to 2018.

The 2018 groundwater monitoring program at Meadowbank was conducted in accordance with the Groundwater Monitoring Plan. The objective of this program is to document any effects of mining on groundwater quality, particularly with respect to tailings deposition. This is done by monitoring the salinity of shallow and deep groundwater. The recorded data is also used to update water quality predictions at the site.

Four new monitoring wells were installed in 2018 from May 29th to June 4th, 2018 following technical advice and field services from an experts firm in the field of hydrogeology and geochemistry to improve the data collected for water quality model updates. The new monitoring wells were implemented considering the current state of knowledge and the monitoring wells were installed in talik.

The 2018 groundwater monitoring program included the following eleven (11) monitoring stations:

- five (5) groundwater observation wells (MW-IPD-01 (s), MW-IPD-01 (d), MW-IPD-07, MW-IPD-09 and MW-16-01)
- three (3) dike seepages;
- one (1) pit sump;
- one (1) Storm management pond sump; and
- one (1) reclaim water.

Two groundwater sampling programs from July 5th to July 12th, 2018 and September 6th to September 13th, 2018 using low-flow sampling techniques for licensing requirements with duplicate, field blanks, and transport blanks were completed in 2018.

From 2003 to 2016, fourteen (14) monitoring wells were installed at Meadowbank mine. No groundwater well was installed in 2017. In 2018, only one (1) well (MW-16-01) from previous well installations remains operable. Formation of thick ice bridges challenged the sampling of well MW-08-02 again this year. Therefore, this well was not sampled in 2018.

Concentrations of all parameters measured in groundwater related samples in 2018 are provided in Appendix A, 2018 Groundwater Monitoring prepared by SNC, of the Groundwater Monitoring Plan found in Appendix 37. Agnico will refer the reader to this appendix for a complete interpretation of the data.

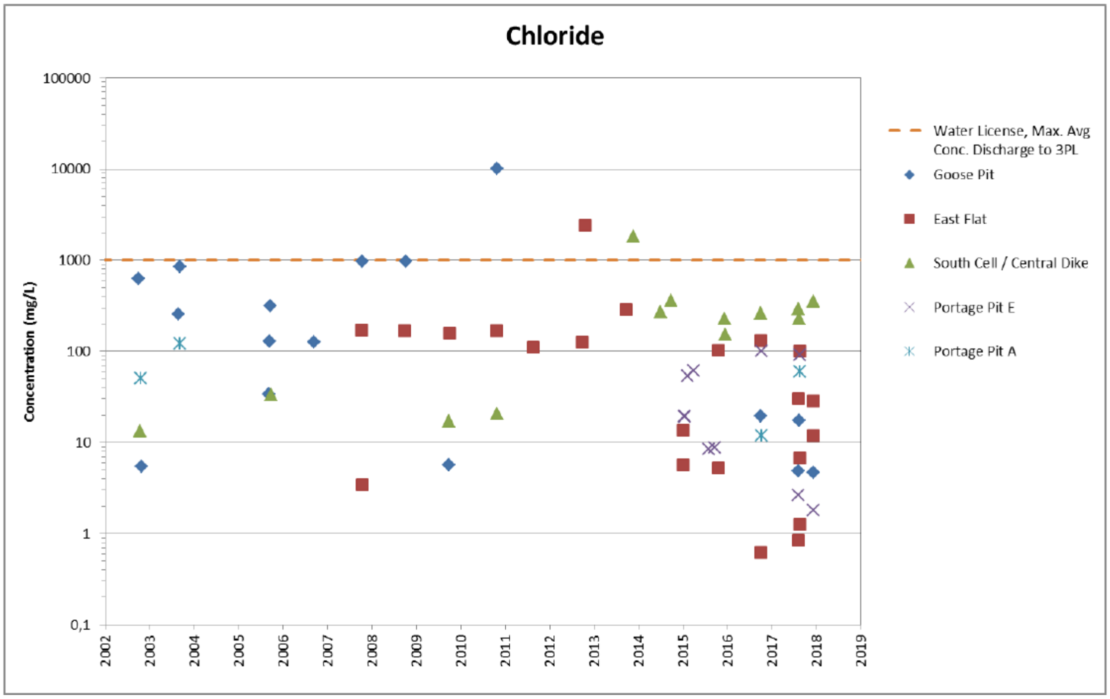
Groundwater collected in 2018 from the four (4) newly installed well fits within the natural groundwater category established on 2017 results and can be use as threshold values to monitor groundwater quality in the future.

Each groundwater sample has a distinctive signature defined by its dissolved concentrations of chemical constituents. The interpretation of groundwater chemistry data contributes to improve the understanding of groundwater flow, contaminants migration and transformation processes along pathways as water composition varies. It can also help to identify zones where surface water and groundwater interact and define if the interaction is continuous or is only during permafrost thawing.

Water analytical results were compared to the criteria listed in Agnico Groundwater Reports 2016 to 2018. Parameters exceed the criteria when they are three times the concentrations of Third Portage Lake (TPL) fresh water. Analytical results are found in Appendix I of the 2018 Groundwater Monitoring Report (Appendix 37) and concentrations exceeding these criteria are highlighted in bold format. Table 3-3 (Appendix 37) also shows the sampling stations and parameters that are exceeding criteria. To avoid confusion in the data interpretation, Agnico will refer the reader to the 2018 Groundwater Monitoring Report. Figure 17 to 19 below show the historical water quality results for chloride, copper and sulphate.

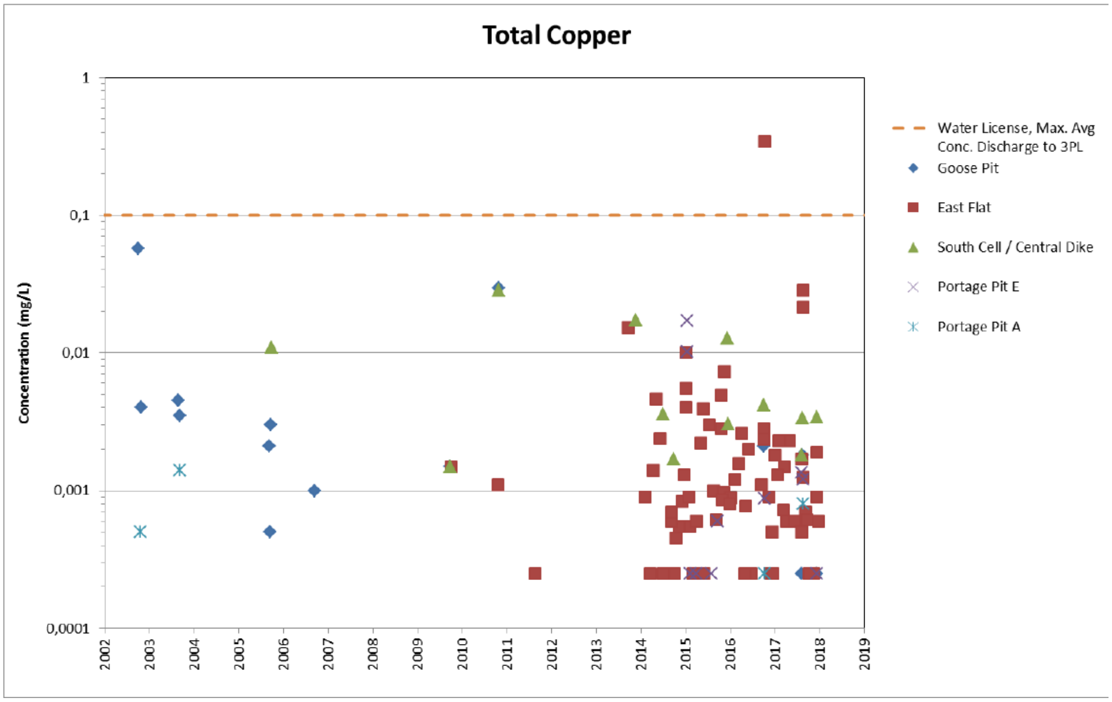
High chloride concentrations were found in several monitoring wells before 2014, especially in the Goose Pit area. The cause of these elevated level of chloride could related to the used of de-icing salt and calcium chloride brine solution used to prevent the boreholes of the monitoring well from freezing after drilling operation and remains present in the groundwater for years despite intensive purging of the wells after installation. Chloride concentrations at South Cell and Central Dike area show higher values than the other monitoring wells and could be directly related to the reclaim water stored in the South Cell Tailings Storage Facility (TSF).

Figure 17. Meadowbank Groundwater quality results chloride



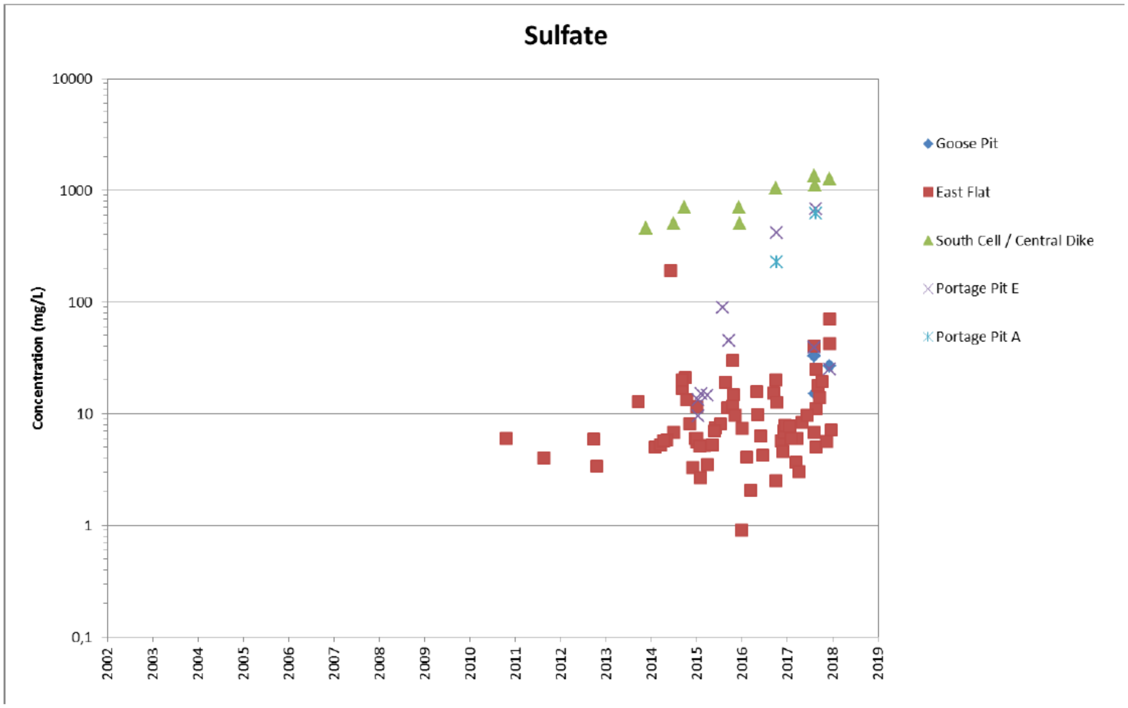
Total copper concentrations in most areas seems to decrease with time, which could be caused by adsorption of copper onto the surrounding rock body and/or its precipitation.

Figure 18. Meadowbank Groundwater quality results copper



Sulfate concentrations seem to be trending upward since 2014 at South Cell and Central Dike area. The presence of sulfate could be directly related to the reclaim water stored in the South Cell TSF. East flat area shows lower sulfate concentrations generally between 2 and 300 mg/L, without clear trend. At Portage Pit E, higher sulfate concentrations were found during the latest sampling campaigns, mainly from sampling locations located closer to the reclaim water stored in the South Cell TSF.

Figure 19. Meadowbank Groundwater quality results sulphate



The next phase for 2019 is to prepare a groundwater program that will ensure groundwater flow comprehension and groundwater sample integrity as well as a successful 2019 sampling campaign.

8.7.2 Whale Tail Site

As required by NIRB Project Certificate No.008 Condition 15: ***The required Groundwater Monitoring Plan should be submitted to the NIRB at least 30 days prior to the start of construction, with subsequent plan revisions or updates submitted annually thereafter. Subject to the additional direction and requirements of the Nunavut Water Board, the Proponent shall prepare and implement a Groundwater Monitoring Plan that, at a minimum includes:***

- ***The collection of additional site-specific hydraulic data (e.g., from new monitoring wells) in key areas during the pre-development, construction and operation phases;***
- ***Definition of vertical and horizontal groundwater flows in the project development areas;***
- ***Delineates monitoring plans for both vertical and horizontal ground water; and***
- ***Thresholds that will trigger the implementation of adaptive management strategies that reflect site specific conditions encountered at the project site.***

And

As required by NIRB Project Certificate No.008 Condition 16: ***An updated Groundwater Monitoring Plan that outlines the Proponent's plans to fulfill this term and condition should be submitted to the NIRB at least 30 days prior to the start of construction, with subsequent plan revisions or updates submitted annually thereafter. Within two years of commencing operations, the Proponent shall:***

> ***a) Conduct additional analyses to determine the approximate fill time for the Whale Tail Pit at closure;***
>
> ***b) Undertake a hydrogeological characterization study to assess the potential for arsenic and phosphorous diffusion from submerged Whale Tail pit walls;***
>
> ***c) If the results of the characterization study indicate a moderate to high potential for arsenic and/or phosphorous diffusion, perform detailed hydrodynamic modelling of the flooded pit lake prior to closure to evaluate meromictic conditions and flooded pit water quality; and***
>
> ***d) Add these required activities to the site Groundwater Monitoring Plan.***

On February 20, 2019, Agnico has submitted to NWB the Groundwater Monitoring Plan Version 2.1 (February 2019) to address concerns raised by CIRNAC. On March 4th, 2019, CIRNAC confirmed by email to Agnico that the new information provided in Version 2.1 met the overall objective of Term and Condition no. 15. This plan is still under NWB approval. Agnico will refer the reader to the plan in Appendix 51 for a completed review of the proposed monitoring and data interpretation.

To comply with Condition 16 of NIRB Project Certificate, Agnico has presented on June 2018 the Whale Tail Pit Project Hydrodynamic Modelling of Whale Tail Pit Lake. The results and interpretation of the results can be found in Appendix 41.

In Appendix 38, the 2018 Groundwater Management Monitoring Report presented a compilation of the site-specific data collection in 2018 and the review of 2018 monitoring data undertaken by Agnico to meet the requirements established in the Groundwater Monitoring Plan (approved version 1). The following is a summary of the report and Agnico will refer the reader to the whole report in Appendix 38 for an exhaustive comprehension of the program and results for 2018.

The following presents a summary of the data contained in this document and reference to the relevant sections of the GWMP.

- The Westbay multi-level well was re-sampled in 2018 (section 2.3.1 of the GWMP). Although the calculated TDS concentrations were higher than when the well was sampled in 2016, they are not considered to represent an increase in formation groundwater TDS because the TDS profile in the hydrogeological models were based on the more reliable and applicable 2016 data.

- Hydrogeological testing (section 2.3.2 of the GWMP) was undertaken in the deep bedrock and the hydraulic conductivity values estimated from the tests were less than 1 x 10-10 m/s. This data indicates that the deep sub-permafrost bedrock hydraulic conductivity adopted in the FEIS was conservatively high for the prediction of long-term post closure recharge/discharge from the pit lake.

- To define horizontal and vertical groundwater flow (section 3.1 of the GWMP) thermistor, lake water levels and Westbay hydraulic head measurements were used. Thermistor data confirmed that horizontal groundwater flow below the active layer is restricted by permafrost in at least the upper 425 m. Horizontal groundwater flow in the sub-permafrost is therefore controlled by the relative hydraulic heads of lakes that are sufficiently large and deep to have an open talik beneath them. Hydraulic head measurements in the Westbay multi-level well indicated a downward vertical hydraulic gradient of 0.008 m/m that is consistent with the estimated hydraulic gradient derived form the relative difference in the hydraulic head at Whale Tail Lake and DS1 divided by the distances between these lakes (including the distance down through the open talik beneath Whale Tail lake and up through the open talik of DSI).

- Inflow to Quarries that were excavated on land for material for site infrastructure was found to be essentially surface water. Groundwater inflows to the pit sumps is not expected to occur until lake dewatering is undertaken in 2019. In the absence of groundwater inflow, comparison of observed groundwater inflow to the Whale Tail Pit to the predicted inflows (section 3.3 of the GWMP) could not be undertaken in 2018.

8.8 HABITAT COMPENSATION MONITORING PROGRAM

8.8.1 Meadowbank Site

As required by DFO Authorizations NU-03-0191.3 Condition 3 and 6 (Second and Third Portage Lakes), NU-03-0191.4 (Vault Lake) Condition 3 and 6; NU-03-0190 Condition 5 (AWPAR), NU-14-1046 (Phaser Lake) Condition 3 and 5; *Submit written report summarizing monitoring results and photographic record of works and undertakings.*

And

As required by NIRB Project Certificate No 004 Condition 53: *Agnico Eagle Mines Ltd. shall, in consultation with the HTOs and DFO, develop a Fish Habitat Monitoring Plan, including augmenting baseline fisheries data in the period prior to operation, with the clear objective of demonstrating the success of the No Net Loss Plan approved by the DFO. The Fish Habitat Monitoring Plan should include Phaser Lake. The updated plan should be provided to the NIRB for review at least 30 days prior to commencement of construction activities. Results from the fisheries baseline data to be provided in the annual report to the NIRB*

According to Fisheries and Oceans Canada (DFO) Authorizations NU-03-0191.2, NU-03-0191.3, NU-03-0191.4 and 14-HCAA-01046, Agnico Eagle maintains a Habitat Compensation Monitoring Plan (HCMP; Version 4, 2017) to ensure that fish habitat compensation features at the Meadowbank site are constructed and functioning as intended. Based on the schedule described in the HCMP, monitoring of compensation features generally occurs every 2 years. Monitoring was conducted in 2017 for the constructed spawning pad, located at stream crossing R02 along the all-weather access road (AWAR) to Baker Lake, as well as for several onsite habitat compensation features (East Dike, Bay-Goose Dike, Dogleg Ponds). As described in the HCMP, the AWAR study included a visual assessment of stability, as well biological monitoring to confirm use by Arctic grayling. The onsite monitoring included an assessment of interstitial water quality, periphyton growth, and fish use. Complete details can be found in the 2017 HCMP report found at Appendix G5 of the 2017 Annual Report. The next monitoring is planned for the summer of 2019.

8.8.2 Whale Tail Site

8.8.2.1 Fish Habitat Offsetting Plan

As required by NIRB Project Certificate No.008 Condition 24: ***The Proponent shall engage Fisheries and Oceans Canada, and other interested parties to further assess:***

- ***Whether the increased surface area of Whale Tail Lake is a viable offset to habitat losses resulting from development of the Project; and***
- ***Whether Whale Tail end pit would support fish in the post closure scenario.***

Results of this assessment should be incorporated into the Habitat Compensation Plan and/or the Conceptual Fisheries Offsetting Plan as appropriate. The updated information should be submitted to the NIRB at within 60 days of the issuance of the Project Certificate

And

As required by DFO Authorization 16HCAA-00370 Condition 5.2.1: ***The Proponent shall monitor to validate Agnico Eagle Mines Ltd.'s Habitat Suitability Index (HSI). The monitoring shall be conducted to the satisfaction of DFO. Where appropriate, the HSI will incorporate additional knowledge generated by the complementary measures research projects under section 4.2.2, in particular research project 4.2.2.1c, and adjust the Habitat Evaluation Procedure (HEP) model according to the results generated. The HSI will be use to refine, as necessary, the performance end-points in habitat units for offsetting***

Agnico has submitted the Fish Habitat Offsetting Plan (Appendix 51) on March 2018. Changes to fish habitat between baseline conditions and predicted conditions during the operations and post-closure scenarios are compared in this plan and will be updated as required.

8.8.2.2 Fish Habitat Offset Monitoring Plan

As required by DFO Authorization 16HCAA-00370 Condition 5.1.1.2: ***The proponent shall provided an updated Whale Tail Pit Fish Habitat Offset Monitoring Plan, prepared by Agnico Eagle Mines Ltd. To DFO for review and approval on or before December 31, 2018. This update shall include, but is not limited to, details on the monitoring methods, frequency of monitoring, sampling location and criteria for success.***

And

As required by DFO Authorization 16HCAA-00370 Condition 5.1.1.3: ***The proponent shall develop a schedule for the implementation of the offsetting measures, and shall provide this schedule to DFO no later than December 31, 2019***

And

As required by DFO Authorization 16HCAA-00370 Condition 5.1.1.4: ***The Proponent shall provide an annual Whale Tail Pit Fish Habitat Offset monitoring Report to DFO (and interested parties) following the construction of the offsetting habitat by March 31. The Proponent is required to provide the Whale Tail Pit Fish Habitat Monitoring Report until DFO indicates this requirement has been met***

And

As required by DFO Authorization 16HCAA-00370 Condition 5.1.1.5: ***As part of the annual Whale Tail fish Habitat Offset Monitoring Report, the Proponent shall include, but not limited to:***

- ***a digital photographic record with GPS coordinates of pre-construction, during construction and post construction conditions shall be compiled using the same vantage points and direction to show that the approved works have been completed in accordance with the offsetting plan***
- ***-a summary of field observations for each respective year as well as as-built survey***
- ***-a detailed analysis report summarizing the effectiveness of the offsetting measures***

Agnico submitted the Version 1 of the Whale Tail Fish Habitat Offset Monitoring Plan on March 2018 (Appendix 51).

Agnico did not update of the monitoring plan in fulfillment of the Condition 5.1.2 as Agnico is waiting to receive DFO's comments on Version 1, if any before proceeding. The plan Version 1 was resubmitted to DFO on March 15, 2019.

No offsetting measures were implemented in 2018. The schedule is to be submitted to DFO on December 31, 2019. Therefore, no Fish Habitat Offset Monitoring Report were completed for 2018. Section 8.8.2.4 detailed the complementary measures research.

8.8.2.3 Consultation

As required by DFO Authorization 16HCAA-00370 Condition 5.1.1.6: ***Each year, following the submission of the annual Whale Tail Pit Fish Habitat Offset Monitoring Report to DFO, the Proponent shall arrange to meet with DFO and interested parties (e.g., KIA) to review the results of the previous year of the monitoring program. The results of the meetings and any mutually agreed upon modifications aimed at improving the effectiveness of the offsetting monitoring program shall be incorporated into the upcoming year of the monitoring programs. The Proponent shall update the Whale Tail Pit Fish Habitat Offset Monitoring Plan, to reflect the changes, and the plans shall be approved in writing by DFO prior to implementation***

This will be implemented following the first reporting year.

8.8.2.4 Complementary measures research - Fish Habitat Offsetting Plan Whale Tail Pit

As required by DFO Authorization 16HCAA-00370 Condition 4.2.1.2: ***The Proponent shall provide updated research plans with detailed methodologies for projects listed under conditions 4.2.2.1a, b, c and d. Each updated plan shall be provided to DFO for approval on or before December 31, 2018 and at least 60 days prior to commencement of research.***

And

As required by DFO Authorization 16HCAA-00370 Condition 4.2.1.6: ***The proponent shall make all effort to ensure that the results from the research projects conducted for the complementary measures are published in peer-reviewed scientific journals***

8.8.2.4.1 Assessment of changes in aquatic productivity and fish populations due to flooding of Whale Tail South and downstream, lakes during operations

In 2018, a Research Agreement was signed between University of Waterloo researchers and Agnico Eagle for the complementary measures project "Investigating Changes in Productivity Following Flooding of Barrenland Lakes", as described in Section 2.1, Appendix C of the Whale Tail Pit Fish Habitat Offsetting Plan (May, 2018) and approved by DFO according to Fisheries Act Authorization 16HCAA-00370. The Research Plan for this project as described in the Research Agreement is provided below.

8.8.2.4.1.1 <u>Summary</u>

Relatively little information is available in the literature to support development of productivity models for Arctic lakes. This information is integral to environmental impact assessments, and understanding drivers of fish population productivity will help inform future directions of habitat evaluation procedure (HEP) methods. This study will assess whether water quality variables directly associated with lower-trophic productivity (e.g., nutrients) change following mine-related flooding in a series of Arctic lakes and ponds, and whether indicators of health and mercury concentrations in small-bodied fish are impacted as a result.

8.8.2.4.1.2 <u>Background</u>

Changes in water quality often affect lower tropic-level communities and productivity of fisheries. Numerous studies (commonly referred to as "fertilization" studies or experiments) have documented changes in biotic community structure in sub-Arctic and northern temperate lakes in response to nutrient additions (Clarke et al. 1997; Hershey 1992; Johnston et al. 1999; Jorgenson et al. 1992; Smith 1969; Welch et al. 1988). Studies have shown that nutrients, in particular total phosphorus, can control the rate of fish production in lakes (Colby et al. 1972; Plante and Downing 1993), although in some cases fish growth is affected whereas density of fish is not (e.g., Lienesch et al. 2005). Flooding can result in nutrient releases from terrestrial to aquatic systems (Grimard and Jones 1982; Hecky et al. 1984; Ostrofsky and Duthie 1980; Paterson et al. 1997), although to date most studies have been conducted in temperate systems. There is great uncertainty about the effects of flooded tundra habitat on primary productivity and/or on productivity of fisheries in Arctic systems.

As well as affecting productivity, flooding can affect mercury concentrations in aquatic systems. This may occur through indirect or direct pathways. Nutrients and dissolved organic carbon released from flooded tundra may affect transport to, and speciation of, mercury in downstream aquatic ecosystems (e.g., St. Louis et al. 2004), and result in relatively higher concentrations of mercury in fish (e.g., Willacker et al. 2016). Further, it has recently been shown that permafrost is a globally dominant sink for mercury (Schuster et al. 2018). Thawing permafrost, through flooding, may result in releases of mercury to the downstream system, but the effects of flooding on mercury concentrations in fish in this system are difficult to estimate. The flooding of Arctic lakes in the Meadowbank region provides a unique opportunity to compare water chemistry and mercury concentrations before and after flooding.

8.8.2.4.1.3 <u>Objectives</u>

Specifically, this research study will aim to understand whether changes in lower-trophic productivity (e.g., nutrients) following mine-related flooding result in changes in fish trophic ecology and condition, as well as changes in concentrations of mercury and methyl mercury in the system.

Since flooding activities are planned to occur over a relatively short term (2-3 years), the study will specifically include a focus on small-bodied fish, which are expected to react first to changes in water quality. Changes in primary productivity, as well as growth, condition, and mercury concentrations in small-bodied fish will be related to water quality variables and changes in lake morphometry (especially area). Use of newly flooded habitats by small-bodied fish will also be assessed and related to habitat characteristics using presence-only surveys.

8.8.2.4.1.4 __Methods__

The following specific methods related to surveillance and analysis of fish populations are planned to be included as part of this study:

- Shoreline electrofishing and/or visual surveys, both before and after flooding. Key variable investigated: catch per unit effort (electrofishing seconds);
- Collection of small-bodied fishes for analysis of trophic ecology and growth parameters, both before and after flooding. Key variables investigated: sources of carbon (pelagic or benthic), trophic position, growth rates, condition; and
- Presence-only surveys, after flooding. Key variable investigated: fish presence in newly flooded habitats, and relationships with habitat covariates.

Assessments of changes in fish populations will take into account relationships with the following water quality parameters, some of which are planned to be collected through compliance monitoring programs, and some of which are supplementary:

- Quantity and quality of dissolved organic carbon (compliance and supplementary);
- Total and dissolved concentrations of nitrogen (compliance);
- Total and dissolved concentrations of phosphorus (compliance);
- TSS (compliance);
- Chlorophyll-a (compliance);
- Major anions and cations (compliance);
- Total and dissolved metals (compliance);
- Stable isotope ratios on dissolved inorganic carbon (supplementary); and
- Total and methyl mercury analyses (compliance and supplementary).

Some or all of the above assessments will be conducted in the following lakes: Whale Tail Lake (A17), A63, A65, A20, Mammoth Lake (A16), A76, and additional reference systems (to be identified during the 2019 field season).

8.8.2.4.1.5 Timeline

Field activities for this study began in Summer 2018 due to tight timelines related to dike construction and flooding of Whale Tail – South Basin. Based on current mine plans and offsetting measures, this study will occur over a 4-year time period. Assessments of fish population metrics will take place annually over at least three study years during two-week (approximate) field visits in the summer (June-August).

8.8.2.4.1.6 Project Deliverables

By no later than February 1 of each year during the term of the Agreement, the University will provide a brief report and summary of the data collected to the Client and thereafter to the Meadowbank Fisheries Research Advisory Group (MFRAG). The report will outline collection activities, preliminary results, and proposed future activities, and include the notice of intent to publish or present, as applicable.

Communication of study results to the scientific community will be provided through development of one or more peer-reviewed manuscripts. Publication of one or more manuscripts in peer-reviewed journals (e.g. Canadian Journal of Fisheries and Aquatic Sciences, Environmental Toxicology and Chemistry, Arctic Science, Arctic) will be targeted, as will presentation of results by the research team during at least one national conference (e.g. Canadian Conference for Fisheries Research). The development and publication will assist proponents and regulators in future assessments of potential new project impacts.

The research team will also aim to present study results at the Canadian Conference for Fisheries Research.

8.8.2.4.2 Assessment of impacts of the Baker Lake wastewater outflow on nutrient status/fish productivity and fish habitat

In February, 2019, NSERC approved funding of the Collaborative Research and Development grant application submitted by Agnico Eagle and Dalhousie University, entitled "Validating Environmental and Human Health Improvements Associated with Wastewater Treatment Upgrades in Arctic Communities". As described in Section 2.2, Appendix C of the Whale Tail Pit Fish Habitat Offsetting Plan (May, 2018) and approved by DFO according to Fisheries Act Authorization 16HCAA-00370, research objectives for this project related to fish health, habitat and productivity will provide complementary offsets for the Whale Tail Pit project. The research objectives related to fish habitat and health as described in the NSERC application are provided below. A detailed research plan will be developed and presented to DFO prior to study initiation in 2019.

8.8.2.4.2.1 Research Objectives

Changes in the ecological health of key receiving water bodies (Finger Lake, Airplane Lake, Baker Lake) will be assessed using both biological and chemical approaches. Concentrations of CECs (e.g., pharmaceuticals and personal care products, and polyfluoro-compounds), metals, and microplastics in water and sediment will be measured in these water bodies before (2019) and after (2021, 2020) the wastewater system upgrade. Changes in trophic state of these water bodies will also be assessed using measurements of nutrients (N and P), chlorophyll a, secchi depth, dissolved organic carbon, and dissolved oxygen. For inorganic and organic contaminants known to be at elevated concentrations in effluents from both wastewater and landfill sources, relationships between levels in effluents, receiving waters, sediments, food sources (e.g., benthic invertebrates), and fish tissue (muscle, liver) will be characterized. Concentrations of metals will be determined by inductively coupled plasma optical emission spectrometry (ICP-OES) and inductively coupled plasma mass spectrometry (ICP-MS) at University of Waterloo. A PhD student (PhD 3-1) will use results to: a) determine if wastewater exposures can be discerned from landfill exposures and from background (reference systems will also be sampled); b) compare exposures to relevant water quality guidelines; c) characterize routes of exposure for trace metals into fish; and, d) assess changes in trace metal exposures to fish pre- and post-upgrade.

Fish health is of paramount interest to northerners, and is affected by a complex array of physical and biological factors, including concentrations of contaminants and productivity of the system. Standard methods of assessing fish health at industrially developed sites have been developed by Environment Canada, as part of the national Environmental Effects Monitoring (EEM) program (Environment Canada 2012). PhD 3-2 will assess tissue-level indicators of exposure to contaminants, including gonadosomatic index and liver-somatic index, in one small-bodied and one-large bodied fish species in both exposed and reference systems, pre- and post-upgrade. These analyses will be complemented by assessments of fish growth and condition; because many Arctic lakes are characterized by low primary productivity, fishes are often energy-limited.

8.8.2.4.3 Literature review and field validation of northern lake fish habitat preferences

In August, 2018, a Research Agreement was signed between DFO and Agnico Eagle for the complementary measures project "Lake Fish Habitat Preferences", as described in Section 2.3.1, Appendix C of the Whale Tail Pit Fish Habitat Offsetting Plan (May, 2018) and approved by DFO according to Fisheries Act Authorization 16HCAA-00370. The Research Plan for this project as described in the Research Agreement is provided below.

8.8.2.4.3.1 Part 1 – Literature and Data Review

A research document will be produced reviewing literature and unpublished data about fish associations with habitat in Northern lakes and rivers. Partially using systematic guidelines (CEE 2018), a graduate student employed by DFO is reviewing literature and canvasing for unpublished data (e.g. DFO Path Database, DFO FishOut Database) for up to 50 northern fish species with lake and rivers distributions in Nunavut and the Northwest Territories. Information from the report will be used to update base tables in the HEAT Tool for Fisheries Protection Program (FPP) decision makers use. Habitat associates and environmental tolerances of interest for northern species include depth distributions, tundra/taiga vegetation and substrate-type associates, temperature cues and preference water clarity/suspended sediment tolerances, dissolved oxygen associations/tolerances, connectivity needs, and possibly contaminant and pH effects. Life-stage specific information will be gathered for the four stages identified in HEAT tables for the North: egg (spawning), YOY (nursery), juvenile, and adult life stages.

8.8.2.4.3.2 Part 2 – Field Sampling and Processing

Year 1 (2018): DFO staff will work with Agnico Eagle and consultants to reconnoiter all lakes in the vicinity of the Whale Tail and Meadowbank mine sites and to sample up to four lakes in the summer of 2018 over a ten day period to test sampling techniques. Lakes will include two future impacted sites and two undisturbed lakes. Techniques that will be tested for northern applicability will include those to sample fish: split beam acoustics (SimRad EK60 120 KHz), trap nets or minnow traps in shallow areas, gill nets in deeper sites and camera-mount or video capture compared to eDNA results if available (see Section 8.9.6). Habitat sampling methods will include bottom acoustics, sediment grabs or images, longterm logger deployments, and multi-probe towed sonde surveys. Focusing on data gap filling and avoid lakes if data is already available from partners. Protocols for sampling fish and habitat will be shared with FPP and others for use in continued baseline, functional and effectiveness monitoring.

Year 2 (2019): A subset of habitat and fish sampling techniques selected based on Year 1 results will be applied to carry out fish habitat association sampling in at least two of both undisturbed and impacted lakes. The sampling will be carried out over a longer period reflecting summer conditions. Remote sensing, tagging and logging techniques to evaluate conditions during other seasons might be used if found feasible in Year 1.

Statistical spatial analyses of habitat sampling and fish occurrence/distribution data will be used to establish habitat associations and niche occupancy. These field results and analyses will be the basis of a research document to complete habitat association gaps. The findings of years 1 and 2 will be used to evaluate preferred methods and to recommend standard fish habitat and population sampling techniques.

8.8.2.4.3.3 __Deliverables__

1) A research document about literature and data review of fish species and their habitat associations at northern latitudes to complement reviews completed in 2002 or earlier.

2) A research document about field measurements of northern fish species and their habitat associations in the Kivalliq area of Nunavut. This research document will include preliminary summer species-habitat associations based on field sampling using an impact-reference condition design. This document will include recommendations about standardised methods based on assessment of various habitat and fish sampling methods for different habitat types in northern lakes.

8.8.2.4.4 Arctic Grayling Occupancy Modelling

In 2018, a Research Agreement was signed between University of Waterloo researchers and Agnico Eagle for the complementary measures project “Modelling of Arctic Grayling Occupancy”, as described in Section 2.3.2, Appendix C of the Whale Tail Pit Fish Habitat Offsetting Plan (May, 2018) and approved by DFO according to Fisheries Act Authorization 16HCAA-00370. The Research Plan for this project as described in the Research Agreement is provided below.

8.8.2.4.4.1 __Summary__

The objective of this work is to develop occupancy models for Arctic grayling in the region of Agnico Eagle’s Meadowbank mine. Results will include a list of variables that best predict Grayling presence/absence, and recommendations for future monitoring and habitat enhancements.

8.8.2.4.4.2 __Introduction__

Fisheries and Oceans Canada (DFO) has approved complimentary measures in the form of fisheries-related research as part of an offsetting package for Agnico Eagle’s Whale Tail Pit Project. One of the research activities is the development and validation of occupancy models for Arctic Grayling in the region, with results compared to those generated for different ecoregions in the Northwest Territories (Baker et al. 2017; Lewis 2018). Understanding how fish occupy fluvial systems in response to measurable habitat characteristics will facilitate and improve the accuracy of environmental impact assessments, monitoring plans, and habitat offset plans. This document provides an introduction to occupancy modeling, and outlines specific objectives, methods, timelines, and deliverables for the project.

*8.8.2.4.4.3 **Background***

To effectively evaluate habitat offsetting measures, robust and accurate data are required on fish populations both before and after habitat enhancements have taken place. Obtaining these data in northern, remote environments is difficult and expensive. As a result, there is often a great deal of uncertainty around the findings.

All methods of fisheries monitoring have advantages and disadvantages, but obtaining robust and reliable data on fish abundance from standard techniques (such as three-pass depletion surveys) is especially problematic in the Arctic, where studies are expensive, logistics (and thus, often timing of surveys) are constantly changing, and backpack or big boat electrofishing (standard in many abundance three-pass depletion surveys) requires trained and certified operators and specialized equipment (which has to be shipped up from the south). In addition, to meet the required intensity of sampling required for abundance estimates, the spatial scale of abundance surveys is often small.

Occupancy surveys and occupancy models are a relatively new (~15 years) approach for monitoring animals. Instead of focusing on the number of animals, occupancy models focus on presence/absence. For each study, the spatial scale is carefully considered and adapted to reflect how far fish are expected to move, the scale at which habitats might be being selected, and the presence of any disturbance (or enhancement). Presence/absence of fish is then related to habitat characteristics, such as water depth, velocity, bank type, substrate, etc. When stakeholders need information about abundance, the models can give broad information about 'high,' 'medium,' and 'low' "states" of occupancy if the study and sampling are set up to achieve this. Also, unlike any other model, occupancy studies consider the probability of detection – that is, if no fish were captured or observed, what was the chance that the fish were there, but weren't found? The probability of detection can then be related to habitat variables. For example, we might be less likely to find fish in a stretch of stream with large boulders – not because there are less fish, but simply because they are more difficult to catch. Probability of detection can also be related to factors such as the experience of the sampler, the substrate, and the weather. When we explicitly take into account how our ability to catch fish is affected by external factors, we are much better able to model the types of habitats that fish are using.

Habitat use by Arctic Grayling is complex, and varies between systems based on local conditions (Stewart et al. 2007). It is suspected that the majority of Arctic Grayling in the Meadowbank region exhibit an adfluvial life history and consequent use of habitat; adult adfluvial Grayling migrate during spring freshet from overwintering lake habitats into small streams to spawn. Eggs incubate for 13-18 days before hatching (Stewart et al. 2007), after which young-of-year (YOY) rear in the stream throughout the summer before migrating to overwintering lakes prior to/during freeze-up. Occupancy surveys can focus on any life stage, but focus on the YOY stage is often important for quantifying recruitment. For Grayling, determining the presence/absence of rearing YOY in streams, and relating presence/absence to habitat variables, can accomplish this.

As a component of previous fish habitat compensation plans, Agnico Eagle has constructed stream enhancements that focus on spawning habitat for Arctic Grayling. Use of the enhanced areas has been monitored over a number of years using abundance surveys. At the request of the hamlet of Baker Lake, the next large habitat enhancement will focus on upgrades to wastewater treatment facilities that service the community, and improvements to water quality are expected. Both of these habitat manipulations provide an opportunity to evaluate use of occupancy models for Arctic Grayling in the region.

8.8.2.4.5 Objectives

Occupancy models for Arctic Grayling in the area of interest will be developed. A comparison of model fit and predictors of Arctic grayling habitat use with those observed in the NWT will be completed. Altered systems (e.g., streams with enhancements) will also be compared to reference systems.

8.8.2.4.5.1 Methods

Methods will involve characterizing occupancy of Arctic grayling in relation to stream habitat characteristics. This will occur through presence-absence surveys for rearing young-of-year (e.g., visual, electrofishing) and assessment of habitat characteristics (e.g., stream width, depth, velocity, vegetation cover, bank formation, distance to overwintering habitat) for 50-m stream segments (number of replicates to be determined through initial field surveys). Study sites will include impacted as well as reference systems in the Meadowbank area. Reference systems in the surrounding region will be selected based on both suitability and ease of access. It is anticipated that most sites will be within proximity to the all-weather road between Baker Lake and Amaruq.

8.8.2.4.5.2 Timeline

Initial reconnaissance and habitat characterizations were conducted in summer 2018 and will be used to direct the study design for the project. It is anticipated that the main study will include two field seasons (summer 2019 and 2020) that will consist of approximately three weeks of surveys in July and early August, when YOY are most likely to be present in the stream systems.

8.8.2.4.5.3 Project Deliverables

By no later than February 1 of each year during the term of the Agreement, the University will provide a brief report and summary of the data collected to the Client and thereafter to the Meadowbank Fisheries Research Advisory Group (MFRAG). The report will outline collection activities, preliminary results, and proposed future activities, and include the notice of intent to publish or present, as applicable.

Communication of study results to the scientific community will be provided through development of one or more peer-reviewed manuscripts. Target peer-reviewed journals include the Canadian Journal of Fisheries and Aquatic Sciences, Arctic Science, Arctic. The development and publication of occupancy models for this region will assist proponents and regulators in future assessments of potential new project impacts and design of offsetting measures for Arctic grayling habitat.

The research team will also aim to present study results at the Canadian Conference for Fisheries Research.

8.8.2.4.6 End-Pit Lake Habitat Suitability Assessment

As required by DFO Authorization 16HCAA-00370 Condition 4.2.1.3: ***The proponent shall initiate a literature review no later than November 2018, and provide the results of this review to DDO no later that February 28, 2019. This shall include an outline of the proposed studies by February 28, 2019, and a complete detailed research plans by December 31, 2019***

The requested literature review and preliminary study outline was provided to DFO by email on March 15, 2019. See Appendix 42.

8.8.2.4.7 eDNA Methods Development

In November, 2018, a Research Agreement was signed between University of Manitoba researchers and Agnico Eagle for the complementary measures project "eDNA Methods Development", as described in Section 2.4, Appendix C of the Whale Tail Pit Fish Habitat Offsetting Plan (May, 2018) and approved by DFO according to Fisheries Act Authorization 16HCAA-00370. The Research Plan for this project as described in the Research Agreement is provided below.

8.8.2.4.7.1 Summary

Traditional fish population monitoring techniques which rely on field catches remain problematic particularly in remote Northern locations due to non-standardized sampling methods, high costs, labour intensity, and their invasive nature. eDNA methods present a potentially useful tool for rapid and non-invasive assessments of fish communities but have not been significantly developed or validated for Arctic systems. The main goal of this project is to develop and optimize monitoring tools based on eDNA metabarcoding technology to assess fish species assemblages (presence/absence and relative abundance) in the Kivalliq region.

8.8.2.4.7.2 Introduction

eDNA methods present a potentially useful tool for rapid and non-invasive assessments of fish communities, but have not been significantly developed or validated for Arctic systems. With their relatively low biodiversity and frequently isolated populations, Arctic lakes present a compelling location for eDNA research.

Since assessments of fish communities are conducted frequently for monitoring, fishout, or research purposes across the Meadowbank site, there are regular opportunities to pair eDNA analyses with data from traditional surveys, or to develop stand-alone research studies. Agnico is interested in developing tools for estimating fish abundance and biomass, as well as furthering field tests for determining species presence/absence.

As a complementary measure for the Whale Tail Pit project, Agnico is proposing to provide partial support for the University of Manitoba COGRAD group's project on development and optimization of non-invasive monitoring tools based on DNA metabarcoding technology to measure fish species assemblage in the Kivalliq Region of Nunavut. This project is currently being supported in part by the KIA, and in 2017 Agnico provided transit and accommodation onsite for two researchers to conduct an initial field reconnaissance and sample collection. The background, preliminary objectives, methods, and deliverables of this project as provided by the COGRAD research group are described below.

8.8.2.4.7.3 Background

It is necessary to efficiently monitor water quality and assess fish species distributions in aquatic ecosystem for their effective management and conservation. Traditional monitoring techniques which rely on physical identification of species remain problematic due to non-standardized sampling methods, cost, labour intensity, and their invasive nature. Traditional methods become even more difficult in remote

Arctic areas. Hence, there is an urgent need for alternative, efficient and customized techniques for large-scale monitoring of fish populations.

Recently, the environmental DNA (eDNA) method for the direct detection of specific DNA from water has been recognized as a powerful tool for monitoring aquatic species. eDNA– defined as: genetic material obtained directly from environmental samples without any obvious signs of biological source material – is an efficient, non-invasive and easy-to-standardize sampling approach. Coupled with sensitive, cost/field time-efficient and ever-advancing DNA sequencing technology, it may be an appropriate candidate for the challenge of biodiversity monitoring in remote Arctic areas.

8.8.2.4.7.4 __Objectives__

The main goal of this project is to develop and optimize monitoring tools based on eDNA metabarcoding technology to assess fish species assemblages in the Kivalliq Region of Nunavut and population changes near the Amaruq mine site.

Objectives are:

1) Development and optimization of the eDNA metabarcoding technique adapted for arctic and mining environment aiming the Amaruq site and utilizing the method as a substitute for current fish species determination approaches.

2) Producing guidelines for handling and analyzing of samples and deliver the method and provide training to the local community.

3) Produce long-term reliable and precise baseline data on the distribution of aquatic associated fish species in the Amaruq mine site lakes using developed eDNA technology.

4) Producing data on the physiochemical properties of the lake water including dissolved mineral content to understand if any changes in stated parameters affect the eDNA/fish assemblage results.

5) Examine the impact of flooding Whale Tail Lake South Basin with the coincident changes in physiochemical properties of the aquatic area (e.g., increase in turbidity, dissolved solids) on the fish population using developed eDNA technique.

6) Collecting baseline eDNA and water quality data on lakes nearby Amaruq mine site outside the mining activity (potential candidates include B3 or DS1) and use them as a control for population changes.

8.8.2.4.7.5 __Methods__

A 5-year plan is proposed that would involve development and utilizing eDNA metabarcoding approach in order to measure fish assemblages in the Amaruq areas. Environmental DNA metabarcoding technology will be developed and optimized to detect fish species including Arctic Char, Arctic Grayling, Lake Trout, Round Whitefish, Burbot, Slimy Sculpin, Ninespine Stickleback, Hybridized Lake Trout/Arctic Char and analyze their relative abundances. For water quality data, temperature, pressure, dissolve oxygen, pH, salinity, conductivity, and dissolved metals including Cu/ Zn/ Cd/Fe/Hg/Mn will be measured (some metrics may be obtained through regular compliance monitoring programs).

The first round of sampling was done before mining activity starts (July 2017). The second round of sampling was done in August, 2018, during construction. Additional sampling will be completed during and after flooding (2019, 2021). The results will be used to assess the influence of mining activity on changes in fish species populations, as measured through eDNA methods.

8.8.2.4.7.6 ***Timeline***

This project is currently proposed to occur over an additional three year field study period (2018, 2019, 2021), and a five-year total time frame.

8.8.2.4.7.7 ***Project Deliverables***

For all proposed studies, general criteria for success as offsetting measures are described in the Fish Habitat Offset Monitoring Plan (March, 2018). An annual report to the MFRAG will be a study requirement.

Results and methods developed through this study will be made available in the peer-reviewed scientific literature, as well as through national and international conference presentations by the research team. Potential target journals include: Molecular Ecology Resources, Environmental Science and Technology, Journal of Applied Ecology, PLoS ONE, or Freshwater Science.

8.9 MEADOWBANK FISHERIES RESEARCH ADVISORY GROUP (MFRAG)

As required by DFO Authorization 16HCAA-00370 Condition 4.2.1.4: ***To serve as an advisory group for the complementary measures that shall be undertaken as listed under condition 4.2.2.1, the Proponent shall establish a Meadowbank Fisheries research Advisory Group (MFRAG). The MFRAG membership shall include DFO and the Proponent, an independent third party research advisor, any interested Inuit organizations within the Kivalliq Region, and other agencies or interested parties s considered appropriate by MFRAG members. The proponent shall develop a draft terms or reference and participant list for this advisory group which shall be provided to DFO by September 1, 2018.***

Following receipt of DFO Fisheries Act authorization 16HCAA-00370 for the Whale Tail site in July, 2018, Agnico focused on developing Research Agreements with academic institutions for the complementary measures described in Appendix C of the Whale Tail Pit Fish Habitat Offsetting Plan (May, 2018). Research Agreements were required to be in place prior to establishment of the MFRAG, in order to develop the terms of reference for the group. As of February, 2019, Research Agreements for complementary measures projects have now been signed (with the exception of the planned study on end pit lake habitat suitability – see Section 8.8.2.4.6), and Agnico has begun developing a framework for the MFRAG group. To this end, Agnico has reached out to academic partners with similar previous advisory group experience (meeting February 7, 2018) and is looking to identify other such groups in the industry to draw on lessons learned. Agnico is targeting an initial meeting of the MFRAG in summer 2019, following receipt of annual research summary reports, due May 30 annually according to FAA 16HCAA-00370 Condition 4.2.1.5. During this initial meeting, it is envisioned that reports will be reviewed and terms of reference will be signed by the MFRAG members.

8.10 MAMMOTH LAKE TROPHIC CHANGES

As required by NIRB Project Certificate No.008 Condition 23:. ***The Plan for undertaking these additional studies and associated monitoring should be submitted to the NIRB at least 30 days prior to operations, with updates submitted annually thereafter or as may otherwise be required by the NIRB. A report on the results of***

these studies and associated monitoring should be provided at least 30 days prior to closure. The Proponent shall, reflecting any direction from Environment and Climate Change Canada and Fisheries and Oceans Canada:

a) Conduct additional analysis to support the conclusions that a change in trophic status in Mammoth Lake would not impact fish productivity;

This will be assessed via a Research Agreement signed between University of Waterloo researchers and Agnico for the complementary measures project assessment of changes in aquatic productivity and fish populations due to flooding of Whale Tail South and downstream lakes during operations (Section 8.8.2.4.1). This study combined with the CREMP conducted annually will be used to support the conclusions that a change in trophic status in Mammoth Lake would not impact fish productivity.

b) Undertake additional site-specific studies to assess the predicted trophic change on lake ecosystem productivity to monitor potential changes to downstream environments; and

Changes in ecosystem productivity for Mammoth Lake and downstream lakes (A76) will be investigated through a site-specific study conducted by University of Waterloo (UW) researchers in partnership with Agnico. A research agreement for this project was signed in late 2018. Please refer to Section 8.8.2.4.1 for details of the study plan. Baseline analyses were completed in 2018, and included small-bodied fish sampling (shoreline electrofishing), and water chemistry sampling. A summary of sampling activities by lake is provided in Table 8.103.

Table 8.103. Whale Tail Summary of sampling conducted during summer 2018 for Mammoth and downstream Lakes

Category	Waterbody	Shoreline Electrofishing	Water Chemistry
Impact	Whale Tail (south basin)	Y	Y
	Mammoth	Y	Y
	A20	Y	Y
	A65	Y	Y
	A63	Y	Y
Mid-field	A76	N	Y
Reference	Nemo	N	Y
	Lake 8	Y	Y

Shoreline electrofishing was completed on five flood-impacted lakes and one reference lake (in future, more reference lakes will be included), with the aim of collecting small-bodied fish for trophic ecology and growth parameters. Among lakes, slimy sculpin (Cottus cognatus) was the only small-bodied fish species that was successfully captured in high numbers. For each lake, 50 individuals were targeted and preserved in formalin for future analyses of condition, and 30 individuals were targeted for stable isotope sampling (frozen).

Water chemistry sampling was completed on five flood-impacted lakes, one mid-field lake (i.e., downstream of the flood impacted lakes), and two reference lakes. Samples were collected during Core Receiving Environment Monitoring Program (CREMP) field work at CREMP established sites, with the exception of lakes A65 and A63, which are not included in the CREMP program.

c) Monitor actual loadings/concentrations in the receiving environment, identify trends in downstream chemistry and productivity, and track trophic status of Mammoth Lake

Changes in actual loadings/concentrations of parameters indicative of nutrient enrichment will be monitored in the receiving environment (Mammoth Lake, A76, DS1) through the UW study described above, as well as through the CREMP. Water quality sampling is conducted monthly during April/May, June, July, August, and November/December, and results are reported annually. Trends in downstream chemistry are identified on an annual basis as part of this program.

8.11 FISH-OUT PROGRAM SUMMARY*

8.11.1 Meadowbank Site

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

No fishout program occurred in 2018.

8.11.2 Whale Tail Site

As required by DFO Authorization 16HCAA-00370 Condition 2.4: ***The proponent shall provided a final fish-out plan to DFO at least three weeks prior to commencing the fish-out program to allow for review and approval***

And

As required by DFO Authorization 16HCAA-00370 Condition 3.2.1: ***All fish-out results shall be provided to DFO in a fish-out monitoring report within 2 months of the completion of a fish-out program. In addition, the Proponent shall provide DFO with photocopies of all field data/notes, copies of photographs with GPS coordinates and an electronic database of data collected and result of all sample analyses. This condition shall be followed in accordance with the General Fish-out Protocol for Lakes and Impoundments in the Northwest Territories and Nunavut***

The fishout of Whale Tail Lake (North Basin) at the Meadowbank site took place from August 13th to September 28th, 2018, and followed the Conceptual Whale Tail Lake (North Basin) Fishout Work Plan (February 2017), which was developed in consultation with the retained fisheries consultant (North/South Consultants Ltd.) and the Fisheries and Oceans Canada (DFO). The fishout was also approved under the Animal Use Protocol (AUP) The complete report can be found in Appendix 43. Below is a summary of the major findings regarding the Whale Tail North Fishout.

The fishout consisted of a 2-day trial phase, a catch-per-unit-effort (CPUE) phase, and a final removal phase. During the CPUE phase (August 13 – September 23), fish removal was undertaken during the daytime using a standard unit of gillnet effort to collect population data and maximize successful transfer of fish to the adjacent Whale Tail Lake (South Basin). Initial abundance was estimated daily during the CPUE phase using both the Leslie and DeLury population estimate methods.

The final removal phase was initiated with DFO approval on September 24th, when the higher population estimate method (DeLury) indicated that over 98% of fish had been removed. The fishout was terminated on September 28 when Whale Tail Lake froze.

With all effort combined, a total of 3078 fish weighing 776 kg and consisting of four species (Arctic Char, Burbot, Lake Trout and Round Whitefish) were captured. The live transfer rate combining all phases was 79%. Abundance and biomass for each species are shown in Table 8.104. Lake Trout and Round Whitefish represented the most abundant species at 42% and 45% of the total catch, respectively.

Table 8.104. Total abundance and biomass by species for the fishout of Whale Tail Lake (North Basin).

Species	Abundance		Biomass	
	# Fish	%	kg	%
Arctic Char	217	7	79.4	10
Burbot	192	6	34.1	4
Lake Trout	1,288	42	410.3	53
Round Whitefish	1,381	45	252.8	33
TOTAL	**3,078**	**100**	**776.6**	**100**

Length and weight were recorded for nearly all fish captured. Gender, maturity and/or reproductive status were also assessed for a subset that did not survive capture or transfer (434 fish). A smaller subset (up to 96 fish) that did not survive underwent a detailed biological assessment including: stomach fullness, gonad weight, and liver weight. Muscle tissue samples and aging structures (otoliths) were collected and stored. Fish were generally determined to be in good health, with average condition factors >1 for all species.

At the completion of the fishout, the population estimates (incorporating the extra effort net sets) were 2878 (Leslie method) and 3084 (DeLury method). Based on the highest estimate (DeLury) which included all fish removed from the CPUE and final removal phases (2981 fish), approximately 97% (>100 mm) were removed from the lake.

Overall, the objectives of the Whale Tail Lake fishout were met:

- the local community was engaged;
- a large proportion of the fish in the area to be dewatered were either rescued and released or fully utilized by traditional resource users; and
- ecological information (biological, limnological, and habitat) was collected to contribute to our understanding of productivity in Arctic lakes in the Northwest Territories and Nunavut.

8.12 AEMP

8.12.1 Introduction

The Aquatic Effects Management Program (AEMP) for the Meadowbank site was developed in 2005 as part of the project's Final Environmental Impact Statement (FEIS) (AEMP 2005), and has been formally implemented since 2006. In December 2012, the AEMP was restructured to serve as an overarching "umbrella" program that conceptually provides an opportunity to integrate results of individual, but related, monitoring programs in accordance with NWB Type A Water License 2AM-MEA1526 requirements. The scope of the 2005 AEMP is now included as one of the monitoring programs that are integrated under the restructured AEMP, and has been renamed the Core Receiving Environment Monitoring Program

(CREMP). In 2018, Agnico received NWB Type A Water License 2AM-WTP1826, which stipulates that the AEMP (Version 3, November, 2015) shall also be implemented for the Whale Tail site.

The 2018 AEMP synthesis report therefore aims to fulfill the following objectives for both the Meadowbank and Whale Tail sites:

- Identify potential sources of impact to the receiving environment and verify the conceptual site model;
- Summarize the results of each of the underlying monitoring programs, including the CREMP (the cornerstone broad-level receiving environment monitoring program);
- Review the inter-linkages among the monitoring programs;
- Integrate the results for each component program;
- Identify potential risks to the receiving aquatic ecosystem; and
- Provide conclusions and recommend additional management actions that should be considered in future monitoring.

8.12.2 Potential Sources of Impacts and the Conceptual Site Model (CSM)

The AEMP is founded on a conceptual site model, which is used in ecological risk assessment to help understand potential relationships between site activities and the environment (e.g., water quality or certain ecological receptors). The conceptual site model (CSM) is presented in Table 8.105 and consists of the following elements:

- Stressor sources –the sources of chemical (e.g., metals) or physical (e.g., total suspended solids) stressors that can potentially impact the environment.
- Stressors –the actual agents that have the potential to cause adverse effects to the receiving environment.
- Transport pathways –the ways in which a stressor is released from the source to the receiving environment.
- Exposure media –the media where a stressor occurs in the receiving environment. A single stressor might actually end up in multiple exposure media, with different ones being most important at different times. For example, if an effluent contained mercury, it would initially be found in the water column, and then most likely would settle to sediments where it would then enter the food chain (i.e., biota tissue).
- Receptors of concern –ecological entities selected for a variety of reasons, usually including sensitivity to relevant stressors and perceived ecological importance (i.e. could be determined to be valued ecosystem components).

In 2018, all of the potential pathways, exposure media and receptors of concern listed in Table 8.105 were relevant to the AEMP analysis and were evaluated.

Table 8.105. Primary transport pathways, exposure media, and receptors of concern for the AEMP.

Transport Pathways	Exposure Media	Receptors of Concern
		a, g Phytoplankton
g,i Effluent		g Zooplankton
f Groundwater	a,d,f,g,h,i,k,m Water	d,g,h Fish
i,k Surface water	a Sediments	a,h Benthic community
m Air	h Tissue	d Periphyton
NA Direct		a,d,k Fish habitat

Notes:

- a Core Receiving Environment Monitoring Program
- ~~b~~ ~~Effects Assessment Studies~~
- ~~c~~ Dike Construction Monitoring
- d ~~Habitat Compensation Monitoring Program~~
- e ~~Dewatering Monitoring~~
- f Groundwater Monitoring
- g MMER Monitoring
- h EEM Biological Monitoring Studies
- i Water Quality and Flow Monitoring
- j Fish-Out Studies
- k AWAR and Quarry Water Quality Monitoring
- l Blast Monitoring
- m Air Quality Monitoring
- NA Direct, so measured in exposure medium.

Note: ~~strikethrough~~ text is an "AEMP" monitoring program that was not required to be completed in 2018

8.12.3 Meadowbank Site AEMP

8.12.3.1 Summary of Results of AEMP- Related Monitoring Programs

In 2018, in accordance with the NWB Type A Water Licenses, AEMP-related monitoring programs for the Meadowbank site included:

- the Core Receiving Environment Monitoring Program (CREMP);
- Groundwater Monitoring;
- Metal and Diamond Mining Effluent Regulation (MDMER) Monitoring;
- Minesite Water Quality and Flow Monitoring (and evaluation of NP-2 and mill seepage);
- EEM Biological Monitoring Studies;

- Visual AWAR Water Quality Monitoring
- Blast Monitoring;
- Air Quality Monitoring

The results of these monitoring programs are integrated in the AEMP, and assist in the evaluation of potential effects of mining activities on the aquatic environment.

Programs that are part of the AEMP model but were not required to be conducted in 2018 for the Meadowbank site include lake dewatering monitoring, habitat compensation monitoring, dike construction monitoring and fish-out studies.

Air quality, the EEM Biological Studies and the Habitat Compensation Monitoring Program were considered as part of the conceptual site model and are included in the AEMP discussion to inform the process, but these programs are not a requirement of the Type A Water License; Part I-1. Results are summarized and are used as necessary to inform the identification and discussion of potential risks to the receiving aquatic ecosystem.

Summaries of each AEMP monitoring program are provided below. Table 8.106 further summarizes the results of these programs in 2018 for the Meadowbank site. For detailed results on individual monitoring programs, refer to the appended reports.

Overall, while some additional monitoring activities are recommended for subsequent years, none of the site specific stressors, effects-based triggers or guideline exceedances observed through these programs had the potential to cause significant risks to the aquatic receiving environment requiring immediate changes in management actions.

Table 8.106. Summary of aquatic effect monitoring program results for the Meadowbank site in 2018.

	Core Receiving Environment Monitoring Program	Effects Assessment Studies	Dike Construction Monitoring	Habitat Compensation Monitoring Program	Dewatering Monitoring	MDMER Monitoring	EEM Biological Monitoring Studies	Water Quality and Flow Monitoring	Fish-Out Studies	Visual AWAR and Quarry Water Quality Montoring	Blast Monitoring	Groundwater Monitoring
Completed in 2018?	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**Yes***	**Yes**	**No**	**Yes**	**Yes**	**Yes**
Stressor Variables												
suspended solids	○					○	NA	○		○	NA	●
sediment deposition	NA					NA	NA	NA		○	NA	NA
water-borne toxicants	○					○	NA	○		NA	NA	○
sediment toxicants	●					NA	NA	NA		NA	NA	NA
nutrients	○					○	NA	NA		NA	NA	○
other physical stressors	●					NA	NA	NA		NA	○	●
Effects Variables												
Phytoplankton	○					NA	NA	NA		NA	NA	NA
Zooplankton	NA					NA	NA	NA		NA	NA	NA
Fish	NA					NA	○	NA		NA	NA	NA
Benthic invertebrate community	○					NA	○	NA		NA	NA	NA
Periphyton	NA					NA	NA	NA		NA	NA	NA
Fish habitat	NA					NA	NA	NA		NA	NA	NA

Notes:

*EEM Biological Study completed in 2017 and reported after Mar 31, 2018

○ No observed effects

● Trigger or guideline exceedance - early warning explained in report

⬤ Observed effects explained in report (applies to effects variables)

8.12.3.1.1 Meadowbank CREMP

Water Quality

The CREMP determined that, as in the past, there were some statistically significant mine-related changes relative to baseline/reference conditions identified in 2018 at one or more near-field areas. Parameters that exceeded their respective triggers were: alkalinity (TPE, SP); conductivity (TPN, TPE, SP, WAL); hardness (TPN, TPE, SP, WAL); major cations (i.e., calcium, potassium, magnesium, and sodium [TPN, TPE, SP, WAL]); and TDS (TPN, TPE, SP, WAL). In the absence of effects-based thresholds (e.g., CCME water quality criteria) for these parameters, their triggers were set at the 95th percentile of baseline data. While these results represent mine-related changes, the observed concentrations are still relatively low and there is no evidence to suggest concentrations are increasing year-over-year or that the observed concentrations would result in adverse ecological effects. Consistent with previous reporting cycles, there were no trigger exceedances in 2018 for any water quality parameters with CCME water quality guidelines, including metals. In the context of the FEIS, the magnitude of potential effect on water quality in each of the near-field lakes in 2018 was considered low (i.e., less than 1x the CCME WQGs) and consistent with predictions.

Sediment - Core and Grab Sample Analysis

Quantitative trigger analysis was completed on metals data from the follow-up targeted sediment coring program at TPE and WAL to verify the apparent increases in sediment metals concentrations observed in 2017. Grab samples were also submitted for analysis from the NF and reference areas in 2018 for analysis of habitat variables (particle size and TOC), metals, and organics analysis on the top 3-5 cm of sediment.

Chromium concentrations at TPE increased steadily between 2009 and 2013. The suspected cause of the increase is ultramafic rock used to construct the Bay-Goose Dike in 2009 and 2010. Chromium exceeded the trigger value in 2018, but the concentrations were less than those reported in 2017. Natural sedimentation rates in these lakes are low, and the lower reported chromium concentrations in 2018 (which were also seen in 2016) suggest chromium concentrations can vary significantly over a small spatial area. There is conclusive evidence that chromium has increased in the sediments at TPE relative to the baseline period; however, high annual variability in chromium concentrations observed between 2017 and 2018 suggests concentrations have stabilized. A repeat of the coring program is recommended in 2019 to provide three-consecutive years of core chemistry data for interpreting the temporal trend in chromium concentrations.

For Wally Lake, 2017 was the first year of Before-After analysis of sediment core chemistry. Arsenic, and to a lesser extent chromium and lead exceeded the trigger values specific to WAL in 2017, but there was uncertainty about whether the exceedances were indicative of a “real” temporal trend or an artefact of spatial heterogeneity in metals concentrations. The 2018 core chemistry results exceeded the trigger value for arsenic. Chromium and lead were less than their respective trigger values in 2018 (i.e., within the range of baseline concentrations). In the case of arsenic, the mean concentration was lower in 2018 (46.6 mg/kg) compared to 2017 (61.8 mg/kg). These results confirm that there is considerable spatial variability with the sediment basin in WAL. No follow-up studies are recommended for WAL, TPN, or SP in 2019 beyond routine sediment grab sampling to support the benthos community assessment.

Sediment – Metals Bioavailability Analysis

Targeted studies were also completed at TPE in 2018 to further assess mining-related changes to sediment chromium concentrations at TPE. A bioavailability study conducted in 2015 showed low metals availability and low toxicity. The 2015 sediment toxicity test was repeated in 2018. Key findings from the 2018 study are:

- The amphipod test showed substantial effects to survival, but these were not correlated to sediment chromium concentrations. The cause of impaired survival in TPE sediments is unclear, but the results suggest other exposure pathways (e.g., porewater) or stressors (e.g., physical or chemical; not chromium) may be responsible for the toxicity seen in 2018. Confounding the assessment is the fact that three of the five replicates in the amphipod test had complete mortality, while one had 100% survival.

- The chironomid test did not show any effects to survival at TPE in 2018, but did have reduced growth (-21%) relative to the field controls (INUG/PDL). Given their dominance in the benthic invertebrate communities of the Meadowbank study lakes, the chironomid toxicity test results are considered more ecologically relevant for this site than amphipod test results.

A weight-of-evidence approach was used to integrate the results of the routine and targeted studies at TPE in 2018. While there was some toxicity to chironomids (reduced growth), the highest weight was applied to the field survey data for the benthic community at TPE, which showed stable or improving results for total abundance and taxa richness over the last six years that were consistent with the baseline range. The complete weight-of-evidence assessment determined that currently, concentrations of metals at TPE are not posing risks to the benthic community. That said, there are uncertainties regarding the exact cause of the observed effects to *H. Azteca* (benthic) survival in 2018 that warrant follow-up in 2019 to provide added assurance that bioavailability is not changing at TPE. Amphipods are not reflected in the natural benthos community present in the study areas; however, as an “indicator” taxon, the results from 2015 and 2018 provide important information about how exposure conditions have changed over time. *H. azteca* is more sensitive to the effects of pollution than *C. dilutes* (benthic), and from a site management perspective, the *H. azteca* test results serve as the equivalent of an “early warning trigger” for detecting changes in sediment chemistry before more ecologically significant effects to *C. dilutus* are detected.

Two recommendations for 2019 to help better understand risks to the benthic invertebrate community at TPE: (1) continue scrutiny of trends in benthic invertebrate abundance and richness at TPE, and (2) repeat the sediment toxicity testing (chironomid and amphipod tests) at TPE in 2019 with the addition of porewater sampling to try to determine the cause of the reduced chironomid growth and amphipod survival in TPE sediments.

<u>Phytoplankton and Invertebrate Communities</u>

While some changes to phytoplankton or benthic invertebrate community metrics were observed in the 2018 CREMP analysis, none were identified as mine-related.

Results of the CREMP are further summarized in Table 8.107.

Table 8.107. Summary of 2018 CREMP results for the Meadowbank site (Appendix 31: 2018 CREMP Report, Table ES-1). Figure/Table/Section referenced in this Table are the one from the Appendix 31.

Monitoring Component (and CREMP report section)	**Variable**	**Summary**	**Temporal and Spatial Trend Assessment**[1, 2]
Limnology Section 4.2	Oxygen and Temperature	The limnology profiles collected in 2018 show dissolved oxygen and temperature readings are consistent with range of conditions typical of previous monitoring cycles.	There is no evidence to suggest seasonal fluctuation in dissolved oxygen and temperature among the NF study area lakes is attributed to mining site-related activities.
	Conductivity	Specific conductivity measurements were well within the range of normal conditions defined as < 75 µS/cm for most measurements collected from the study areas in 2018. Three measurements taken at WAL from between 5 and 7 m (near bottom) were above the normal range in the May event (see **Figure 4.7**). Conductivity returned to approximately 40 µS/cm by July and remained stable for the remainder of the year.	**Spatial scale** – **localized**; slightly elevated conductivity at one of the sampling locations at WAL in the May event **Temporal trend – sporadic**; conductivity returned to normal levels in July and stayed consistently low throughout 2018. **Causality – low;** the ‘apparent’ increase at one sampling location in WAL in May was not considered mine related for two reasons: 1) there was no discharge to WAL in 2018 2) conductivity was higher than normal reference area PDL in the same event.

Monitoring Component (and CREMP report section)	**Variable**	**Summary**	**Temporal and Spatial Trend Assessment**[1, 2]
Water Chemistry Section 4.3	Conventional Parameters and Major Ions	Alkalinity, conductivity, hardness, major cations and TDS exceed their trigger values at one or more NF areas in 2018. The trigger values for these parameters is set at the 95th percentile of concentrations measured during the baseline period. There are no thresholds (i.e., CCME water quality guidelines) for these parameters.	**Spatial scale – widespread;** concentrations have increased lake-wide in Third Portage from TPE to TPN and between lakes (SP and WAL). **Temporal trend – stable;** concentrations are elevated relative to the baseline period according to the BACI analysis, no evidence of-year-over-year increases (i.e., concentrations in 2018 are similar to 2017, 2016, 2015, …). **Causality – high;** the spatial pattern and temporal trend of increasing concentrations in the 'after' period is plausibly attributed to activities at the mine.
	Nutrients	No trigger exceedance (i.e., concentrations = baseline)	Nutrient concentrations are similar to baseline as evidenced by no trigger exceedances in 2018.
	Metals (total and dissolved)	No trigger exceedance (i.e., concentrations = baseline)	Metals concentrations (total and dissolved) were consistently low or below their respective MDLs at the NF, MF, and FF locations in 2018.
Phytoplankton Section 4.4	Chlorophyll-a	This no trigger for chlorophyll-a for the CREMP.	Concentrations in the reference area samples typically range between 0.2 and 0.7 µg/L in summer months, reflecting the oligotrophic, nutrient poor condition of these lakes; a trend that has not changed over time.
Phytoplankton	Total Biomass	Increases in phytoplankton biomass were detected at NF areas in 2018 relative to baseline/reference conditions. The magnitude of the increase ranged from 39% to 58% at SP. The only statistically significant change (i.e., increase) was at WAL ($p<0.1$). There was no discharge to WAL in 2018 and nutrient concentrations (i.e., nitrogen and phosphorus) were similar to baseline (**Section 4.3**).	**Spatial scale – widespread**; phytoplankton biomass was elevated at all NF areas relative to baseline/reference conditions in 2018. **Temporal trend – stable;** historical biomass for the NF areas (**Figure 4-55**) do not show obvious visual signs of temporal increases for individual NF study areas. **Causality – low** SP was the only NF area that received effluent discharge in 2018. The magnitude of the change in biomass at the other NF areas suggests the observed pattern of increase in phytoplankton biomass is likely annual variability in the community rather than mine-related.
	Taxa Richness	A statistically significant increase (29%; $p=0.03$) in taxa richness was noted at TPN in 2018 relative to baseline/reference conditions, and the effect size was above the 20% trigger level (**Table 4-6**).	**Spatial scale – localized**; increased taxa richness relative to reference/baseline conditions was only evident at TPN. **Temporal trend – sporadic**; richness has remained stable during the 'after' period. The apparent increases richness at TPN in 2018 relative to baseline/reference conditions is likely an artefact of natural fluctuation in the community composition rather than a decrease. **Causality – low**; the 'apparent' increase in richness at TPN is not plausibly attributable to any site-related activities.

Monitoring Component (and CREMP report section)	**Variable**	**Summary**	**Temporal and Spatial Trend Assessment**[1, 2]
Sediment Chemistry Section 4.5	Metals	Targeted coring was completed at TPE and WAL in 2018 to verify increasing concentrations of arsenic at WAL and chromium at TPE in the 2017 CREMP. Sediment toxicity tests were also conducted to assess the bioavailability of sediment metal to 2 benthic invertebrate species (*Chironomus dilutus* and *Hyalella azteca*). Core chemistry results from WAL and TPE were compared to site-specific triggers/thresholds. Parameters with mean concentrations exceeding the trigger value are formally tested using a before-after (BA) statistical model to assess whether concentrations are increasing over time.: **TPE -** Chromium concentrations continue to exceed the trigger in core samples collected in 2018. - slight reduction in *C. dilutus* growth relative to reference.- effects to *H. azteca* survival compared to reference. **WAL -** Arsenic concentrations in core samples collected in 2018 exceeded the trigger value.- No effects to survival or growth in the sediment toxicity tests.	**Spatial scale – localized**; temporal increases in chromium are limited to TPE. Other areas (SP and TPN) are not showing similar trends of increasing chromium in sediment. Slight increases in arsenic at WAL are confined to WAL. **Temporal trend– stable for TPE and WAL** **TPE** – Chromium concentrations at TPE consistently trended higher between the onset of the mine development in TPE in 2009 (i.e., change in status from “before” to “after”) and 2013 (**Figure 4-63**), The pattern since 2013 has been variable. Chromium concentrations were lower in 2018 (150 mg/kg) compared to 2017 (200 mg/kg), demonstrating that concentrations are not likely increasing year-over-year. **WAL –** Mean arsenic concentrations in 2018 (46.6 mg/kg) was substantially lower relative to 2017 (62 mg/kg). No evidence to suggest arsenic concentrations are increasing year-over-year, but current concentrations are ~50% higher relative to baseline coring results (before 2013). **Causality – high (TPE; low (WAL);** increasing concentrations of chromium in sediment at TPE were likely related to use of ultramafic rock for dike construction. At WAL, the highly-variable arsenic concentrations in 2018 and 2017 are likely partly related to natural heterogeneity in sediment metals concentrations.
	Organics (PAHs)	Sediment hydrocarbon concentrations were below detection for all NF area grab samples in 2018.	Hydrocarbons are not contaminants of potential concern for the CREMP based on recent and historical results. There have been no instances of measured concentrations attributable to site-related activities during the monitoring period.
Benthos Section 4.6	Total Abundance	Benthic invertebrate communities at the NF areas were monitored in 2018. Decreased abundance at TPE relative to INUG in the past four years relative to reference/baseline conditions. Statistically significant differences were noted for the 3 after period (2016-2018) and 4 year after period (2015-2018). The differences are primarily driven by increased abundance at INUG during the monitoring program while abundance at TPE has been relatively stable and consistent with baseline sampling results.	**Spatial scale – localized**; lower abundance (based on the BACI analysis) observed only at TPE. **Temporal trend – stable**; abundance (absolute values) at TPE show stable or improving results over the last six years and consistent with the range observed in baseline. Absolute total abundance at TPE in 2018 (~2,500 organisms/m^2) was stable relative to the range of values dating back to 2012 (2,220 to 3,100 organisms/m^2) and was well within its baseline range. **Causality – low**; the ‘apparent’ reduction in abundance at TPE in the BACI analysis is partly an artefact of slightly increasing abundance at the reference area INUG while TPE has remained stable during the operation phase. Sediment toxicity testing in 2018 (see above) showed minor reduction in growth for *C. dilutus* (ecologically-relevant), but chromium concentrations in sediment were not correlated with reduced chironomid growth (see **Section 4.6.3**).
	Total Richness	No changes observed in taxa richness in 2018 at the NF areas compared to reference/baseline conditions.	Richness continues to track higher for most stations. The benthic communities are dominated by chironomids, and the relative proportion of major taxa remains stable at all stations.

8.12.3.1.2 Meadowbank Lake Dewatering Monitoring

No lake dewatering occurred in 2018.

8.12.3.1.3 Meadowbank Groundwater Monitoring

Groundwater well installation and sample collection have been a major challenge in the Arctic conditions at Meadowbank. Beginning in 2017, an outside consultant (SNC Lavalin) was contracted to review, expand, and conduct the groundwater sampling program. The resulting program aimed to better characterize natural groundwater chemistry, potential sources of contaminants at the mine site, and potential links between surface and groundwater. During a May-June site visit, four new monitoring wells were installed. During two subsequent site visits (July and September) the wells were sampled. In total, samples were collected from five groundwater wells, three dike seepage locations, two sumps and one reclaim water location during each event. Prior to water sample collection, the following *in situ* physicochemical parameters were recorded: pH, turbidity, salinity and electrical conductivity, oxydoreduction potential (ORP) and dissolved oxygen (DO). Laboratory-measured analytes included all Group 2 parameters in the Meadowbank NWB Water License: total and dissolved metals, nutrients, conventional parameters, total and free cyanide. No regulatory guidelines or limits apply to groundwater quality in this monitoring program; rather, results are used to support development of site-wide water models, and in particular, eventual water quality in the future re-flooded area of Second and Third Portage Lakes.

Interpretation of 2018 geochemical data aims to provide a global portrait of groundwater quality at the mine site and its potential linkage to surface water of mining activities. Reclaim water in South Cell is a source of sulfate, chloride, sodium, potassium, calcium, manganese, and other trace elements for surface and groundwater on the site. Diluted reclaim water signature can be traced at ST-S-5 (dike seepage sample) and MW-16-01 (monitoring well sample). These monitoring locations are immediately south of the central dike, within the mine footprint. Groundwater collected in 2018 from the four (4) newly installed well fits within the natural groundwater category and results can be use as threshold values to monitor groundwater quality in the future. There is no apparent trending between samples representative of reclaim water, and those representative of natural groundwater. This year, only two categories of water were distinguishable: Reclaim-associated water (ST-S-5 and MW-16-01) and natural background water (new monitoring wells). For those samples identified as groundwater, only alkalinity and in some samples, TSS, exceeded general reference values set at 3x background concentrations in area surface water. This comparison helps inform future water quality predictions, since the dewatered area of Second and Third Portage Lakes is eventually planned to be re-flooded.

8.12.3.1.4 Meadowbank Site Non-Contact Water and Effluent Monitoring

This section includes discussion of results from water quality monitoring under MDMER or the Water Quality and Flow Monitoring Plan for managed non-contact water or water discharged to the receiving environment.

In 2018, only East Dike seepage water was discharged to the receiving environment at the Meadowbank site (Second Portage Lake). No exceedance of the MDMER/NWB Water License criteria occurred.

All results of sampling for non-contact water diversion ditches (East and West) complied with NWB license limits.

In 2013, seepage from the TSF through the Meadowbank WRSF was identified at ST-16, and as a result Agnico initiated a targeted monitoring program for the potential receiving environment in that area (closest receptor being NP-2). In 2018, monitoring continued at NP-2 and at stations requested by the KIA (NP-1, Dogleg and Second Portage Lake). The 2014 – 2018 average analysis results for applicable parameters confirmed no impacts to downstream lakes (NP-1, Dogleg, Second Portage Lake). A valid case can be made that the action plan implemented by Agnico has been very successful in preventing any further seepage into NP-2 Lake and the further receiving environment.

Monitoring in Third Portage Lake in response to the mill seepage through the assay road (identified in 2013) continues to indicate that there has been no impact to the near shore receiving waters of Third Portage Lake. The seepage appears to be effectively contained through construction of an interception trench (2014) and the source area within the mill has been repaired (2015). Follow up monitoring will continue in 2019.

8.12.3.1.5 Meadowbank EEM Biological Monitoring

As required by ECCC, a Biological Monitoring Study (EEM Cycle 3 study) was conducted in 2017 to assess the Wally Lake (Vault Discharge). The Vault discharge was at this time the effluent which has been determined the greatest potential to have an adverse effect on the receiving environment. The study design was submitted to ECCC on February 17, 2017 (Appendix G3 of the 2017 Annual Report). On April 10, 2017 Agnico received comments from the TAP regarding our Cycle 3 Study Design. On April 26, 2017 Agnico responded to these comments (Appendix G4 of the 2017 Annual Report). The study design was and subsequently approved. In June 2018, the Environmental Effect Monitoring Study 3 Interpretative Report was submitted to ECCC.

The EEM Cycle 3 fish population survey indicated no effects of effluent discharge on fish populations in Wally Lake.

While some statistically significant variations were observed for benthic community metrics between Wally Lake and reference systems, the overall composition of benthic community of Wally Lake was very similar to what is observed in the reference lakes, and in Wally Lake during baseline periods, and further contained fauna indicative of high water quality. The benthic community analysis did not indicate a degraded condition relative to the baseline period in Wally Lake.

Sub-lethal toxicity testing of effluent was also conducted as a component of the EEM Cycle 3 study. Measurable growth impairment did not exceed EEM guidelines (IC25<30%) for any test (fathead minnow, *Ceriodaphnia dubia*, *Pseudokirchneriella subcapitata* or *Lemna minor*).

8.12.3.1.6 Meadowbank Fish-out Studies

No fish-outs were conducted at the Meadowbank site in 2018.

8.12.3.1.7 AWAR and Quarries Water Quality Monitoring

Pre-freshet and freshet inspections were conducted at crossings along the AWAR in 2018. These inspections are conducted to document the presence/absence of flow, erosional concerns and turbidity plumes. No flow was observed during the fist inspection conducted on June 5th, 2018. Flow was observed, but no erosional concern or visual turbidity plumes were observed during the freshet inspections conducted on June 8th, June 29th, July 6th and July 27th, 2018. Weekly inspections are also conducted along the AWAR on a year round basis. During the freshet and open water season, any visual turbidity plumes or erosion along the AWAR, culverts or HADD crossings are documented by Environmental Technicians. In 2018, no visual turbidity plumes or erosion were observed.

Regular inspections of quarries along the AWAR were also performed during the year to ensure that runoff, if any, would be free of any visible sheen and would not impact the environment. No issues with runoff water inside the quarries were noted in 2018.

8.12.3.1.8 Meadowbank Blast Monitoring

In 2018, no peak particle velocity (PPV) measurements exceeded the DFO limit of 13 mm/s and instantaneous pressure change (IPC) measurements were all below the DFO limit of 50 kpa.

8.12.3.1.9 Meadowbank Air Quality Monitoring

The objective of this program is to measure dustfall, NO_2, and/or suspended particulates (TSP, PM_{10}, $PM_{2.5}$) at various monitoring locations around the Meadowbank and Whale Tail sites, Meadowbank All-Weather Access Road (AWAR), and Whale Tail Haul Road (WTHR). Results obtained for the measured parameters are compared to Government of Nunavut (GN) Environmental Guidelines for Ambient Air Quality (October, 2011) for TSP, $PM_{2.5}$ and NO_2; BC Air Quality Objectives (August, 2013) for PM_{10}; and Alberta Ambient Air Quality Guidelines (August, 2013) for dustfall. The Canadian Ambient Air Quality Standards for $PM_{2.5}$ (2015) are also referenced. AWAR transects are sampled to determine effectiveness of dust suppressants, and track changes in generation of road dust.

In total, three of 75 TSP samples on the Meadowbank site exceeded the relevant 24-h GN standard of 120 µg/m^3. The annual average TSP value did not exceed the GN guideline of 60 µg/m^3. No PM_{10} samples exceeded the BC Air Quality Objective of 50 µg/m^3 for the 24-h average. No $PM_{2.5}$ samples exceeded the GN guideline of 30 µg/m^3 or the Canadian Ambient Air Quality Standard of 28 µg/m^3 for the 24-h average.

The Alberta recreational area guideline for dustfall (0.53 mg/cm^2/30 days) was exceeded in 2 of 44 samples on the Meadowbank site. While the applicability of these guidelines is not well defined, there are no recreational or residential users within vicinity of the mine site and exceedance of two samples is not expected to result in significant aesthetic or nuisance concerns. The industrial area guideline (1.58 mg/cm^2/30 d) was not exceeded in any sample.

Dustfall rates along the Meadowbank AWAR continue to lie well within the range of historical values. For samples collected at and beyond the 100 m distance (smallest assumed zone of influence in the FEIS), three of 84 samples collected in 2018 exceeded the Alberta Environment recreational area guideline. Since this guideline is based on aesthetic concerns, it is unlikely that impacts to habitat caused by road dust are occurring beyond FEIS predictions. This conclusion is supported by results of the most recent contaminants monitoring program (Wildlife Screening Level Risk Assessment; Agnico Eagle, 2017) which indicated no incremental risk of the project on wildlife based on road-side soil and vegetation samples.

The GN annual average standard for NO_2 of 32 ppb was not exceeded at either monitoring location on the Meadowbank site.

8.12.3.2 Integration of Monitoring Results

The 2018 AEMP monitoring programs were integrated using the conceptual site model which assists in the evaluation of the transport pathways, provides information on specific media (identifies stressors) and evaluates receptors of concern (effects variables).

As per Azimuth (2012), the results of the monitoring programs were integrated in a mechanistic fashion that required a thorough review of the results to identify any patterns among the relevant receiving water monitoring programs. In cases where exceedances with potential for mine-related impacts to the receiving environment occurred, the potential source, stressor, transport pathways, exposure media, and effects measures were evaluated.

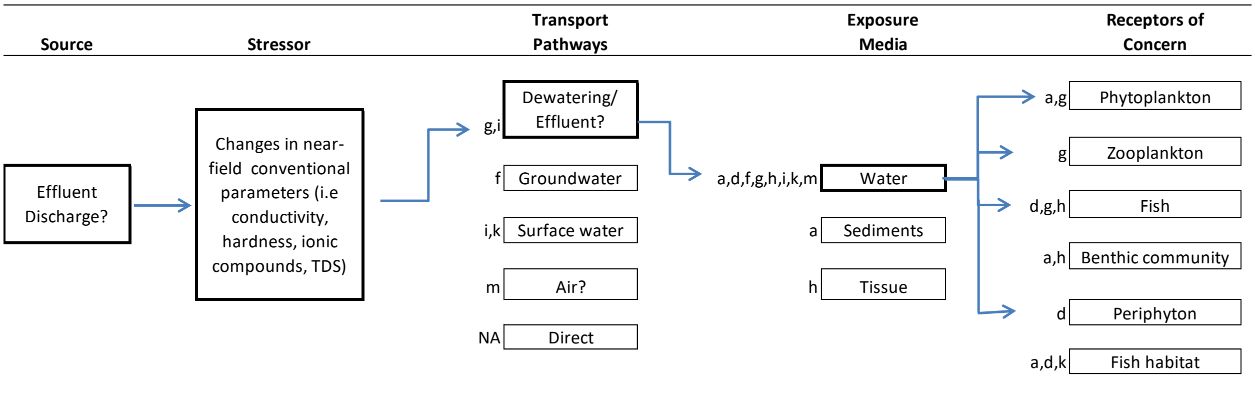
As in previous years, two such situations were further investigated for the Meadowbank site.

1. Mine-related changes in a number of water quality parameters without effects-based thresholds (e.g., CCME water quality criteria) continue to be observed for all near-field lakes.

2. Elevated concentrations of chromium continue to be observed in TPE sediment.

Although most water quality and sediment impacts in near-field lakes (TPN, TPE, SP and WAL) in 2018 were similar to findings in previous years and were considered unlikely to cause any adverse effects to the aquatic community, conceptual site models were developed to assist in linking possible incremental changes in the receiving environment that are evaluated in separate monitoring reports (see Figure 20– evaluation of TDS, conductivity, ionic and nutrient parameters; Figure 21 – evaluation of elevated chromium in TPE sediment).

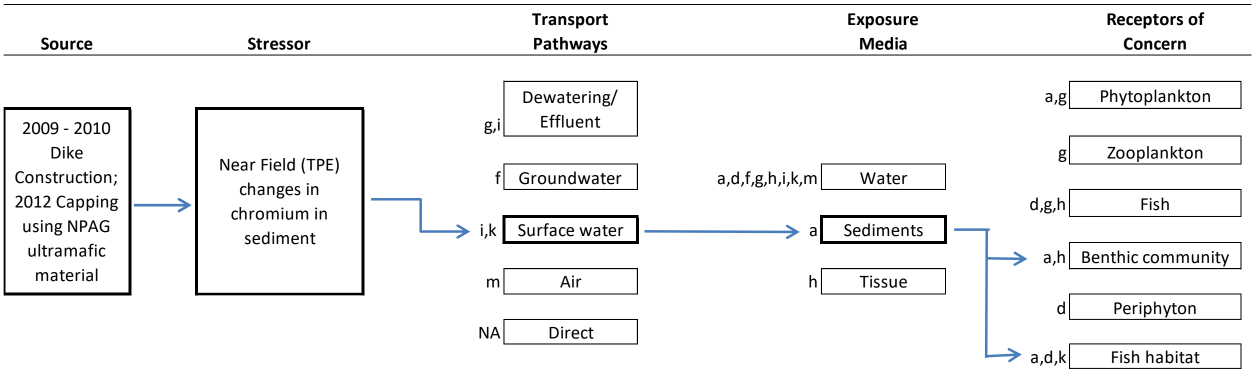
Figure 20. Meadowbank Integrated conceptual site model for 2018 AEMP – Changes in near-field conventional parameters



Notes:

a	Core Receiving Environment Monitoring Program
b	Effects Assessment Studies
c	Dike Construction Monitoring
d	Habitat Compensation Monitoring Program
e	Dewatering Monitoring
f	Groundwater Monitoring
g	MDMER Monitoring
h	EEM Biological Monitoring Studies
i	Water Quality and Flow Monitoring
j	Fish-Out Studies
k	AWPAR and Quarry Water Quality Montoring
l	Blasting
m	Air quality monitoring
NA	Direct, so measured in exposure medium.

Figure 21. Meadowbank Integrated conceptual site model for 2018 AEMP – Elevated chromium in TPE sediment



Notes:

a	Core Receiving Environment Monitoring Program
b	Effects Assessment Studies
c	Dike Construction Monitoring
d	Habitat Compensation Monitoring Program
e	Dewatering Monitoring
f	Groundwater Monitoring
g	MDMER Monitoring
h	EEM Biological Monitoring Studies
i	Water Quality and Flow Monitoring
j	Fish-Out Studies
k	AWPAR and Quarry Water Quality Montoring
l	Blasting
m	Air quality monitoring
NA	Direct, so measured in exposure medium.

8.12.3.3 Identification of Potential Risks and Discussion

8.12.3.3.1 Changes in Conventional Parameters and Major Ions in Meadowbank Site Receiving Surface Waters

In 2018, as reported in the CREMP, statistically significant mine-related changes were detected relative to baseline/reference conditions at one or more near-field (NF) areas for alkalinity (TPE, SP); conductivity (TPN, TPE, SP, WAL); hardness (TPN, TPE, SP, WAL); major cations (i.e., calcium, potassium, magnesium, and sodium [TPN, TPE, SP, WAL]); and TDS (TPN, TPE, SP, WAL). While these results represent mine-related changes, the observed concentrations are still relatively low and there is no evidence to suggest concentrations are increasing year-over-year or that the observed concentrations would result in adverse ecological effects.

Notwithstanding, consideration was taken in the AEMP for all of the potential mine-related sources (effluent release, fugitive dust, and seepage) that may contribute to changes in general water quality parameters. The conceptual site model presented in Figure 20 assists in understanding the possible linkages (i.e., effect to stressor from the source). Based on the monitoring results for 2018, it was determined that the most likely source of changes to conventional parameters is effluent discharge (potentially, current and historical).

The mine-related activities undertaken in 2018 with point-source discharges were effluent discharges to Second Portage (SP) and Wally (WAL). In addition, the Waste Rock seepage event in July 2013 from the Waste Rock Storage Facility which migrated through the perimeter rockfill road at sample station ST-16 into NP-2 Lake was considered a potential source of impacts to NP-2 and ultimately Second Portage Lake. Similarly, seepage from the mill migrating under the Assay Lab road (identified in 2013/2014) could be considered a potential source of impacts to Third Portage Lake. However, based on receiving water quality monitoring in nearshore TPL and NP-2 (Section 8.15.3.1.7), historical seepage events are not considered a significant source of changes to the surface water quality observed in the CREMP.

Based on conceptual models, another potential contributor could be fugitive dust migration. Review of historical air quality monitoring results indicates that rates of dustfall and concentrations of suspended particulates rarely exceed available standards or guidelines at minesite monitoring stations. Therefore it is unlikely that dust generation has been great enough to cause the observed changes in water quality parameters, particularly since all near-field lakes are of relatively large surface area and volume.

Although the observed changes in water chemistry may be a result of effluent discharge, the weight of evidence does not suggest impacts to higher trophic levels:

- All water quality samples collected in 2018 at final discharge points complied with MDMER criteria and water license limits.
- No discharge from the Vault Attenuation Pond to Wally Lake occurred in 2018, and discharge in recent years (2017) was not acutely toxic to fish (rainbow trout) or invertebrates (*Daphnia magna*) (LC50s >100%v/v).
- The most recent (2017) EEM biological results for Wally Lake indicated no impacts to fish populations. Analysis of the benthic community did not indicate a degraded condition relative to the baseline period. Analyses of sub-lethal toxicity samples collected at the Vault final discharge point in 2017 for fish (fathead minnow), invertebrates (*Cerodaphnia dubia*), algae (*Pseudokirchneriella subcapitata*) and macrophytes (*Lemna minor*) were reported to Environment Canada, and results do not require further interpretation (i.e. IC25s >30%v/v).
- CREMP results did not detect significant changes in phytoplankton or benthic invertebrate community metrics in these basins.

Thus, effluent effects on receiving lake water quality, sediment, fish and benthos will continue to be assessed through the scheduled monitoring programs and no adaptive management is recommended in relation to this issue.

8.12.3.3.2 Changes in Chromium in TPE Sediment

The trigger exceedance for chromium in sediment at TPE was identified in 2013 and coring samples in 2014 determined that there was a temporal trend in chromium concentration increases within a localized area of TPE. Although elevated chromium levels have also been found in reference areas of PDL and TPS, the TPE chromium exceedance is likely related to mine activities, more specifically due to Bay-Goose dike capping and construction activity. This may be explained by the fact that ultramafic rock, which is commonly found in the region and was used to construct the Bay-Goose dike, is generally known to contain elevated concentrations of chromium (e.g., on the order of 2000 mg/kg) relative to other rock types (Motzer and Engineers, 2004).

Figure 21 above provides the conceptual site model of impacts due to capping and construction of the Bay-Goose dike. Upon review of the sediment data and historical water quality data, effluent and dust were ruled out from the most likely sources of change, as the effluent discharge point is nearest to TPN, where water quality changes in chromium have not been found. Furthermore, review of the construction monitoring data in the historical CREMP reports indicated elevated chromium in water and sediment.

Sequential extraction tests conducted in 2015 demonstrated that the majority of sediment chromium is sequestered in the non-bioavailable sediment matrix. Furthermore, the fractions that are bioavailable occured at concentrations below effects-based threshold concentrations. This was further demonstrated by toxicity tests conducted on benthic invertebrates; no evidence of contaminant-related effects was noted. In 2016, only sediment grab samples were collected so no formal statistical analysis of data was conducted. Although 2016 grab sample results suggested that concentrations were stabilizing, the full analysis of grab samples and coring completed in 2017 again identified an exceedance of trigger levels, and another full coring and bio-availability study was conducted in 2018. Chromium in sediment cores exceeded the trigger value in 2018, but the concentrations were less than those reported in 2017, and it is suspected that levels are stabilized. The coring study will be repeated in 2019 to provide a complete 3-year trend analysis.

Sediment toxicity tests conducted in 2018 showed significant effects to survival of amphipods, but these were not correlated to measured sediment chromium concentrations. Growth of chironomids was also reduced for TPE sediments compared to field reference sediments, but not compared to laboratory reference sediments. The complete weight-of-evidence assessment determined that currently, concentrations of metals at TPE are not posing risks to the benthic community. That said, there are uncertainties regarding the exact cause of the observed effects to amphipod survival in 2018 that warrant follow-up in 2019. Sediment toxicity tests will be repeated along with pore-water analysis to confirm and if necessary, understand the cause of elevated mortality rates.

HCMP studies which assess fish use of the dike face, periphyton growth, and interstitial water quality, were not required to be conducted in 2018, but may be used in future years to provide a commentary on any localized impacts at higher trophic levels.

8.12.3.4 Recommended Management Actions

Overall, based on the integration of results from the monitoring programs, the AEMP evaluation did not find an apparent excess risk to the aquatic environment due to mine-related activities. However, some threshold or trigger levels were exceeded, likely due to mine-related impacts (especially chromium in TPE sediment) and active follow up with more detailed quantitative assessments are recommended for 2019.

The following management and monitoring actions related to AEMP programs are planned for 2019.

- CREMP
    - Beyond regular CREMP monitoring, recommended management actions for 2019 are to repeat the sediment coring program to verify if the continued increase observed in 2018 in concentrations of chromium at TPE was real or if conditions have stabilized; repeat the sediment toxicity study that was undertaken in 2018, including analysis of pore water.
- MDMER & Water Quality and Flow Monitoring

  - Monitoring will continue as per the monitoring plan, license and MDMER requirements in 2019 if any discharge occurred

- EEM Biological Monitoring Studies
  - No EEM biological monitoring is required for the Meadowbank site in 2019.
- Habitat Compensation Monitoring
  - Monitoring will be conducted in accordance with the HCMP in 2019.
- Dewatering Monitoring
  - No lake dewatering is planned for the Meadowbank site in 2019.
- Fish-out Monitoring
  - No fish outs for the main Meadowbank site are planned for 2019.
- Blast Monitoring
  - No changes are proposed for blast monitoring methods in 2019.
- Groundwater Monitoring
  - A number of recommendations related to new well installation, sampling methods, and analytical parameters are provided in the 2018 Groundwater Monitoring Report for the Meadowbank site (Appendix 37). However, none of these are specifically related to understanding mining impacts on the receiving environment.
- Air Quality Monitoring
  - No specific recommendations for additional management or monitoring actions related to air quality concerns are made for 2019.

8.12.4 Whale Tail Site AEMP

8.12.4.1 Summary of Results of AEMP- Related Monitoring Programs

In 2018, in accordance with the NWB Type A Water Licenses, AEMP-related monitoring programs for the Whale Tail site included:

- the Core Receiving Environment Monitoring Program (CREMP);
- Dike Construction Monitoring
- Groundwater Monitoring.
- Metal and Diamond Mining Effluent Regulation (MDMER) Monitoring;
- Minesite Water Quality and Flow Monitoring;

- Fish-out Studies;
- Visual Whale Tail Haul Road & Quarries Water Quality Monitoring
- Air Quality Monitoring

The results of these monitoring programs are integrated in the AEMP, and assist in the evaluation of potential effects of mining activities on the aquatic environment.

Programs that are components of the AEMP but were not required to be conducted for the Whale Tail Site in 2018 include habitat compensation monitoring, EEM biological studies, blast monitoring and lake dewatering monitoring.

Air quality, the EEM Biological Studies and the Habitat Compensation Monitoring Program (not required to be conducted in 2018) were considered as part of the conceptual site model and are included in the AEMP discussion to inform the process, but these programs are not a requirement of the Type A Water License; Part I-1. Results are summarized and are used as necessary to inform the identification and discussion of potential risks to the receiving aquatic ecosystem.

Summaries of each AEMP monitoring programs are provided below. Figure 8.108 further summarizes the results of these programs in 2018. For detailed results on individual monitoring programs, refer to the appended reports.

Overall, while some additional monitoring activities are recommended for subsequent years, none of the site specific stressors, effects-based triggers or guideline exceedances observed through these programs had the potential to cause significant risks to the aquatic receiving environment requiring immediate changes in management actions.

Table 8.108. Summary of aquatic effect monitoring program results for the Whale Tail site in 2018.

	Core Receiving Environment Monitoring Program	Effects Assessment Studies	Dike Construction Monitoring	Habitat Compensation Monitoring Program	Dewatering Monitoring	MDMER Monitoring	EEM Biological Monitoring Studies	Water Quality and Flow Monitoring	Fish-Out Studies	Visual Whale Tail Haul Road and Quarry Water Quality Monitoring	Blast Monitoring	Groundwater Monitoring
Completed in 2018?	**Yes***	**No**	**Yes**	**No**	**No**	**Yes**	**No**	**No^**	**Yes**	**Yes**	**Yes**	**Yes⁺**
Stressor Variables												
suspended solids	○		○			○			NA	○	NA	NA
sediment deposition	○		NA			NA			NA	○	NA	NA
water-borne toxicants	○		◍			○			NA	NA	NA	NA
sediment toxicants	○		NA			NA			NA	NA	NA	NA
nutrients	○		○			○			NA	NA	NA	NA
other physical stressors	○		○			NA			NA	NA	◍	NA
Effects Variables												
Phytoplankton	○		NA			NA			NA	NA		NA
Zooplankton	NA		NA			NA			NA	NA		NA
Fish	NA		NA			NA			○	NA		NA
Benthic invertebrate community	○		NA			NA			NA	NA		NA
Periphyton	NA		NA			NA			NA	NA		NA
Fish habitat	NA		NA			NA			NA	NA		NA

Notes: *No trigger values have yet been developed. Comparison is to CCME guidelines.

^No monitoring of non-contact water was required for the Whale Tail site in 2018

⁺2018 was considered a baseline year for groundwater monitoring

○ No observed effects

◍ Trigger or guideline exceedance - early warning explained in report

● Observed effects explained in report (applies to effects variables)

8.12.4.1.1 Whale Tail CREMP

Baseline data collection continued for most of the study area lakes in 2018. With the onset of in-water construction activities in Whale Tail Lake, Whale Tail Lake -South Basin (WTS) and Mammoth Lake (MAM) transitioned from control to impact designations in late July and November, respectively. A statistical approach to comparing potential changes at WTS was considered unnecessary for assessing changes in 2018 and supporting management decisions in 2019. Given the limited amount of data in the "after" period and the absence of site-specific triggers and thresholds, this year's assessment of spatial and temporal trends focused on visual identification of construction-related changes (i.e., emphasis on WTS and MAM relative to the rest of the areas). Future assessments will follow the same process used for Meadowbank (i.e., use of triggers/thresholds and formal statistical testing of trends).

Water Quality

CREMP trigger values have not yet been developed for the Whale Tail area. No CCME guideline values were exceeded. For parameters without effects-based thresholds (e.g. some major ions and conventional parameters), some predictable changes in water quality were observed in WTS and MAM. Effects of construction activities were generally observed as a slight increase in TSS and related parameters in WTS for the period of August to November, and an increase in conductivity in the eastern end of Mammoth Lake beginning in November. For the eastern basin of Mammoth Lake, hardness, TDS, nutrients (e.g., nitrate and phosphorus), and some metals (e.g., total and dissolved aluminum, total chromium, and total iron) were measured at higher concentrations compared to earlier in the year and compared to baseline November events in 2016 and 2017. However similar to WTS, there were no measured exceedances of the CCME water quality guidelines for parameters with effects-based thresholds.

The available data from 2018 show the spatial extent of the construction related changes in water quality did not extend downstream from MAM to Lake A76. NEM, A20 and Lake DS1 were similarly kept in the "control" phase for the duration of 2018.

Sediment

There was no indication of a temporal increase in sediment metals concentrations at WTS (or any other area) in 2018 relative to the baseline period.

Phytoplankton and Invertebrate Communities

Overall there was no evidence to suggest site-related activities caused changes in primary productivity or benthic communities in the near-field areas (MAM and WTS) due to construction activities in 2018.

Table 8.109. Summary of 2018 CREMP results for the Whale Tail site (Appendix 31: 2018 CREMP Report, Table ES-2). Figure/Table/Section referenced in this Table are the one from the Appendix 31.

Monitoring Component (and report section)	**Variable**	**Summary**	**Temporal and Spatial Trend Assessment**[1]
Limnology Section 5.2	Oxygen and Temperature	The limnology profiles collected in 2018 show dissolved oxygen and temperature readings are consistent with range of conditions observed in previous monitoring cycles (2015 to 2017).	See the Summary text (over)
	Conductivity	Specific conductivity measurements were low and within the range of normal conditions defined as < 75 µS/cm for measurements collected from the NF, MF, and FF study areas in 2018. **WTS** – The onset of dike construction in Whale Tail Lake did not result in changes in specific conductivity at WTS. Profiles taken at WTS in July and August were virtually identical, measuring 35 µS/cm and 38 µS/cm in August and September **MAM** – There was some evidence of seasonal changes in water quality at MAM based on the late-season conductivity profile data collected in November and December compared to the other sampling events.	**Spatial scale – localized**; increasing conductivity readings were isolated to the NE corner of MAM in November and December (100-175 µS/cm). The second profile collected in November at the opposite end of the lake and away from construction activities was similar to baseline (70-80 µS/cm). **Temporal trend – increasing**; two consecutive months of increasing conductivity readings in MAM indicated a temporal change may be occurring. Monitoring in 2019 is scheduled to verify the trend. **Causality – moderate;** the timing of the increase in conductivity matches construction activities near MAM, but ice cover precludes dust or runoff as likely causes. Ongoing monitoring in 2019.

Monitoring Component (and report section)	**Variable**	**Summary**	**Temporal and Spatial Trend Assessment**[1]
Water Chemistry Section 5.3	TSS	There were some predictable increases in water quality parameters measured in surface water samples from the south basin of Whale Tail coinciding with dike construction. TSS measured 2 mg/L in August.	**Spatial scale – localized**; elevated TSS was limited to WTS; concentrations at MAM were <DL in all 5 sampling events. There was no indication of changes in water quality in 2018 relative to baseline conditions at NEM, A20, or the areas downstream from WTS and MAM (A76 and DS1). **Temporal trend – sporadic;** TSS peaked in August at WTS but by November concentrations were representative of baseline conditions. **Causality – high;** dike construction was responsible for the observed increase, but the mine was in full compliance with TSS monitoring limits in 2018, indicating the silt curtains were effective in maintaining low sedimentation.
	Conventional Parameters, Major Cations, and Nutrients	The study lakes are headwater lakes, so there are no significant natural sources of nutrients or sediment introduced to these lakes, save only local runoff that contributes little nutrient enrichment, but sustains these aquatic ecosystems. Based on total phosphorus, the lakes are ultra-oligotrophic (< 0.004 mg/L; CCME, 2004). **WTS** –concentrations of some nutrients and major cations increased with TSS in August, but were trending lower as TSS returned to baseline concentrations in November. **MAM** – hardness, chloride, nitrate, nitrite, and phosphorus were trending higher in 2018.	**Spatial scale – localized**; limited to WTS and MAM in 2018. For some parameters, there is considerable within-lake variability, indicating the lakes were not well mixed in the months after construction started (see November nitrate results in **Figure 5-16** as an example of within-area variability at MAM). **Temporal trend – sporadic (WTS); increasing (MAM)**; concentrations measured in WTS were only transiently elevated; by November most parameters had returned to baseline. At MAM, concentrations of some conventional parameters (e.g., hardness) and nutrients (e.g., nitrate and phosphorus) were trending higher in September and November relative to baseline conditions. **Causality – high;** construction activities are the likely cause of the observed increase in concentration in the latter half of 2018. Follow-up monitoring is planned for 2019.
Water Chemistry Section 5.3	Metals (total and dissolved)	Reported results from 2018 shown good water quality at all six lakes in 2018 in spite of major in-water construction activities in Whale Tail Lake. No exceedances of the CCME water quality guidelines were reported for metals in WTS or MAM. There were increases in some metal relative to baseline conditions in 2018: **WTS** – Parameters that were elevated due to higher TSS (2 mg/L) in August were total (unfiltered) aluminum iron, chromium and to a lesser magnitude arsenic, copper, and lead. **MAM** – Metals such as aluminum, chromium, lead, and zinc were trending higher in the November sampling event compared to baseline conditions in 2014 through 2017.	Spatial and temporal trends described above for WTS and MAM conventional parameters and nutrients broadly applies to metals in two lakes. Monitoring is scheduled at the NF, MF, and FF in 2019 to monitor spatial and temporal trends in metals concentrations among the study areas.
Phytoplankton Section 5.4	Chlorophyll-a	Chlorophyll-a concentrations were typically less than 1 µg/L. indicative of oligotrophic systems (Kasprzak et al. 2008) and representative of baseline trophic status in the various lakes.	The limited data set for the 'after' period at WTS (August, September and November) and MAM (November) meant there was limited value in formally assessing (i.e., statistical BACI analyses) potential changes in biomass and species richness this year. Key points are: - The 2018 phytoplankton community metrics are representative of conditions measured in the baseline period. - Phytoplankton sampling is scheduled at the NF, MF, and FF in 2019 to monitor spatial and temporal trends in primary productivity and community composition.
	Total Biomass	Total biomass was highest for the July 8th sampling event with ~400 mg/m^3 at measured in WTS and ~350 mg/m^3 and MAM. These data are at the upper end of the range reported in the 2015 to 2017 baseline data.	
	Taxa Richness	The pattern of seasonal variability in species richness observed in 2018 at WTS and MAM was similar to the baseline period. At WTS, the richness in August and September ranged from 27 to 31. By comparison, the 2017 results for August were 33 and 34 taxa.	

Monitoring Component (and report section)	**Variable**	**Summary**	**Temporal and Spatial Trend Assessment**[1]
Sediment Chemistry Section 5.5	Metals	Sediment grab sampling was completed for metals and analysis and supporting habitat variables in 2018. Sampling was also completed at MAM and WTN (north basin of Whale Tail) for laboratory sediment toxicity tests with *C. dilutus* and *H. azteca* to characterize baseline conditions (i.e., survival and growth) prior to development and potential increases in sediment metals. MAM and WTN vary widely in concentrations of arsenic, providing an opportunity to assess organism responses to different concentrations. Lakes within the Whale Tail study area enriched in some metals compared to CCME sediment quality guidelines (SQGs). Arsenic, cadmium, chromium, copper, and zinc exceeded the interim sediment quality guideline (ISQG) in at least one sample collected in 2018.	Formal statistical analysis of changes in sediment chemistry are done on a 3-year cycle in years when sediment coring (and EEM) is completed. Baseline coring data were collected in 2017 and the first cycle of before-after (BA) statistical analysis is scheduled for the 2020 CREMP. Some key points regarding sediment chemistry at Whale Tail are: - Arsenic is particularly enriched in sediments throughout the study area. Concentrations measured in 2018 exceeded the ISQG in 100% of samples and exceeded the PEL in 25/30 samples. Chromium is also naturally elevated throughout the study area. - There is considerable within-area variability in sediment metals concentrations reported on an annual basis. - No effect on *C. dilutus* and *H. azteca* survival or growth in MAM and WTN relative to lab or field controls (INUG and PDL sediments). Arsenic concentrations in sediment from WTN were > 40-fold higher than the sediment quality guidelines (CCME) with no observed effect.
	Organics (PAHs)	Hydrocarbon concentrations were less than the detection limits for all analytes measured in the composite samples from 2018.	PAHs, LEPHs, and HEPHs are not considered contaminants of potential concern; annual monitoring is completed as per the study design.
Benthos Section 5.6	Total Abundance	Benthic invertebrate communities at the NF, MF, and FF areas were monitored in 2018. Representative baseline benthos data is available at NF areas (WTS, MAM, and NEM) since 2015. MF and FF sampling at A20, A76, and DS1 was implemented in 2016. Insects are the dominant taxa group in terms of abundance at the Whale Tail study area lakes.	The timing of 2018 sampling (August) relative to timing and extent of dike construction (late July) meant WTS transitioned from the 'before' period to the 'after' period in 2018. The other NF, MF, and FF areas remained in 'before' or baseline status in 2018. Formal BACI analysis of the benthos data was deferred until 2019 because of the short window of time between the onset of construction and the timing of the benthos sampling in mid-August. Plots of the key metrics (i.e., abundance and richness) were used to assess spatial and temporal trends for the Whale Tail study area lakes (**Figure 5 51** to **Figure 5 56**). Key observations about the benthos community are: - The normal range in mean total abundance across years among the 6 study areas is roughly 2,000 to 5,000 organisms/m^2. - Total benthos abundance is highly variable within the lakes and among years. For example, estimated total abundance in two replicates from A76 in 2017 were 14,000 and 24,000 organisms/m^2 compared to approximately 3,000 organisms/m^2 in the other three replicates. - Taxa richness was less variable within and among areas on an annual and inter-annual basis (**Figure 5 54**). - Taxa richness at WTS was highest in 2018 (13 to 20 taxa) compared to richness measured during the baseline period.
	Total Richness	Insects are the dominant taxa group in terms of richness Molluscs are the next most dominant taxa group in terms of the number species, particularly when the abundance of insects and other taxa groups are low (Azimuth 2018a).	

8.12.4.1.2 Whale Tail Dike Construction Monitoring

In 2018, construction of the Whale Tail Dike began. Neither construction of the Mammoth Dike nor lake dewatering activities occurred in 2018. TSS (total suspended solids) and turbidity (primarily as a surrogate for TSS) are the major drivers of management actions during construction and dewatering.

In-water construction of the Whale Tail Dike occurred from July 27 – August 27, 2018. Prior to dike construction, three turbidity curtains were installed on the south side of the dike. As a supplementary measure to protect fish remaining in the Whale Tail North Basin during the fishout, two turbidity curtains were also deployed prior to the start of the construction on the north side of the dike. Southern turbidity curtains were removed in September, after in-water construction was complete. A full list of mitigation measures to control release of TSS are described in Section 2.1.1 of the Water Quality Monitoring for Dike Construction and Dewatering report.

Results of water quality monitoring during dike construction are compared to NWB Type A Water License criteria for TSS/turbidity. Monitoring occurred in four locations; north and south of turbidity curtains, as well as broad survey locations in Whale Tail Lake (South Basin) and Mammoth Lake. Four separate turbidity depth profiles were recorded using a handheld meter at each location, and turbidity values were converted to TSS using a site-specific, DFO-approved regression equation.

All monitoring results for all stations were within NWB Water License criteria, so no supplemental management actions were required to be implemented. For broad survey locations (Whale Tail Lake South Basin and Mammoth Lake), calculated TSS concentrations were at or very near measured baseline levels.

Complete water quality analyses were conducted weekly, as feasible, at dike construction monitoring locations. For total metals, one or more samples exceeded CCME guidelines for several parameters at each station. Parameters exceeding the guidelines for total metals were: iron, lead and selenium (WT-DC location) and aluminum, copper, chromium, iron, lead, selenium, thallium, and zinc (WTN-DC location). While no guidelines were available for any dissolved metal except aluminum, results of the dissolved metals analysis were compared to guidelines for total metals, as in the Bay-Goose Dike construction monitoring report (Azimuth, 2010). Dissolved metals only exceeded those guidelines for three samples: chromium was marginally above the guideline in one sample at WTN-DC, and selenium marginally exceeded the guideline twice in this location. This pattern of results is similar to those observed for the Bay-Goose Dike construction (Azimuth, 2010), and East Dike construction (Azimuth, 2009). Dissolved metals are considered a much better indicator of potential effects to aquatic life in the water column, and therefore as concluded in Azimuth (2010), these water quality results suggest that direct toxic effects to aquatic life are unlikely. CREMP results confirm no impacts to the receiving environment water quality occurred.

8.12.4.1.3 Whale Tail Groundwater Monitoring

For the Whale Tail site, groundwater monitoring in 2018 continued in the baseline phase.

8.12.4.1.4 Whale Tail Site Non-Contact Water and Effluent Monitoring

This section includes discussion of results from water quality monitoring under MDMER or the Water Quality and Flow Monitoring Plan for managed non-contact water or water discharged to the receiving environment.

In 2018, effluent was discharged related to Whale Tail dike construction. No exceedance of the MDMER/NWB Water License criteria occurred.

No non-contact water diversion ditches were constructed and no other non-contact water was required to be sampled for the Whale Tail site in 2018.

8.12.4.1.5 Whale Tail Fish-out Studies

The fishout of Whale Tail Lake (North Basin) took place from August 13 – September 27, 2018, and followed protocols developed in the Conceptual Whale Tail Lake (North Basin) Fishout Work Plan (February, 2017) in consultation with the retained fisheries consultant (North/South Consultants Ltd.) and Fisheries and Oceans Canada (DFO). With all effort combined, a total of 3,078 fish weighing 776 kg and consisting of four species (Arctic char, burbot, lake trout and round whitefish) were captured. Of these, 2429 fish (79%) were successfully transferred to Whale Tail Lake (South Basin). Fish were generally determined to be in good health, with average condition factors >1 for all species. Agnico was in regular contact with DFO throughout the fish-out period and all results have been provided.

8.12.4.1.6 Whale Tail Haul Road and Quarries Water Quality Monitoring

Pre-freshet and freshet inspections were conducted at crossings along the Whale Tail Haul Road in 2018. These inspections are conducted to document the presence/absence of flow, erosional concerns and turbidity plumes. No erosional concerns or visual turbidity plumes were observed during the freshet inspections. Weekly inspections are also conducted on a year round basis. No visual turbidity plumes or erosion was observed.

Regular inspections of quarries along the Whale Tail Haul Road were also performed during the year to ensure that runoff, if any, would be free of any visible sheen and would not impact the environment. No issues with runoff water inside the quarries were noted in 2018.

8.12.4.1.7 Whale Tail Blast Monitoring

In 2018, blast monitoring at the closest fish-bearing waterbody was conducted for construction activities at the Whale Tail site. Three blast stations were monitored (Whale Tail 1, Whale Tail 2, Mammoth 1). Two peak particle velocity (PPV) measurements exceeded the DFO limit of 13 mm/s at the Whale Tail site. IPC measurements were all below the DFO limit of 50 kpa. The two PPV exceedances were during the period of egg incubation (August 15 to June 30). The first exceedance (16.8 mm/s) was recorded at Whale Tail Station #1 with on March 22nd. For this blast, nine (9) preshear holes were detonated on the same delay, which isn't significantly higher than what was previously done at Whale Tail and Meadowbank for 14m holes. To mitigate the probability of another exceedance for preshear holes, mitigation technique number four from the Blast Monitoring Plan was used. This technique is to reduce the explosives quantity per delay. Since this event, no exceedances were observed for preshear holes. The second exceedance (26.1 mm/s) was recorded at Whale Tail Station #1 on April 30th. This blast was for Attenuation Pond 5 where previous blasts were not yielding enough movement. In order to remediate this, delays between rows were shortened from 176ms to 66ms. This technique was determine to be a viable solution to this problem and since then no exceedances were recorded for production blasts.

8.12.4.1.8 Whale Tail Air Quality Monitoring

The objective of this program is to measure dustfall, NO_2, and/or suspended particulates (TSP, PM_{10}, $PM_{2.5}$) at various monitoring locations around the Meadowbank and Whale Tail sites, Meadowbank All-Weather Access Road (AWAR), and Whale Tail Haul Road (WTHR). Results obtained for the measured parameters are compared to Government of Nunavut (GN) Environmental Guidelines for Ambient Air Quality (October, 2011) for TSP, $PM_{2.5}$ and NO_2; BC Air Quality Objectives (August, 2013) for PM_{10}; and Alberta Ambient Air Quality Guidelines (August, 2013) for dustfall. The Canadian Ambient Air Quality Standards for $PM_{2.5}$ (2015) are also referenced. WTHR transects are sampled to verify predictions made in the Environmental Impact Statement for that project (Golder, 2016).

Suspended particulates, dustfall, and NO_2 were not monitored for the Whale Tail site in 2018.

All samples for dustfall collected along the WTHR were within FEIS predictions with the exception of one 25-m sample at km 37. Given the high variability observed in dustfall samples, particularly in locations close to the road, this isolated event is not expected to result in impacts greater than predicted overall. However, data will continue to be reviewed in subsequent years to determine whether a trend towards elevated dustfall rates is occurring. The more general FEIS prediction that the Alberta Environment guideline for recreational areas would not be exceeded beyond 300 m of the road was met in all cases.

8.12.4.2 Integration of Monitoring Results

The 2018 AEMP monitoring programs were integrated using the conceptual site model which assists in the evaluation of the transport pathways, provides information on specific media (identifies stressors) and evaluates receptors of concern (effects variables).

As per Azimuth (2012), the results of the monitoring programs were integrated in a mechanistic fashion that required a thorough review of the results to identify any patterns among the relevant receiving water monitoring programs. In cases where exceedances of limits, guidelines, or triggers with potential for mine-related impacts to the receiving environment occurred, the potential source, stressor, transport pathways, exposure media, and effects measures were evaluated.

Since limited construction-phase monitoring occurred for the Whale Tail site in 2018, no exceedance situations were investigated further through the AEMP. While some minor exceedances of CCME guidelines occurred for the impounded area of Whale Tail Lake – North Basin in two sampling events during dike construction, and evidence of construction activities was observed further downstream in the eastern-most basin of Mammoth Lake through an upward trend in conductivity, there were no measured exceedances of the CCME water quality guidelines in the receiving environment, indicating these conditions are unlikely to adversely affect aquatic life. Trends will continue to be monitored in 2019.

In addition, two blasts exceeded PPV guidelines, however mitigation was implemented immediately according to the Blast Mitigation Plan, and no further exceedances have occurred for each blast type.

Trends for both of these potential stressors will continue to be monitored in 2019.

8.12.4.3 Recommended Management Actions

No supplemental management actions are planned in 2019 for the Whale Tail site.

The following regular actions related to AEMP programs will occur.

- CREMP
  - Monitoring will continue in 2019 along with the development of site-specific trigger values and full BACI statistical comparison for 2019 monitoring results.
- Dike Construction Monitoring
  - Monitoring for Mammoth Dike construction will continue in accordance with the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering (January 2017).
- MDMER & Water Quality and Flow Monitoring
  - Monitoring will continue as per the monitoring plan, license and MDMER requirements in 2019
- EEM Biological Monitoring Studies
  - Cycle 1 EEM Biological Monitoring study will be conducted for Whale Tail in 2020.
- Habitat Compensation/Offset Monitoring
  - No physical habitat offset monitoring is required for the Whale Tail site in 2019.
- Dewatering Monitoring
  - Whale Tail Lake (North Basin) will be dewatered in 2019, and monitoring will be conducted in accordance to license requirements and the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering (January 2017).
- Fish-out Monitoring
  - N/A – No fish outs are planned for 2019.
- Blast Monitoring
  - Blast monitoring will continue in accordance with the Blast Monitoring Program (updated March, 2019).
- Groundwater Monitoring
  - Monitoring will continue in accordance with the Groundwater Monitoring Plan (2019).
- Air Quality Monitoring
  - Monitoring will continue in accordance with the Air Quality and Dustfall Monitoring Plan (March, 2019).

8.13 NOISE MONITORING

8.13.1 Meadowbank Site

As required by NIRB Project Certificate No.004 Condition 62: *Develop and implement a noise abatement plan to protect wildlife from significant mine activity noise, including blasting, drilling, equipment, vehicles and aircraft; sound meters are to be set up immediately upon issuance of the Project Certificate for the purpose of obtaining baseline data, and monitoring during and after operations.*

The 2018 noise monitoring program at Meadowbank was conducted according to the Noise Monitoring and Abatement Plan (Version 3; 2018). The objective of this program is to measure noise levels at five (4) previously determined monitoring locations around the Meadowbank site, over at least two 24 h periods. Since high winds in the area tend to substantially reduce the quantity of available valid data, Agnico aims to conduct a minimum of two monitoring rounds of two to four days per station. Daytime, night-time, 10-11pm, and 24 h Leq values calculated from recorded 1-min Leq values for each monitoring event and location are shown in Table 8.110. All sites are located at a distance from noise sources to be representative of sound levels in locations where wildlife may be expected to occur, and where noise-related PPE is not required. The measured levels provide a snapshot of the acoustic environment in this phase of project and are considered representative of the current operational activity. Please refer to Appendix 44 – 2018 Noise Monitoring Report for a complete review of the 2018 results.

The daytime target sound level (55 dBA) and nighttime target sound level (45 dBA) were exceeded during one monitoring event at R4 (July 2 – 5). An examination of the data indicated that sound levels were consistent throughout the monitoring period, and not due to isolated peaks. No specific noise sources could be identified through recordings. However, the elevated noise levels were not sustained, as targets were not exceeded during the second monitoring event (July 23 – 25), and Leq values were within the range of those observed historically site-wide. Therefore overall, onsite sound levels do not appear to be increasing.

Historical comparison were done for Leq measurements for all valid time periods from 2009 - 2018 at monitoring stations R1 – R5. For all sites except R4, measurements were well within or below the range of historical value. Sound levels during the first monitoring event at R4 (July 2 – 5) were elevated compared to previous years, and exceeded target sound levels for the first time. However, R4 Leq values were within the range of those observed historically site-wide, and were not elevated during the second monitoring event. Therefore overall, onsite sound levels do not appear to be increasing.

A comparison to FEIS predictions was performed, and all measured values were within predictions, with the exception of one hourly datapoint for R5. However, the exceedance was less than 3 dBA (i.e. not audibly different), and design target sound levels were met for this site. Refer to Section 4.3 of the 2018 Noise Report for more information (Appendix 44). The current monitoring program provides a conservative assessment of the accuracy of predicted noise levels.

In relation to the FEIS, noise monitoring results were assessed to be conservative in comparison.

Results are also compared annually to the accuracy of predicted impacts in the annual report.

Impacts of sensory disturbance on wildlife are determined through the Terrestrial Ecosystem Monitoring Plan (TEMP), and reported annually in the Wildlife Summary Report (Appendix 45). While sensory disturbance of caribou in excess of impact predictions was identified in that report in 2018, the contribution of noise to sensory disturbance cannot realistically be isolated. However, supplemental monitoring under the recently updated TEMP (December, 2018) will specifically aim to quantify the response of caribou to blasts in 2019.

Noise monitoring will continue in 2019.

Table 8.110. Daytime, night-time, 10-11 pm, and 24-h Leq values for monitoring locations R1 – R5, and number of hours for the corresponding time period for which valid data was available (# hours). Day- and night-time periods with fewer than 3 hours of valid data are excluded (-), and those exceeding corresponding target sound levels are shaded grey. Noise levels at R6 were not assessed in 2018.

Site	Dates (2018)	Leq, day 7am-11pm (dBA)	# hours	Leq, night 11pm-7am (dBA)	# hours	Leq, 1 h 10-11pm (dBA)	Leq, 24 h (dBA)	# hours
R1	Jun 27 - 29	37.7	13	36.0	8	-	37.2	21
	Jul 18 - 20	45.2	14	38.0	10	29.9	43.4	24
R2	Jun 29 - Jul 2	42.0	32	35.1	13	38.0	40.7	45
	Jul 23 - 25	36.3	7	38.3	10	-	37.5	17
R3	Jul 9 - 12	36.2	26	41.6	19	37.8	38.8	45
R4	Jul 2 - 5	58.9	20	48.5	16	55.1	57.3	36
	Jul 25 - 27	34.8	16	39.8	6	33.3	36.7	22
R5	Jul 5 - 7	-	0	26.1	4	0.0	26.1	4
	Jul 16 - 18	49.5	10	31.4	8	29.2	47.0	18

8.13.2 Whale Tail Site

As required by NIRB Project Certificate No.008 Condition 5: ***Result of all noise monitoring undertaken by the Proponent shall be provided to the Nunavut Impact Review Board on an annual basis. The Proponent shall:***

> ***a) Conduct noise monitoring at least once during each phase of the Project at four (4) locations in the vicinity of the Whale Tail Pit Project and at two (2) locations along the haul road to demonstrate that noise levels remain within predicted levels for all Project areas; and***
>
> ***b) If monitoring identifies an exceedance, the Proponent shall provide an explanation for the exceedance, a description of planned mitigation, and shall conduct additional monitoring to evaluate the effectiveness of mitigative measures.***

The 2018 noise monitoring program at Whale Tail was conducted according to the Noise Monitoring and Abatement Plan (Version 3; 2018). The objective of this program is to measure noise levels at six (6) previously determined monitoring locations around the Whale Tail site, over at least two 24 h periods. Monitoring station R6 and R7 are along the Whale Tail Haul Road and stations R8 to R11 are around the Whale Tail Pit Project. Refer to Figure 2 and Section 1.1 of the 2018 Noise Report (Appendix 44) for more details regarding monitoring station locations. Since high winds in the area tend to substantially reduce the quantity of available valid data, Agnico aims to conduct a minimum of two monitoring rounds of two to four days per station. In 2018, construction at the Whale Tail site began mid-way through the summer season, so one survey was planned for those noise stations (R6 – R11) in this first monitoring year. Monitoring was not conducted at R6 in 2018 due to scheduling difficulties. This station will be monitored in 2019.

Daytime, night-time, 10-11pm, and 24 h Leq values calculated from recorded 1-min Leq values for each monitoring event and location are shown in Table 8.111. Please refer to Appendix 44 – 2018 Noise Monitoring Report for a complete review of the 2018 results.

There were no were exceeded in 2018 to daytime and nighttime sound level.

A historical comparison will begin in 2019 for R6 – R11 after two years of monitoring have occurred.

A comparison to FEIS predictions was performed, and all measured values were within predictions. Refer to Section 4.3 of the 2018 Noise Report for more information (Appendix 44).

Noise monitoring will continue in 2019.

Table 8.111. Daytime, night-time, 10-11 pm, and 24-h Leq values for monitoring locations R6 – R11, and number of hours for the corresponding time period for which valid data was available (# hours). Day- and night-time periods with fewer than 3 hours of valid data are excluded (-), and those exceeding corresponding target sound levels are shaded grey. Noise levels at R6 were not assessed in 2018.

Site	Dates (2018)	$L_{eq, day}$ 7am-11pm (dBA)	# hours	$L_{eq, night}$ 11pm-7am (dBA)	# hours	$L_{eq, 1 h}$ 10-11pm (dBA)	$L_{eq, 24 h}$ (dBA)	# hours
R6	-	-	-	-	-	-	-	-
R7	Aug 25 - Sept 2	28.8	39	31.1	19	31.8	29.7	58
R8	Jul 30 - Aug 2	-	2	32.8	9	28.9	35.4	11
R9	Aug 3 - 7	40.2	10	39.0	8	24.9	39.7	18
R10	Sept 16 - 19	33.9	3	-	2	30.7	34.4	5
R11	Aug 13	43.2	10	-	0	46.4	43.2	10

8.14 AIR QUALITY MONITORING

8.14.1 Meadowbank Site

As required by NIRB Project Certificate No.004 Condition 71*: In consultation with EC, install and fund an atmospheric monitoring station to focus on particulates of concern generated at the mine site. The results of air-quality monitoring are to be reported annually to NIRB.*

And

As required by NIRB Project Certificate No.004 Condition 74*: shall employ environmentally protective method to suppress any surface road dust.*

8.14.1.1 Air Quality and Dustfall Monitoring Mine Site

The Air Quality and Dustfall Monitoring Plan was updated in March 2019 (version 4) and is submitted a part of the 2018 Annual Report. The update was to address concerns raise by ECCC in the letter '03MN107/16MN056 – Agnico Eagle Mines Ltd. – Meadowbank Gold Project and Whale Tail Project – 2017-2018 Annual Monitoring Report ECCC, Responses to NIRB Recommendations'.

The 2018 air quality and dustfall monitoring program at Meadowbank was conducted according to the Air Quality and Dustfall Monitoring Plan - Version 3 (May, 2018). Below is a summary of the results obtained in 2018. Agnico will refer the reader to the Air Quality and Dust Monitoring Report (Appendix 39) for a complete review and interpretation of the results.

The objective of the 2018 program was to measure dustfall, NO_2, and/or suspended particulates (TSP, PM_{10}, $PM_{2.5}$) at four monitoring locations around the Meadowbank site. Locations were established in 2011 in consultation with Environment and Climate Change Canada.

ASTM methods suggest collection of the dustfall sample at 2-3 m height on a utility pole to prevent reentrainment of particulates from the ground, and to reduce vandalism and potential for wildlife interaction. For locations DF-1 – DF4, samples were collected in this manner.

In total, 3 of 75 TSP samples on the Meadowbank site exceeded the relevant 24-h GN standard of 120 μg/m3. The annual average TSP value did not exceed the GN guideline of 60 μg/m3. No PM_{10} samples exceeded the BC Air Quality Objective of 50 μg/m^3 for the 24-h average. No PM2.5 samples exceeded the GN guideline of 30 μg/m^3 or the Canadian Ambient Air Quality Standard of 28 μg/m^3 for the 24-h average.

The Alberta recreational area guideline for dustfall (0.53 mg/cm^2/30 days) was exceeded in 2 of 44 samples on the Meadowbank site. While the applicability of these guidelines is not well defined, there are no recreational or residential users within vicinity of the minesite and exceedance of two samples is not expected to result in significant aesthetic or nuisance concerns. The industrial area guideline (1.58 mg/cm^2/30 d) was not exceeded in any sample. Relatively low dustfall values overall may reflect continued efforts to manage dust on site roads through use of dust suppressants (calcium chloride application) and water trucks.

The GN annual average standard for NO_2 of 32 ppb was not exceeded at either monitoring location on the Meadowbank site.

Historical comparisons indicate no trends towards increasing concentrations of any measured air quality parameter. Refer to Section 5 of the 2018 Air Quality and Dust Monitoring Report.

For comparison of 2018 results to the FEIS, refer to Section 12.4.2 below.

Estimated greenhouse gas emissions for the Meadowbank site as reported to ECCC's Greenhouse Gas Emissions Reporting Program in 2018 were 186,122 tonnes CO_2 equivalent, which is similar to the value obtained in 2015, 2016 and 2017 (187,280, 184,223 and 194 440 tonnes CO_2 equivalent).

Following the incinerator stack testing result, the measured concentrations of mercury were below the GN standard of 20 μg/Rm^3 in all three tests. Measured concentrations of total dioxins and furans were also below the GN standard (80 pg TEQ / Rm^3 @ 11 % v/v O_2) in all three tests. Refer to Section 6.2.1.1 above for more details regarding the 2018 stack testing.

Overall, there are no apparent trends towards increasing air quality concerns at the Meadowbank site.

8.14.1.2 AWAR Dustfall Monitoring

In response to community concerns of dust generation, Agnico Eagle has conducted studies of dustfall along the Meadowbank AWAR since 2012. These studies characterize dust deposition rates to help determine the potential for impacts to wildlife in excess of those predicted in the Final Environmental Impact Statement (FEIS).

Below is a summary of the results obtained in 2018. Agnico will refer the reader to the Air Quality and Dust Monitoring Report (Appendix 39) for a complete review and interpretation of the results.

The objectives of the study conducted in 2018 was to continue monitoring to confirm results of the 2016-2017 study and observe changes in dustfall rates in areas with and without dust suppression.

As in previous years, dustfall samples were collected in open vessels containing a purified liquid matrix provided by an accredited laboratory (Maxxam Analytics). Particles are deposited and retained in the liquid, which is then filtered to remove large particles (e.g. leaves, twigs) and analyzed by the accredited laboratory for total and fixed (non-combustible) dustfall.

ASTM methods suggest collection of the dustfall sample at 2-3 m height on a utility pole to prevent reentrainment of particulates from the ground, and to reduce vandalism and potential for wildlife interaction. However, due to the difficulty of constructing and deploying stands to hold the large number of sample containers used for road-side dustfall sampling, and the remote locations, the 2012 study compared dustfall at ground level and at 2 m height to inform future sampling method decisions. Based on those results and the assumption that any re-entrainment would result in conservatively high estimates of dustfall, all roadside sampling canisters have been deployed at ground level since 2013. Following concern raised by ECCC, Agnico will conduct a supplemental study in 2019 to confirm that dustfall rates measured at ground level continue to align with those measured on stands.

In 2018, the dustfall sampling program was to assess dustfall rates in five AWAR dust suppression locations (km 11, 25, 50, 69, 80), as well as at two reference sites without dust suppression (km 18 and 78) that have been monitored since 2012.

On July 9, dust suppressant (Tetraflake (calcium chloride)) was applied to five sections of the AWAR (Km 10-12, Km 24-26, KM 48-50, Km 68-70 and Km 80-84).

Dustfall rates along the Meadowbank AWAR continue to lie well within the range of historical values. For samples collected at and beyond the 100 m distance (smallest assumed zone of influence in the FEIS), three of 84 samples collected in 2018 exceeded the Alberta Environment recreational area guideline. Since this guideline is based on aesthetic concerns, it is unlikely that impacts to habitat caused by road dust are occurring beyond FEIS predictions. This conclusion is supported by results of the most recent contaminants monitoring program (Wildlife Screening Level Risk Assessment; Agnico Eagle, 2017) which indicated no incremental risk of the project on wildlife based on road-side soil and vegetation samples.

In addition, Agnico Eagle applied dust suppressant in two locations near the hamlet (Agnico spud barge and fuel tank farm) as well as over 7 km of AWAR on the Meadowbank site. In 2019, Agnico plans to apply dust suppression throughout the summer months in the same locations as 2018, and believes that the identification of these potential areas of concern, application of dust suppressant throughout the summer months, and monitoring of dustfall levels satisfies requirements of the Project Certificate with respect to dust suppression.

Constant wildlife monitoring to date has indicated no significant road-related effects, dust monitoring has indicated no trend towards increasing rates of dustfall, and risk assessment has indicated no incremental risk for wildlife from chemical contaminants near the AWAR. Therefore, impacts of Meadowbank AWAR road dust do not appear to be exceeding predictions made in the FEIS.

It is Agnico belief that the dust suppressing efforts in areas identified by community stakeholders and extensive monitoring studies completed and ongoing on the different projects roads, meets the intent of Condition 74 of the Project Certificate. Agnico intents to continue active monitoring as per the Air Quality and Dustfall Monitoring Plan. Therefore, no further assessment for particulate matter would be required unless trending changes are noticed since the smallest zone of influence in the FEIS shows unlikely effects in passive dustfall results along the AWAR. Agnico Eagle is determined to keep quality monitoring methods, and as such, intends to keep assessing possibilities to evaluate further if comparison to FEIS predictions are being exceeded.

8.14.2 Whale Tail Site

As required by NIRB Project Certificate No.008 Condition 1*: The Proponent shall:*

a) ***Develop and implement an Air Quality Monitoring and Management Plan that includes clear objectives and that specifies air quality monitoring thresholds that will trigger adaptive management responses and actions;***
b) ***In the implementation of the Plan, the Proponent shall demonstrate through active and passive monitoring of dustfall, for criteria air contaminant concentrations, incinerator stack testing, and vegetation, soil and snow chemistry sampling that dustfall and emissions of carbon monoxide (CO), nitrogen dioxide (NO2), ozone (O3), sulphur dioxide (SO2), suspended particulate matter, mercury, dioxins and furans, and other chemicals remain within predicted levels and, where applicable, within levels or limits established by all applicable guidelines and regulations;***
c) ***If exceedances occur, the Proponent shall provide an explanation for the exceedance, a description of planned mitigation, and shall conduct additional monitoring to evaluate the effectiveness of mitigative measures; and***
d) ***The Proponent shall also develop, implement, and report on the quality assurance and quality control protocols used to ensure data reliability and proper functioning of equipment.***

And

As required by NIRB Project Certificate No.008 Condition 2*: Prior to commencing construction activities the Proponent shall update the existing Dust Management and Monitoring Plan for the Meadowbank Mine site to address and/or include the following additional items:*

- ***Align plan requirements with commitments made in the Final Environmental Impact Statement and during the Final Hearing to monitor dust along the existing all-weather access road, the Amaruq haul road and any other roads and trails associated with the Project.***
- ***Verify commitments to the utilization of dust suppressants along the all-weather access road, the Amaruq haul road and any other roads and trails associated with the Project, including a description of the type of suppressant to be utilized and the frequency and timing of applications to be made throughout the various seasons of road use.***
- ***Outline the specific triggers, thresholds, and adaptive management measures that will apply if monitoring indicates that dust deposition is higher than predicted.***

The Proponent shall report annually to the Nunavut Impact Review Board with a summary of its dust management activities.

8.14.2.1 Air Quality and Dustfall Monitoring Mine Site

The Air Quality and Dustfall Monitoring Plan was updated in March 2019 (version 4) and is submitted as part of the 2018 Annual Report. The update was to address concerns raise by ECCC in the letter '03MN107/16MN056 – Agnico Eagle Mines Ltd. – Meadowbank Gold Project and Whale Tail Project – 2017-2018 Annual Monitoring Report ECCC, Responses to NIRB Recommendations'.

The 2018 air quality and dustfall monitoring program at Whale Tail was conducted according to the Air Quality and Dustfall Monitoring Plan - Version 3 (May, 2018).

No monitoring at Whale Tail site occurred in 2018. One station (DF-5) is sited with the communications tower on the eastern boundary of the Whale Tail Pit in an area predicted to receive elevated concentrations of particulate matter (TSP, PM_{10} and $PM_{2.5}$) and NO_2 relative to concentrations predicted further from the project footprint. Monitoring at DF- 5 will include TSP, PM_{10}, $PM_{2.5}$, passive NO_2, and dustfall year-round. Monitoring at this station will begin in 2019. Please refer to the Air Quality and Dust Monitoring Report (Appendix 39) for more details regarding the complete review and interpretation of the results.

Daily road watering and, if necessary, the application of chemical dust suppressants Tetraflake ($CaCl_2$) will be employed at the Whale Tail Pit Project to mitigate emissions of fugitive road dust during the frost-free summer season.

8.14.2.2 Whale Tail Haul Road Dustfall Monitoring

Below is a summary of the Air Quality and Dust Monitoring Report (Appendix 39). Please refer to the complete report for more details regarding the interpretation of the results and monitoring conducted in 2018.

Dustfall transects are established between kilometers 18 & 19, 36 & 37, and 54 & 55 along the Whale Tail Haul Road. Dustfall samples are collected twice during the summer season over one month averaging periods. Each transect includes stations at 25 m, 100 m, 300 m and 1000 m upwind, (east/north) and downwind (west/south) of the haul road.

All samples for dustfall collected along the Whale Tail Haul Road were within FEIS predictions with the exception of one 25-m sample at km 37. Given the high variability observed in dustfall samples, particularly in locations close to the road, this isolated event is not expected to result in impacts greater than predicted overall. However, data will continue to be reviewed in subsequent years to determine whether a trend towards elevated dustfall rates is occurring. The more general FEIS prediction that the Alberta Environment guideline for recreational areas would not be exceeded beyond 300 m of the road was met in all cases.

Based on the modelling of the dust emissions on the road, and the experience and monitoring data of the Meadowbank AWAR from Baker Lake to the mine site, use of chemical dust suppressants is not expected for the Whale Tail Pit Haul Road. Chemical dust suppressants may be only used as a last resort and only in accordance with the Environmental Guidance for Dust Suppression published by the Government of Nunavut Department of Environment (GN 2014).

Dust mitigation measures that will be employed by Agnico to suppress the production of fugitive dust along the Whale Tail Pit Haul Road included:

- enforcing speed limits;
- grading of road surfaces;
- placement of new coarser material onto the road surface; and
- if necessary, road watering or application of dust suppressants

As detailed in Table 4 of the Air Quality and Dustfall Monitoring Plan Version 4 (Appendix 51), threshold will be used to determine when mitigation measures need to be initiated. Non-quantitative thresholds were establish and included among others, deterioration of visibility, safety concern, high dust levels evident near significant waterbodies, etc. In Q2 2019, Agnico will hold a discussion with ECCC during the technical meeting of the Whale Tail Expansion Project to discuss and determine in collaboration, the threshold that will trigger adaptive management responses and actions. The Air Quality and Dustfall Monitoring Plan will then be updated.

8.15 GREENHOUSE GASES

8.15.1 Meadowbank Site

As required by NIRB Project Certificate No.004 Condition 73*: Cumberland shall undertake to conserve the Project's use of energy, monitor the Project's greenhouse gas emissions, and continuously review and, if possible, consider for adoption new technologies to ensure greenhouse gases meet the latest Canadian standards or criteria.*

Agnico has an Energy and Greenhouse Gas Management Strategy developed to create value for the shareholders by operating in a safe, social and environmentally responsible manner.

Different projects were held by Agnico in previous years to reduce the energy consumption and increase or evaluate the use of new technologies:

- Use of summer fuel – project ongoing
- Use of solar panel northern condition operation - test completed and successful
- Identification of energy-saving opportunity in regards the carbon tax
- TSM flow chart implemented with Strategic Optimization team for energy-saving opportunities.
- Energy dashboard improvement for better energy consumption monitoring
- Energy dashboard internal audit to ensure energy consumption data accuracy
- Time study of the service equipment to increase capacity with the same consumption
- Optimization of the incinerator to increase capacity with the same consumption
- Use of composter

The Greenhouse Gas Reduction Plan (Appendix 51) detailed in Section 4 includes some of the reduction initiative above. The initiatives described are for both Meadowbank and Whale Tail Site.

8.15.2 Whale Tail Site

As required by NIRB Project Certificate No.008 Condition 3*: The Proponent shall maintain a Greenhouse Gas Emissions (GHG) Reduction Plan which includes:*

- ***An estimate of the Project's GHG baseline emissions;***
- ***A description of monitoring measures to be undertaken, including the methods, frequency, parameters, and a description the analysis that will be carried out on the monitoring data generated; and***
- ***A description of mitigative and adaptive strategies planned, and taken, to reduce project-related greenhouse gas emissions over the Project lifecycle.***

The Plan should be submitted to the Nunavut Impact Review Board (NIRB) within 60 days of the issuance of the Project Certificate, with results submitted annually thereafter or as may otherwise be required by the NIRB.

The Greenhouse Gas Reduction Plan (Appendix 51) was submitted as Version 1 on May 2018. Table 8.112 summarizes predictions of GHG emissions for the Meadowbank and Whale Tail Project for the peak year of production in 2020.

Table 8.112. Greenhouse Gas Summary for the Project and the Meadowbank Mill (2020)

Emissions Source	Greenhouse Gas Emissions (kt CO_2e)
Off-road exhaust	52.8
On-road exhaust	4.4
Power plant	4.1
Camp heater	2.9
Whale Tail Project Total [(a)]	64.2
Meadowbank mill	180.0
Whale Tail Project plus Meadowbank Total	244.0

(a) Project Total includes emissions from the Whale Tail Pit and the Haul Road.

kt CO_2e = kilotones of carbon dioxide equivalents; % = percent; <= less than

Source: Modified from Whale Tail FEIS, Volume 4 – Atmospheric Environment (Agnico Eagle, 2016)

In 2018, Agnico emitted a total of 186.12 Kt $CO2_e$, which include 152.9 Kt CO2e and 33.22 Kt $CO2_e$ for Meadowbank and Whale Tail respectively. The emission for 2018 remain below the estimated emission detailed in Table 8.112. As Agnico emitted more than 50Kt per year of $CO2_e$/yr for combined Meadowbank and Whale Tail site, report will be submitted to the Canada's Greenhouse Gas Emission Reporting Program by June 1, 2019. As describe in Section 8.15.1 above, Agnico is continually seeking for reduction project to reduce the GHG emissions and track the emission on a monthly basis.

8.16 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.***

In March 2007, a harvest study was initiated by Agnico Eagle in association with the Baker Lake Hunters and Trappers Organization (HTO) in order to monitor and document the spatial distribution, seasonal patterns and harvest rates of hunter kills before and after construction of the Meadowbank All-Weather Access Road (AWAR). The harvest study was conducted annually and is open to Inuit and non-Inuit residents of Baker Lake who are at least 16 years of age. The harvest study focuses primarily on terrestrial wildlife harvests; however, fishing results are also recorded by the harvest study administrator in support of on-going creel surveys.

In 2016, 2017, 2018, Agnico suspended the harvest data collection as participation rates were decreasing. Considering possible participants fatigue and overall need for renewal, it was intended to draft improved methodology that would involve the stakeholders within the program. Discussions were held to initiate discussions on past experiences and path forward for the Hunter Harvest Study (HHS), including creel surveys. Parties involved included community agents, the BL HTO, GN and KIA. The process also included the Community affairs department from Agnico Eagle.

A Hunter Harvest Study committee was planned to be initiated in 2018 as stated in the 2017 Annual report. The intention to have a community led program was slower to implement than originally planned. Third party projects presented within the community created confusion and dispersed availability of resources within the proposed HHS committee.

Research alternatives were also assessed in 2018 and discussions held with ARCTIConnexion and ELOKA, for example, to develop a program that would be led and managed by the community stakeholders and make harvest data collecting more efficient. This would have ensured that data within the program would have been shared and accessible for all participants and make data collecting silos, where every party collects data without sharing, obsolete. Unfortunately, limited resource availability made moving forward in this path impossible in 2018.

Agnico has also contracted consultants to assess alternative methods of collecting data for the HHS and feasibility of re-starting the study in 2018 but the tight timeline for implementation combined with multiple similar projects within the community on data collection (community base water monitoring programs, watershed studies, MWMB Harvester recruitment) caused resources to be spread. Thus Agnico decided to hold its HHS strategy to not add confusion and impact community based projects.

Agnico Eagle is already started planning the 2019 HHS for March 2019. The study approach will be similar to previous years but suggestions and guidance received during the consultation period will be incorporated into the study. Study results for 2019 will be presented in the 2019 annual report. More details are provided in Section 8.18.1.2

Moving forward Agnico intends to continue working with the GN, KIA and HTO to ensure a representative number of participants and long term success of the program. The HHS, including creel surveys, would be implemented in 2019 with the collaborative approach.

8.17 NO FISHING POLICY

As Required by NIRB Project Certificate No.004, Condition 52: ***Cumberland shall enforce a no-fishing policy for employees while working on the job site.***

Agnico Eagle has a no-fishing policy for its Meadowbank and Whale Tail Mine Sites. The policy is enforced all through the year within environmental inspections. There were no incident to report in 2018.

8.18 TERRESTRIAL ECOSYSTEM MANAGEMENT PLAN

As Required by NIRB Project Certificate No.008, Condition 28: ***The Proponent shall submit a revised TEMP to the Nunavut Impact Review Board (NIRB) within one (1) year of issuance of the Project Certificate, with subsequent versions provided as appropriate. Results of the TEMP shall be reported to the NIRB annually.***

Agnico submitted the TEMP Version 5 in June 2018. This new version includes final revisions following hearings and receipt of NIRB Whale Tail Project Certificate no. 008. Agnico is submitting via the 2018 Annual Report an updated TEMP Version 6, December 2018 (Appendix 51) to fully comply with the Project Certificate and also to reflect discussions held at the TAG meeting. Please take note that the 2018 monitoring was completed in compliance with the Version 5 (June 2018). This section include both Meadowbank and Whale Tail site, as condition from Project Certificate no. 004 regarding the Wildlife Summary Report also apply to the Whale Tail site.

8.18.1 Wildlife Monitoring Meadowbank and Whale Tail Site*

8.18.1.1 Annual Monitoring

As Required by NIRB Project Certificate No.004, Condition 55: ***Provide the Annual Wildlife Summary Monitoring Report.***

As a requirement of the NIRB Project Certificate no. 004 and no. 008, the 2018 Wildlife Monitoring Summary Report represents the 13th of a series of annual Wildlife Monitoring Summary Reports for the Agnico Eagle Mines Ltd. Meadowbank Division. Below is a summary of the program for 2018. The complete report presenting the whole program and complete analysis of the result is presented in Appendix 45. Baseline and monitoring programs were first initiated in 1999 and will continue throughout the life of the mine. Details of the wildlife monitoring program for the project are provided in the Terrestrial Ecosystem Management Plan (Version 5, 2018). The 2018 report provides the objectives, methodology, historical and current year results, and management recommendations for each monitoring program. The 2018 Wildlife Monitoring Summary Report builds on data presented in previous reports and incorporates monitoring recommendations from these reports.

A habitat analysis was completed for the first time since 2014. The approach taken in 2018 varied from previous years where habitat losses were compared to values predicted in the EIA and subsequent extensions. Given the difficulty in tracking approved extensions, additions, and mine plan changes,

* TSM- Biodiversity and Conservation Management

habitat losses were instead compared to habitat availability within permitted areas. A thorough analysis of habitat losses for the Meadowbank and Whale Tail areas found that losses were well within overall habitats in permitted areas. As well, high suitability habitat losses were substantially lower than was available within permitted areas.

Seven active Peregrine Falcon (Falco peregrinus) nests were observed and monitored at quarry sites along the AWAR in 2018, with successful nesting confirmed at three nests. No raptor nests were monitored along the Whale Tail Haul Road or in the vicinity of the Whale Tail Pit in 2018. Raptor nest management plans were not warranted at any of the active nest sites as no project-related effects on raptor nesting success were observed.

The GN Caribou (Rangifer tarandus) collaring program, ongoing for the past 11 years in the Baker Lake area, continued in 2018 with monitoring of existing collared animals. Seasonal Caribou movements within and adjacent to the Meadowbank Regional Study Area (RSA) were tracked and mapped throughout the year. Collared Caribou were present throughout the year but particularly during spring migration (i.e., April and May). Additional collars were deployed for Baker Lake animals in 2018 and by the end of the year, 40 collars from three deployments periods remained active.

A Hunter Harvest Study (HHS) was conducted from 2007 to 2015, but the program was suspended following declining participation and difficulty in interpreting limited hunting data. In 2016 and 2017, Agnico Eagle, the HTO, KivIA, GN, and other agencies met to discuss the HHS, and in early 2019 the study was relaunched. Results from 2019 will be summarized in next year’s annual report.

Numerous road closures were implemented on all project roads, particularly in April and May, to ensure safe passage to migrating Caribou herds. No Caribou fatalities occurred because of activities at the mine or along project roads. With the Authorization of the GN officer, one Wolverine (Gulo gulo) and one Wolf (Canis lupus) needed to be euthanized after attempts to deter the animals were unsuccessful. In general, improved food-handling practices and employee awareness programs at the mine site have helped prevent mine-related fatalities.

Appendix C of the TEMP, Section 2.2.2 of the Wildlife Protection and Response Plan describes the mitigation measures in place for prevention of the wildlife attraction. The mitigation measures are related to food wastes and garbage, chemicals (e.g., road salt) and their refuse (e.g., empty fuel containers, wildlife carcasses (e.g., road kills, hunter kills), movement and human activity (e.g., movement of people and equipment outdoors) and roads (which may create preferential travel corridors for wildlife, can lead to vehicle collisions and increased exposure to wildlife encounters at the Project site). Agnico routinely reassesses its measures in relation to prevention and consistently maintains awareness by conducting toolbox meetings to all departments on site. By maintaining awareness on such topics as mentioned in Appendix C of the TEMP (wildlife attractant, garbage management, wildlife health, and wildlife and vehicle, wildlife and buildings, reporting wildlife observations and incidents, protocols for dealing with problem wildlife), Agnico is confident measures in place will ensure to limit potential impacts.

8.18.1.2 Harvest Study Results

As required by NIRB Project Certificate No.004 Condition 54

a. Updated terrestrial ecosystem baseline data

See “2018 Wildlife Monitoring Summary Report” attached in Appendix 45.

e. Details of a comprehensive hunter harvest survey to determine the effect on ungulate populations resulting from increased human access caused by the all-weather private access road, including establishing preconstruction baseline harvesting data, to be developed in consultation with local HTOs, the GN-DOE and the Nunavut Wildlife Management Board.

As required in the TEMP, in March 2007, a harvest study was initiated by Agnico Eagle in association with the Baker Lake Hunters and Trappers Organization (HTO) in order to monitor and document the spatial distribution, seasonal patterns and harvest rates of hunter kills before and after construction of the Meadowbank All-Weather Access Road (AWAR). The harvest study was conducted annually and is open to Inuit and non-Inuit residents of Baker Lake who are at least 16 years of age. The harvest study focuses primarily on terrestrial wildlife harvests; however, fishing results are also recorded by the harvest study administrator in support of on-going creel surveys.

In 2016, 2017, 2018, Agnico suspended the harvest data collection as participation rates were decreasing. Considering possible participants fatigue and overall need for renewal, it was intended to draft improved methodology that would involve the stakeholders within the program. Discussions were held to initiate discussions on past experiences and path forward for the Hunter Harvest Study (HHS), including creel surveys. Parties involved included community agents, the BL HTO, GN and KIA. The process also included the Community affairs department from Agnico.

A Hunter Harvest Study (HHS) committee was planned to be initiated in 2018 as stated in the 2017 Annual report. The intention to have a community led program was slower to implement than originally planned. Third party projects presented within the community created confusion and dispersed availability of resources within the proposed HHS committee.

Research alternatives were also assessed in 2018 and discussions held with ARCTIConnexion and ELOKA, for example, to develop a program that would be led and managed by the community stakeholders and make harvest data collecting more efficient. This would have ensured that data within the program would have been shared and accessible for all participants and make data collecting silos, where every party collects data without sharing, obsolete. Unfortunately, limited resource availability made moving forward in this path impossible in 2018.

Agnico has also contracted consultants to assess alternative methods of collecting data for the HHS and feasibility of re-starting the study in 2018 but the tight timeline for implementation combined with multiple similar projects within the community on data collection (community base water monitoring programs, watershed studies, MWMB Harvester recruitment) caused resources to be spread. Thus Agnico Eagle decided to hold its HHS strategy to not add confusion and impact community based projects.

Agnico Eagle is already started planning the 2019 HHS for March 2019. The study approach will be similar to previous years but suggestions and guidance received during the consultation period will be incorporated into the study. Study results for 2019 will be presented in the 2019 annual report.

This HHS approach will include:

1. Liaising with HTO members, the community liaison officer, and other stakeholders with an interest in the Baker Lake Hunter Harvest Study (Q1 2019, completed);

2. Preparing and distributing 2019 and 2020 hunter harvest calendars (Q1 2019, completed);

3. Building relationships with hunters/participants in the HHS and corresponding on a quarterly or more frequent basis (Quarterly);

4. Conducting frequent field visits in 2019 to distribute calendars, sign up hunters/participants, promote the study, and build relationships in the community (all year);

5. Conduct field visits in early 2020 to collect remaining 2019 data from participants, distribute prizes, hand out 2020 calendars, and identify other potential participants; and

6. Conduct preliminary data management, analysis, and writing for the 2019 annual report.

Moving forward Agnico Eagle intends to continue working with the GN, KIA and HTO to ensure a representative number of participants and long term success of the program. The HHS, including creel surveys, is implemented in 2019 with the collaborative approach.

f. Details of annual aerial surveys to be conducted to assess waterfowl densities in the regional study area during the construction phase and for at least the first three (3) years of operation, with the data analyzed and compared to baseline data to determine if significant effects are occurring and require mitigation.

At Meadowbank site, given the low densities of waterbird nests identified at the mine site and along the AWAR from 2005 - 2012 (i.e., too low to determine whether changes in nest abundance or success have occurred), and the absence of data suggesting that mine or road-related effects are occurring, the waterbird nest survey program has been discontinued.

The Whale Tail Project requires the construction of two dikes within Whale Tail Lake to divert water from the proposed pit to surrounding lakes and tributaries, resulting in flooding that will elevate water levels by 4 m and inundate approximately 157 ha of tundra during the active bird nesting window. To investigate mitigation options to minimize flooding-related impacts to birds, Trent University, in collaboration with Environment and Climate Change Canada and Agnico, conducted active bird nest surveys and experimented with deterrent options in summer 2018 at the Whale Tail site. The purpose of the research is to assess the degree of risk posed to migratory birds by mining-induced flooding during the nesting period, and to determine the most effective bird deterrents and how they should be applied. Please refer to the complete report 2018 Migratory Bird Protection Report found in Appendix 48 and Section 8.18.5 below.

g. Details of an annual breeding bird plot surveys and transects along the all-weather road to be conducted during the construction phase and for at least the first three (3) years of operation.

Details of the breeding bird plot surveys are provided in Section 14 of the 2018 Wildlife Monitoring Summary Report" (Appendix 45). The breeding bird plot monitoring program is to continue every year during the construction period, for at least the first three full years of mine operation (2010 to 2012) in accordance with the TEMP dated 2006. The most recent PRISM plot survey was conducted in at Meadowbank Site in 2015, and the next survey is theoretically planned for 2019. The frequency for

Whale Tail will be based on the new TEMP Version 6, December 2018 and further discussions with ECCC on synergies with research programs in data collection for plot surveys. .

The objective of the breeding bird plot monitoring program is to confirm that a mine-related change of 20% function, determined by an increase or decrease in local breeding bird abundance, richness, and diversity, has not occurred. The program uses the widely accepted Canadian Wildlife Service's (CWS) PRISM protocols. A secondary objective of the monitoring program is to determine more effective ways to prevent disturbance to nesting birds based on feedback from mitigation measures and observations.

For the breeding bird PRISM plots, Meadowbank data analysis in 2015 showed that most bird community indices were variable with little difference in overall trends between mine and control plots. Thresholds had not been exceeded and no additional management or mitigation considerations were necessary.

For the breeding bird transects, Meadowbank data analysis in 2011 and 2015 indicated that no road-related effects had occurred to date, and thresholds had not been exceeded; therefore, annual transect surveys were permanently suspended after 2015.

For Whale Tail, the North American Breeding Bird Survey Route will occurred every three years.

8.18.1.3 Caribou Migration Corridor Information Summary

As required by NIRB Project Certificate No.004 Condition 56: ***Maps of caribou migration corridors shall be developed in consultation with Elders and local HTOs, including Chesterfield Inlet and placed in site offices and upgraded as new information on corridors becomes available. Information on caribou migration corridors shall be reported to the GN, KIA and NIRB's Monitoring Officer annually.***

Caribou telemetry data are provided in Section 6 of the 2018 Wildlife Monitoring Summary Report (Appendix 45).

8.18.1.4 Caribou Collaring Study Meadowbank

As required by NIRB Project Certificate No.004 Condition 57***: participate in a caribou collaring program as directed by the GN-DOE***

And

As required by NIRB Project Certificate No.008 Condition 29***: The Proponent shall, in collaboration with the Government of Nunavut, collect additional caribou collar data and conduct analyses of this data to quantify the zone of influence and associated effects of project components on caribou movement for a study area that includes the Whale Tail mine site, the haul road, the Meadowbank Gold Mine and its All-Weather Access Road. A summary of the analyses and associated effects shall be provided annually in the Proponent's annual report to the Nunavut Impact Review Board.***

Agnico continues to collaborate with the GN DoE in a Caribou satellite-collaring program that includes data collected within the Meadowbank RSA, as per the recently renewed (2017) Memorandum of Understanding with government partners. The GN biologists discuss collar deployments with hunters and Elders and get approval prior to proceeding. Discussions are ongoing between Agnico, GN, and other partners on the best path forward to ensure Caribou migration maps continue to integrate Elders and local HTO input. Detailed results can be found in Section 6 of the 2018 Wildlife Monitoring Summary Report (Appendix 45).

Information pertaining to the identification and location of various herds that use the Meadowbank and Whale Tail RSAs at different times of the year are important components of ongoing monitoring and management efforts at the mine site and along project roads.

The satellite-collaring program was developed to provide information on the distribution of Caribou occurring within the Meadowbank RSA and contribute data to ongoing satellite-collaring programs for the Ahiak, Qamanirjuaq, and other herds. The satellite-collaring program, along with GN DoE regional data, is an important monitoring and management tool that provides a regional perspective on Caribou activity near mine operations. Another key objective of the program is to provide timely information for the Caribou management and monitoring strategy at the Meadowbank and Whale Tail sites (i.e., Decision Tree approach; see 2018 TEMP).

At the beginning of the 2018 monitoring year, only 10 collars were active, including four from the 2015 deployment and six from the 2016 deployment. In April 2018, a further 36 collars were deployed in the Baker Lake area. By the end of 2018, a total of 40 collars were active, including three from the 2015 deployment, four from 2016 deployment, and 33 from the 2018 deployment. A summary of 2018 locations and movement patterns for Caribou collared around Baker Lake by season is described in Section 6 and Figure 6.1 of the 2018 Wildlife Monitoring Summary report (Appendix 45). Seasonal movements of collared Caribou in close proximity to the Meadowbank RSA and LSA in 2018 are shown in Figure 6.2 of the 2018 Wildlife Monitoring Summary (Appendix 45).

Movements for Qamanirjuaq herd collared animals, a program also supported by Agnico, and animals collared by the Government of the Northwest Territories are provided for context in the 2018 Wildlife Summary Report (Appendix 45). No additional collaring of the Qamanirjuaq herd was conducted in 2018; however, 43 collars were active (i.e., 12 from the 2015 deployment, 8 from 2016, and 23 from 2017) and monitoring movements of the Qamanirjuaq herd at the end of 2018.

8.18.1.5 Work Stop due to wildlife

As required by NIRB Project Certificate No.004 Condition 60*: Whenever practical, Cumberland shall implement a stop work policy when wildlife in the area may be endangered by the work being carried out.*

Numerous road closures were implemented on all project roads (AWAR, Vault and Whale Tail Haul roads), particularly in April and May, to ensure safe passage to migrating Caribou herds. No Caribou fatalities occurred because of activities along project roads. Section 3.6.5 of the 2018 Wildlife Summary Report (Appendix 45) detailed the 2018 road closure. The decision tree presented in the TEMP will be used to determine the need to apply a stop working or road closure.

8.18.1.6 Raptor Nest Survey

The raptor nest survey monitoring program has been designed to confirm that mine-related activities do not result in inadvertent negative effects on nesting raptors. Raptor surveys along the proposed AWAR alignment in 2005 (i.e., prior to construction) indicated that only low suitability habitat for nesting raptors was available. During AWAR construction in 2007/2008, excavated and blasted rock materials were extracted from numerous quarries along the alignment, resulting in some moderate and high suitability raptor nesting habitat areas characterized by steep rock walls. Established Peregrine Falcon nests within some of these quarries are monitored on an annual basis to evaluate occupancy.

In the Whale Tail Pit and Haul Road study area, researchers from the University of Alberta identified 56 occupied raptor nests during surveys in 2015, 2016, and 2017. The most common nesting species was Peregrine Falcon, followed by Gyrfalcon (Falco rusticolus) and Rough-legged Hawk. Nests of Common Raven (Corvus corax) were also identified during the raptor nest surveys. Most occupied nests (43) were located north of the Whale Tail Pit study area, while the remainder (13) were along the Whale Tail Haul Road. None of the occupied nests will be disturbed by proposed development activities, but four nests (i.e., 1 Peregrine Falcon; 3 Rough-legged Hawk), are located in the Whale Tail LSA.

Detailed results can be found in Section 12 of the 2018 Wildlife Monitoring Summary Report" (Appendix 45).

The primary objectives of the raptor nest survey monitoring program are to:

1. Confirm that raptor nest failures are not be caused by mine-related activities. The threshold level is one nest failure per year; and

2. Confirm that no project-related mortality of raptors occurs. The threshold level of mortality is one individual per year.

At Meadowbank Site and AWAR, in 2018, seven active Peregrine Falcon nests were documented in Quarries 2, 3, 16, 18, 19, 21 and 22, all previous nesting locations. No falcon activity was observed at previous nest sites at Quarry 8 (2017), Quarry 17 (2017), Portage Pit (2013), and Goose Pit (2016) (see Table 12.1). In addition to the seven active nest sites in 2018, falcon activity was observed at four additional quarry sites (i.e., Quarries 5, 7, 9, and 10) and one pit (Vault) during the monitoring program. Cumulative information on Peregrine Falcon nests from 2009 to 2018 is summarized in Table 12.1 and Figure 12.1 of the 2018 Wildlife Monitoring Summary Report (Appendix 45).

Observations made throughout the nesting season on raptor activity and nesting success are detailed in Table 12.2 of the 2018 Wildlife Monitoring Summary Report (Appendix 45). Nesting success was confirmed through identification of maturing chicks at four out of seven active nesting sites along the AWAR in 2018. The other three nests appeared to be abandoned at some point during the breeding season. At the Quarry 3 nest, one sick or wounded chick was observed on 18 July with no subsequent observations of adults or young. At Quarry 19, only a broken egg was observed on 18 July with no sign of any falcons after this date. At Quarry 22, one adult and one apparently abandoned egg (i.e., no defensive behavior by adult) was observed on 18 July. Specific raptor nest management plans were not warranted at any of the active nest sites, as mine-related activity was minimal in the quarries.

Additional observations of raptor activity around the mine site are included in Appendix E of the 2018 Wildlife Summary Report. The first Peregrine Falcon of the season was observed flying over the Vault Pit on 23 May. Falcons were also documented the last week of May and through June and July. The first Rough-legged Hawk of the year was observed along the AWAR on 24 May. Other individuals were sighted the last week of May and in July. Individual Bald Eagles were recorded along the AWAR on 11 and 23 August. Bald eagle, Peregrine Falcon, and Rough-legged Hawk were observed during AWAR surveys.

For Whale Tail Site, no active raptor nests were monitored within the Whale Tail Pit and Haul Road LSA in 2018. Raptors recorded along the Whale Tail Haul Road included Rough-legged Hawks on 02 and 27 July, a Bald Eagle on 21 June, and a Snowy Owl on 18 October. A Snowy Owl was also observed at the Amaruq Camp on 05 April.

8.18.1.7 Deterrence of raptors

As required by NIRB Project Certificate No.008 Condition 36: ***Prior to removal or deterrence of raptors, the Proponent will contact the Government of Nunavut – Department of Environment to discuss proposed mitigation options and, if required, will obtain the necessary permits. The Proponent shall include summaries of any mitigation measures implemented and permits obtained in fulfillment of this term and condition in the Proponent's annual report to the Nunavut Impact Review Board.***

There was no removal or deterrence of raptor at both the Meadowbank and Whale Tail sites in 2018.

8.18.2 Terrestrial Advisory Group

As required by NIRB Project Certificate No.008 Condition 27: ***The Proponent shall participate in a Terrestrial Advisory Group with the Government of Nunavut, the Baker Lake Hunters and Trappers Organization, the Kivalliq Inuit Association, and other parties as appropriate to continually review and refine mitigation and monitoring details within the Terrestrial Ecosystem Management Plan. Additional caribou collar data, results from associated studies, and other monitoring data as available should be considered for incorporation as appropriate. Finalized Terms of Reference for the Terrestrial Advisory Group shall be provided to the NIRB within six (6) months of issuance of the Project Certificate. A summary of outcomes from Terrestrial Advisory Group meetings shall be provided to the NIRB on an annual basis in the Proponent's Annual Report.***

And

As required by NIRB Project Certificate No.008 Condition 30: ***The Proponent shall collect additional data on caribou group sizes in proximity to the Project, and shall work with the Terrestrial Advisory Group to refine appropriate caribou group size thresholds that trigger additional mitigation. Initially, the group size thresholds should be set at 110 (fall), 25 (winter and summer), and 12 (spring). The Proponent shall ensure modifications to the group size thresholds are incorporated into the Terrestrial Ecosystem Management Plan and that this Plan along with a summary of consultation with the Terrestrial Advisory Group are submitted on an annual basis or as thresholds are otherwise modified in the Proponent's annual report to the to the Nunavut Impact Review Board.***

The Term of Reference for the TAG was provided to NIRB on November 1st, 2018. Refer to Appendix 46.

Meeting minutes from June 19-20, 2018 Terrestrial Advisory Group meeting (in fulfillment of NIRB Condition 27) which demonstrates Agnico's collaboration with GN biologists can be found in Appendix 47. In particular, action item 4, 7, 11 and "Day 1- TEMP Changes Review" (on pages 1 and 2 of the meeting minutes) reflect the changes Agnico has made in the TEMP as a result of consultation with GN biologists. Agnico has submitted V6 of the TEMP in December 2018 to NIRB and the TAG (action item 15). As well, Term of Reference (TOR) pursuant of a Memorandum of Understanding (MOU) were developed and discussed and an agreement was reached in 2018 meetings. The TOR will be officially signed by all parties in 2019.

8.18.3 Wildlife crossing Whale Tail site

As required by NIRB Project Certificate No.008 Condition 32: ***The Proponent shall engage with the Baker Lake Hunters and Trappers Organization and other relevant parties to ensure that safety barriers, berms, and designed crossings associated with project infrastructure, including the haul road, are constructed and operated as necessary to allow for the safe passage of caribou and other terrestrial wildlife. Summaries of engagement with the Baker Lake Hunters and Trappers Organization regarding implementation of this condition shall be provided to the Nunavut Impact Review Board along with details of the selected crossings in the Proponent's annual report to the Nunavut Impact Review Board.***

Two traditional land use crossing locations were identified during IQ/TK workshops and following meetings with the Hunters and Trappers Organization (HTO). A first location has been set at km 127 along the Whale Tail Haul Road. The crossing design is shown on Figure 6.1 of the Whale Tail Haul Road Management Plan (Appendix 51). More locations for Traditional Land Use Crossings will be identified in collaboration with the HTO. Haul traffic from the Whale Tail Pit to Meadowbank Mill will have the right-of-way. Traditional land users (i.e. hunters on ATVs or snowmobiles) crossing the Whale Tail Haul Road on identified ramps must yield to Haul Road Traffic; Haul Road Traffic approaching traditional land use crossings must be vigilant of the potential use by ATVs or snowmobiles. This intersection will have a stop sign on the traditional land use crossing locations to give way to the mine haul trucks. Hunters and traditional land users on snowmobiles or ATVs will have to stop, look both ways and yield to traffic before crossing the road. Traditional land use marked signs will be installed on the haul road to warn haul trucks and other vehicles on the road to ensure users protection and safety of traditional land users on ATVs or snowmobiles.

8.18.4 Wildlife Mortality Whale Tail site

As required by NIRB Project Certificate No.008 Condition 33: ***A summary regarding all wildlife incidents reported, including a reference to whether compensation was or will be provided by the Proponent for direct mortalities, as well as a description of any other steps taken in fulfillment of this term and condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board. The Proponent shall provide wildlife incident reports to the appropriate authorities in a timely fashion. Wildlife incident reports should include the following information:***

> ***a) Locations (i.e., latitude and longitude), species, number of animals, a description of the animal activity, and a description of the gender and age of animals if possible;***
>
> ***b) Prior to conducting project activities, the Proponent should map the location of any sensitive wildlife sites such as denning sites, calving areas, caribou crossing sites, and raptor nests in the project area, and identify the timing of critical life history events (i.e., calving, mating, denning and nesting); and***
>
> ***c) Additionally, the Proponent should indicate potential impacts from the project, and ensure that operational activities are managed and modified to avoid impacts on wildlife and sensitive sites.***

Section 3.6.6 of the 2018 Wildlife Summary Report (Appendix 45) describe road-related wildlife mortality along the Whale Tail Haul road in 2018. In 2018, only two (2) artic hare mortalities were reported and no compensation to KIA were required.

Section 4.5.6 of the 2018 Wildlife Summary Report (Appendix 45) provide a summary of recorded wildlife fatalities near or within the mine site in 2018. The below is summary of the of the project related mortality that occurred at Whale Tail Site in 2018. Similar information regarding Meadowbank site can also be found in Section 4.5.6 of the 2018 Wildlife Summary Report.

- On December 26th, 2017, a fox had chewed and broken the heat trace of one of the grease trap pipes. A skirting has been installed around the kitchen area of the camp to prevent future incidents. On January 8th, 2018, the Whale Tail Senior Environmental Technician contacted Conservation Officer III Russell Toolooktook to discuss the overall situation and take recommendations on furthers steps to be taken. The written wildlife destruction authorization was received via email from the Conservation Office on January 15th. On January 17th, 2018, the Artic fox was dispatched by Agnico. As per the IIBA Schedule J, Item 6, a compensation in the amount of $1,000 was sent to KIA. The complete report regarding this incident can be found in Appendix E of the 2018 Wildlife Summary Report (Appendix 45).

- On November 29th, an energy and infrastructure worker found a dead artic fox in the grease trap building during his preventive maintenance. Subsequently, a carpenter conducted maintenance and fixed holes around that building to avoid wildlife to enter into the building. The building was re-inspected to ensure that there is no small access for any wildlife. As per the IIBA Schedule J, Item 6, a compensation in the amount of $1,000 was sent to KIA. The complete report regarding this incident can be found in Appendix E of the 2018 Wildlife Summary Report (Appendix 45).

8.18.5 Migratory Birds Protection Plan Whale Tail site

As required by NIRB Project Certificate No.008 Condition 34: ***The Proponent will maintain a Migratory Birds Protection Plan for the Project in consultation with Environment and Climate Change Canada and other interested parties. The plan should include and/or demonstrate that the Proponent give consideration to the following:***

- ***Information obtained from baseline characterization of migratory bird and vegetation communities within the predicted flood area;***
- ***Results of field tests and/or the thorough literature review of the effectiveness of preferred deterrence prior to actual flooding; and***
- ***Details regarding monitoring the effectiveness of mitigation measures during flooding.***

Results of implementation of the Migratory Birds Protection Plan shall be reported to the Nunavut Impact Review Board on an annual basis in the Proponent's annual report.

Agnico has submitted in July 2018 a Migratory Bird Protection plan as an appendix of the TEMP.

The 2018 Migratory Bird Protection report can be found in Appendix 48. Please refer to the report of the complete review of the 2018 results.

As part of the mine construction and operation, 2 flooded areas were identified following the Whale Tail Dike and Northeast dike construction. The flooding has the potential for incidental disturbance and destruction of migratory birds and their nests. As per Nunavut Impact Review Board (NIRB) Project Certificate No.008 Condition 34, the Migratory Birds Protection Plan (the Plan) describes how these impacts will be mitigated through use of visual and audio bird deterrents, and regular sweeps by Agnico Eagle staff to discourage nesting. Mitigation was planned to be focused between 2018 and 2020, or until water levels reach their maximum flood plain.

Mitigation measures to reduce impacts of flooding on migratory bird nesting at the Whale Tail site will be implemented in 2019 prior to flooding according to the Migratory Bird Protection Plan (July, 2018). As described in the Plan, mitigation measures will consist of deploying visual and audio bird deterrents, and regular sweeps by Agnico Eagle staff to discourage nesting. Since flooding had not yet occurred in 2018, mitigation measures will begin in 2019 in consultation with research partners and results of field studies conducted simultaneously in collaboration with Environment and Climate Change Canada and Trent University to understand the effectiveness of the various types of mitigation (deterrents)

Research studies were simultaneously initiated to determine the effectiveness of these mitigation measures (audio and visual deterrents) at nearby reference sites. This was the first of three study years, so complete results are not yet available.

Baseline nest surveys of the Whale Tail and Northeast diversion flood zones were also conducted during peak egg incubation period (June 24 – July 2, 2018) to determine the number of nests in the area to be flooded. A total of 50 nests were identified. This included 15 waterbird nests and 35 upland bird nests. These results indicate that although the proportion of waterbird nests was higher than predicted in the FEIS (10 nests), total impacts of flooding to nesting birds may be lower than predicted, as 98 total nests (waterbird + upland bird) were assumed impacted.

8.18.6 Species at Risk Whale Tail Site

As required by NIRB Project Certificate No.008 Condition 35: ***The Proponent shall ensure that the mitigation and monitoring strategies developed for Species at Risk are updated as necessary to maintain consistency with any applicable status reports, recovery strategies, action plans, and management plans that may become available through the duration of the Project. Information regarding development, implementation and monitoring of the measures developed by the Proponent in fulfillment of this term and condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board.***

Species of concern include those species identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as being At Risk or Threatened, and may be impacted by the Project. Species of concern for the Project are detailed in Table 8.113 below.

Table 8.113 Species of Concern Meadowbank and Whale Tail Study Areas

Species	COSEWIC Status	SARA Status	Effects Pathways
Barren-ground caribou	Threatened	No schedule	• mortality due to vehicle collisions • habitat loss • change in harvest due to improved access • barriers to movement and changes in behaviour
Grizzly bear	Special Concern	No schedule	• habitat loss • mortality due to attraction or vehicle collisions
Polar Bear	Special Concern	Schedule 1	• None anticipated
Wolverine	Special Concern	No schedule	• habitat loss • mortality due to attraction or vehicle collisions
Short-eared Owl	Special Concern	Schedule 1	• habitat loss
Peregrine Falcon	Special Concern	Schedule 1	• physical hazards to nests on mine infrastructure or in quarries
Red-Necked Phalarope	Special Concern	No schedule	• habitat loss

Agnico will ensure that the mitigation and monitoring strategies developed for Species at Risk Act (SARA) are updated as necessary to maintain consistency with any applicable status reports, recovery strategies, action plans, and management plans that may become available through the duration of the Project. Updates to the SARA will be considered during annual review and with each new revision of the TEMP.

8.18.7 Invasive Vegetation Species

As required by NIRB Project Certificate No.008 Condition 25: ***At least 30 days prior to first shipment of equipment and supplies to the site, the Proponent's mitigation plans, protocols, monitoring and inspection program required in fulfillment of this term and condition shall be provided to the NIRB for review. Subsequently, information regarding inspections, monitoring results, and any reports as referenced above shall be included in the Proponent's annual report to the NIRB. The Proponent shall:***

> ***a) Ensure that equipment and supplies brought to the project sites are clean and free of soils that could contain plant seeds or organic matter not naturally occurring in the area***
>
> ***b) Ensure that vehicle tires and treads are inspected prior to initial use in project areas;***
>
> ***c) Incorporate protocols for monitoring for the potential introduction of invasive vegetation species (e.g. surveys of plant populations in previously disturbed areas) into relevant monitoring and management plans for the terrestrial environment; and***

d) Ensure any introductions of non-indigenous plant species must be promptly reported to the Government of Nunavut Department of Environment.

The invasive plant monitoring component outlines the means by which Agnico plans to reduce Project-related effects to plant populations and communities, primarily through the mitigation and management of invasive species, and includes both environmental and follow-up monitoring. Proactive measures and monitoring programs are used to track conditions and implement further mitigation as required, while follow-up monitoring is used to verify the accuracy of impact predictions and adaptively manage and implement further mitigation as required.

Agnico has updated the TEMP (Version 6, March 2019) and submits the plan as part of the 2018 Annual Report to comply with Project Certificate No. 008, Condition 25.

The objectives of the vegetation monitoring and management component are as follows:

- measure distribution and abundance of non-native invasive plant species

- using industry standards and best practices, equipment and bulk supplies must arrive to Project site free of soil or plant debris to minimize the risk of invasive plant introduction

Specific thresholds for invasive plant monitoring include the following:

- no non-native invasive species will occur as a result of mining operations (i.e., new equipment or materials arrival).

Surveys for non-native invasive plant species will be undertaken in disturbed areas (e.g., active mine site, borrow pits) to identify and document the extent of any non-native invasive plant species that may occur on Whale Tail Site. Training will be given to the environmental department to familiarize them with the identification of invasive plant species.

Additionally, invasive plant inspection surveys will be completed on cargo in Becancour, prior to being loaded onto shipping vessel(s). A procedure (NU-PRO- ENV- Invasive Species Inspection Prior Loading onto Shipping Vessel) has been developed and is provided in Appendix 49.

The early detection of non-native invasive plant species is important, as preventing these species from becoming established is the most effective mitigation that can be employed. If non-native invasive plant species are identified in the Project area, they will be reported to Government of Nunavut Department of Environment (GN DoE), as per DoE guidelines.

If invasive plant are identified, the following action will be undertaken:

• Equipment and bulk supplies will be cleaned using brooms, brushes, shovels, water, or compressed air. Areas of particular concern include tires, tracks, skids, buckets, scoops, and packing materials.

- Accumulated soil, plant material or crop debris from openings, tracks, skids, wheels, buckets, scoops, and packing materials using a hand scraper, shovel, broom, or other methods.

- Additional focus should be made to areas where soil or plant debris can accumulate (i.e., tires or undercarriage).

Monitoring of invasive plant species will start in 2019 for cargo in Becancour and Whale Tail Mine Site.

8.19 COUNTRY FOOD

As required by NIRB Project Certificate No.004 Condition 67: ***Develop and implement a program to monitor contaminant levels in country foods in consultation with HC; a copy of the plan shall be submitted to NIRB's Monitoring Officer.***

In keeping with Agnico's Terrestrial Ecosystem Monitoring Plan and Nunavut Impact Review Board Project Certificate, Condition 67, a Wildlife Screening Level Risk Assessment (WSLRA) and Human Health Risk Assessment for the Consumption of Country Foods (HHRA) were completed in 2017 to evaluate risks to wildlife and human health from contaminant exposure during operation of the Meadowbank mine. As per the monitoring Wildlife Screening Level Risk assessment Plan (Appendix A of the TEMP (Appendix 51 2018 Annual Report) there was no monitoring regarding these programs in 2018. The WSLRA is completed every 3 years during mine operation so the next monitoring will be held on 2020 and will included Whale Tail Pit. The full 2017 WSLRA and HHRA reports are provided in Appendix G14 and G15 of the 2017 Annual Report, respectively, and summarized here for purpose information.

WSLRA and HHRA assessments were based on soil, water and plant tissue samples collected from onsite, near-site, AWAR, and reference sites in 2017. Methodology of the risk assessments follows the format of the pre-construction screening level risk assessments (2005), and initial assessments under operational conditions (2011). The WSLRA evaluated risk to wildlife (ungulates, small mammals, waterfowl and songbirds) from dietary ingestion of chemical contaminants. The HHRA evaluated risk to humans from consumption of country food items (caribou meat and organs; Canada goose meat). Both assessments used a hazard quotient approach. As per Condition 67, the 2014 and 2017 HHRA report incorporates recommendations from Health Canada's review of the 2011 assessment, as well as updates from the most recently published federal guidance document (Health Canada, 2012). Updated toxicity reference values and bio transfer ratios were used as available.

8.19.1 WSLRA

The general approach and methodology of this assessment are based on those presented in the risk assessment of baseline conditions (Azimuth, 2006), using samples of soil, water and plant tissue collected onsite, near-site, along the all-weather access road (AWAR) and at external reference locations. Exposure (estimated daily intake; EDI) was calculated from 95% UCLM concentrations in environmental media for each location, and toxicity reference values (TRVs) were developed from lowest-observed adverse effect levels (LOAELs) from the literature. TRVs were the same as those used in previous assessments.

HQ values were calculated as:

$$HQ = EDI / TRV$$

Where:

EDI = estimated daily intake (ug/kg body weight/day)

TRV = toxicity reference value (ug/kg body weight/day)

Risk was characterized as negligible when HQ ≤ 1.

Key findings were as follows:

- Risk to ungulates (caribou), small mammals (northern red-backed vole), and waterfowl (Canada geese) was found to be negligible (HQ < 1) for all contaminants of potential concerns (COPC) in all locations.

- Potentially unacceptable risks to songbirds from chromium (HQ>1) were identified for all locations, which is consistent with all previous assessments (baseline, 2011, 2014). HQ values exceeded 1 for onsite, near-site, AWAR, and external reference locations, indicating that risk from this COPC is not elevated as a result of mining activities. Chromium is naturally elevated in ultramafic rock, which is common in the region.

- All 90th centile concentrations of COPC in soil samples collected onsite were lower than values measured during the baseline (pre-construction) assessment except beryllium, for which a minor increase of 13% (0.5 to 0.57 mg/kg) was observed.

Overall the operation of the Meadowbank mine does not appear to be contributing excess risk to wildlife via dietary uptake of chemical contaminants.

8.19.2 HHRA

As recommended by Health Canada, a hazard quotient (HQ) approach was used to classify the risk associated with the consumption of country food items from onsite, near-site, AWAR, and external reference locations. Risk was classified as negligible for each contaminant of potential concern (COPC) if the calculated HQ value was ≤ 0.2 (Health Canada, 2012). For each COPC with an HQ value > 0.2, it was determined whether onsite, near-site or AWAR HQ values exceeded the corresponding external reference HQ value. In those cases, further investigation into the underlying data was performed to understand the potential for incremental risk due to mining activities over and above contributions from background materials.

Overall, calculated hazard quotients were the same as or lower than the previous assessment in 2014, which used identical methods, indicating that excess risk is not occurring as a result of accumulation of chemical contaminants due to mining.

Key findings were as follows.

Caribou Meat (Muscle)

- Negligible risk (HQ ≤ 0.2) is associated with the consumption of caribou muscle (meat) for most COPCs. For chromium, lead, thallium, and zinc, HQ values exceeded 0.2 for some consumption scenarios at all study areas, including the external reference site, which also occurred in previous assessments.
    - For zinc, the exceedance only occurred for heavy consumption by toddlers, and was the same (0.3) for all sites, indicating no incremental risk as a result of mining activities.
    - For chromium, lead, and thallium, onsite or AWAR HQs exceeded the corresponding external reference value under some consumption scenarios. However, the difference in HQ values between impacted and reference sites was not expected to be significant in any case, based on analyses of background variability for each COPC/food item combination. These results indicate that potential incremental risk as a result of mining activities is not distinguishable from background variation.

Caribou Kidney

- Negligible risk (HQ ≤ 0.2) is associated with the consumption of caribou kidney from all study locations for all COPCs except thallium. The HQ value for thallium was 0.3 for the onsite study area for heavy consumption by toddlers, and was 0.2 for the AWAR and external reference locations.
    - This difference is not expected to be significant, considering that HQ values marginally exceed 0.2 and tolerable daily intakes are typically considered to be within an order of magnitude of true values. As a result, incremental risk of the project associated with this COPC is not expected to be significant.

Caribou Liver

- Negligible risk (HQ ≤ 0.2) is associated with the consumption of caribou liver from onsite, AWAR, and external reference study areas for all COPCs except lead, which had HQs > 0.2 for all study areas, including the external reference site under some scenarios (maximum HQ of 0.6).
    - Although HQ values for lead were higher at onsite or AWAR locations compared to the reference site under some consumption scenarios, differences were marginal (0.1). This difference is not expected to be significant, considering that HQ values are low and tolerable daily intakes are typically considered to be within an order of magnitude of true values. As a result, incremental risk of the project associated with this COPC is not expected to be significant.

Canada Goose Meat

- Negligible risk (HQ ≤ 0.2) is associated with the consumption of Canada goose meat from onsite, near-site, AWAR and external reference study areas for all COPCs except chromium, for which the HQ value for heavy consumption by toddlers was 0.3 for both onsite and reference areas indicating no incremental risk as a result of the project.

Combined Consumption

- The combined consumption analysis produced no additional scenarios under which adverse health effects may potentially occur.

Overall, this analysis indicated that mining activities do not appear to be contributing significant incremental risk from COPCs to consumers of country food items sourced in and around the Meadowbank area. This is consistent with the baseline assessment (2005) which concluded that based on projected concentrations of COPCs in environmental media (soil and water), risk to persons consuming country foods would not increase appreciably following mine development.

8.20 ARCHAEOLOGY

8.20.1 Meadowbank and Whale Tail Sites

As required by NIRB Project Certificate No.004 Condition 69: ***carry out the Project to minimize the impacts on archeological sites, including conducting proper archeological surveys of the Project area (including the all-weather road and all quarry sites); [Cumberland] shall provide to the GN an updated baseline report for archeological sites in the Project area.***

And

As required by NIRB Project Certificate No.004 Condition 70: ***shall report any archeological site discovered during the course of construction, including a burial site, immediately and concurrently to the GN and KivIA. Upon discovering an archeological site, Cumberland shall take all reasonable precautions necessary to protect the site until further direction is received from the GN. In the event that it becomes necessary to disturb an archaeological site, Cumberland shall consult with Elders, GN and KivIA to establish a site specific mitigation plan, and obtain all necessary authorizations and comply with all applicable laws.***

And

As required by CIRNAC Land Lease 66H/8-1-4 Condition 66: ***If an archaeological site is discovered with the Land, the lessee shall immediately advise the Minister and the Territorial Archaeologist in writing.***

As required by NIRB Project Certificate No.008 Condition 55: ***The Proponent shall conduct archaeological surveys prior to land disturbance related to the Project and report survey results to applicable parties, including the Government of Nunavut – Department of Culture and Heritage. Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.***

And

As required by NIRB Project Certificate No.008 Condition 56: ***The Proponent shall report any archaeological site discovered during the construction, operation, and closure phases to the Government of Nunavut –***

Department of Culture and Heritage and the Kivalliq Inuit Association. Upon discovering an archeological site, the Proponent shall:

- ***a) Take all reasonable precautions necessary to protect the site until further direction is received from the Government of Nunavut – Department of Culture and Heritage; and***
- ***b) If it becomes necessary to disturb an archaeological site, the Proponent shall consult with the Government of Nunavut – Department of Culture and Heritage, the Kivalliq Inuit Association, and potential impacted communities to establish a site specific mitigation plan, and obtain all necessary authorizations and comply with all applicable laws.***

Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.

In 2018, archaeological impact assessments were conducted to identify sites that could potentially be impacted by the following future project components:

- Whale Tail Haul Road Quarry km 26.25 expansion;
- Baker Lake Fuel Storage Facility

The 2018 Tank Farm expansion field studies were conducted by truck/foot access and surface inspection. Ground reconnaissance included visual inspection to identify stone features such as tent rings, stone circles, caches, hearths, inuksuit, and graves, as well as historic items or prehistoric lithic artifacts. No areas with significant deposition were identified to warrant shovel testing. Shovel testing was not conducted at identified archaeological sites pending determination of potential impacts; Agnico Eagle plans to continue to avoid all identified archaeological sites.

Thirteen sites were investigated relative to the Meadowbank Project, all at the Baker Lake Tank Farm Expansion study area, including nine stone feature campsites of varying ages (some likely relatively recent), one cabin/campsite, one unknown site consisting of a recent use site (small partially buried box), and one prehistoric lithic scatter site. The thirteenth site investigated was a site revisit attempt; this site could not be re-identified during the current study nor was it re-observed during the 2010 visit by this report author. The site was originally reported in 1955, and the recorded location is likely incorrect.

As no site mentioned above cannot be avoided, no mitigative work was completed in 2018.

Before end of March 2019, Agnico Eagle will submit to the GN Cultural and Heritage department the 2018 Archaeological Site Status Report. This report and the information contained in it are confidential and therefore were submitted directly to the GN Cultural and Heritage department. Requests for information should be made directly to the GN.

8.21 CLIMATE MONITORING

8.21.1 Meadowbank Site

As required by NIRB Project Certificate No.004 Condition 21: ***shall fund and install a weather station at the mine site to collect atmospheric data, including air temperature and precipitation.***

During the technical meeting and pre-hearing conference held in Baker Lake on January 14 -15, 2015 regarding the NWB Water License renewal, CIRNAC mentioned that *climate data provide important input for interpreting site-specific geothermal aspects, such as the rate of mine waste freezeback and active* *layer thicknesses, for permafrost encapsulation of the mine wastes. In addition, the previous year's climate is useful for interpreting the hydrology and water balance for the site.*" It was recommended that the annual monitoring report summarize monthly climatic conditions at the Meadowbank site over a 12-month period. Table 8.114 includes average, minimum and maximum air temperatures, average and maximum wind speed as well as daily average, total and maximum volume of precipitation (rainfall / snowfall) on site. It should be noted that Agnico does not have a snow gauge but rather a rain gauge. For this reason, snow precipitations are reported as mm of rain.

In 2018, temperatures and winds recorded were similar to annual trends observed from 2009-2017. The coldest temperature was -35.09°C and warmest 12.77°C. The maximum wind speed recorded in 2018 was 25.44 m/s. The maximum wind speed recorded between 2008-2017 was 29.22 m/s in 2015. Total precipitation in 2018 (154.38mm) was lower than previous year: 2017 (268.35 mm) and 2016 (299.45 mm). Figure 15, 16 and 17 below show, respectively, the temperature average, wind speed average and total precipitation data from 2009-2018.

8.21.2 Whale Tail Site

The meteorological station at Whale Tail was in function for all of 2018. Table 8.115 includes average, minimum and maximum air temperatures and average and maximum wind speed. There is no rain gauge installed at Whale Tail to monitored rain/ snowfall.

In 2018, temperatures and winds recorded were similar to the data obtained for Meadowbank Site. The coldest temperature was -35.49°C and warmest 13.46°C and is similar to data obtained for Meadwobank. The maximum wind speed recorded was in March 2018 with 25.30 m/s compared to 25.44 m/s for Meadowbank..

Table 8.114 2018 Meadowbank Monthly climate data

Date	Temperature Average	Temperature Max	Temperature Min	Wind Speed Average	Wind Speed Max	Total Precipitation	Daily Average Precipitation	Max Precipitation
	°C	°C	°C	m/s	m/s	mm	mm	mm
January	-29.22	-16.82	-40.19	4.58	16.74	13.25	0.58	2.60
February	-35.09	-16.10	-46.55	4.42	14.88	3.00	0.25	0.70
March	-24.03	-12.63	-38.72	5.70	25.44	25.85	1.36	11.00
April	-21.04	-0.85	-32.57	5.83	21.76	4.65	0.24	1.63
May	-9.99	0.70	-22.97	6.39	18.95	7.90	0.49	1.90
June	4.00	18.86	-10.56	4.73	18.64	11.95	0.41	9.40
July	12.77	28.26	3.13	4.97	16.56	13.35	0.54	11.00
August	8.35	17.36	0.74	6.01	19.13	30.45	1.60	5.50
September	0.71	12.23	-7.35	5.92	16.13	20.25	1.01	4.50
October	-8.90	-1.26	-23.98	5.57	18.72	9.50	0.86	4.00
November	-22.66	-4.24	-33.99	3.97	18.21	10.03	0.72	3.80
December	-24.52	-8.19	-36.28	4.30	18.31	4.20	0.26	1.10
Total	NA	NA	NA	NA	NA	154.38	NA	NA

Table 8.115 2018 Whale Tail Monthly climate data

Date	Temperature Average	Temperature Max	Temperature Min	Wind Speed Average	Wind Speed Max
	°C	°C	°C	m/s	m/s
January	-29.65	-18.08	-38.85	4.93	20.40
February	-35.49	-17.91	-47.31	5.41	17.80
March	-24.73	-11.43	-39.62	6.56	25.30
April	-19.49	-1.043	-31.71	6.78	20.48
May	-9.74	1.17	-23.89	7.25	20.13
June	4.04	21.01	-12.12	5.68	21.38
July	13.46	29.89	2.07	5.71	18.25
August	7.85	18.31	0.11	6.32	19.62
September	0.13	13.40	-8.41	5.87	18.31
October	-9.65	-2.24	-25.65	6.17	21.44
November	-23.46	-5.27	-34.78	4.14	18.27
December	-25.16	-8.22	-36.88	5.68	20.66

Figure 22 – Meadowbank Site Temperature Average 2009-2018

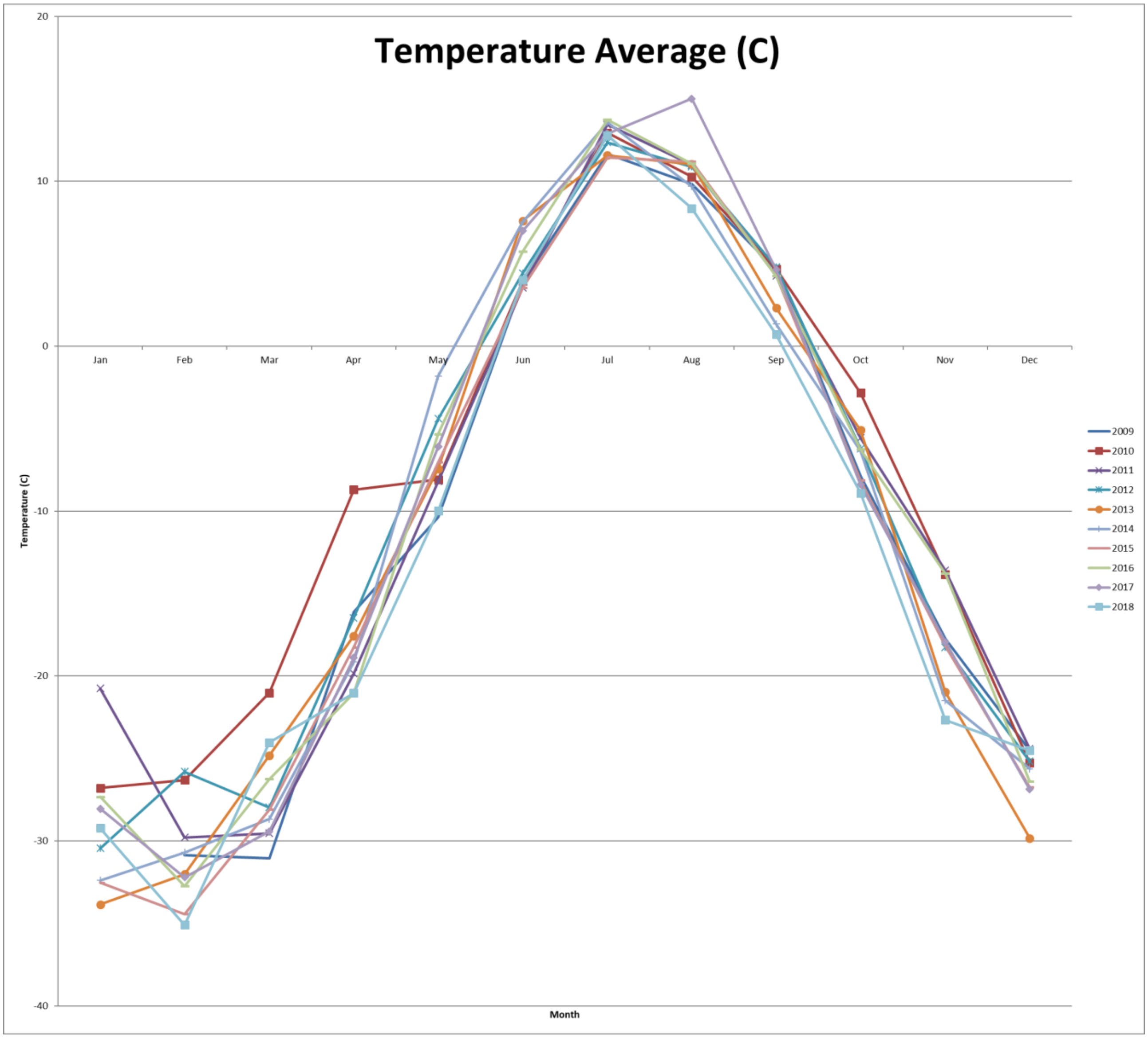


Figure 23 – Meadowbank Site wind speed average 2009-2018

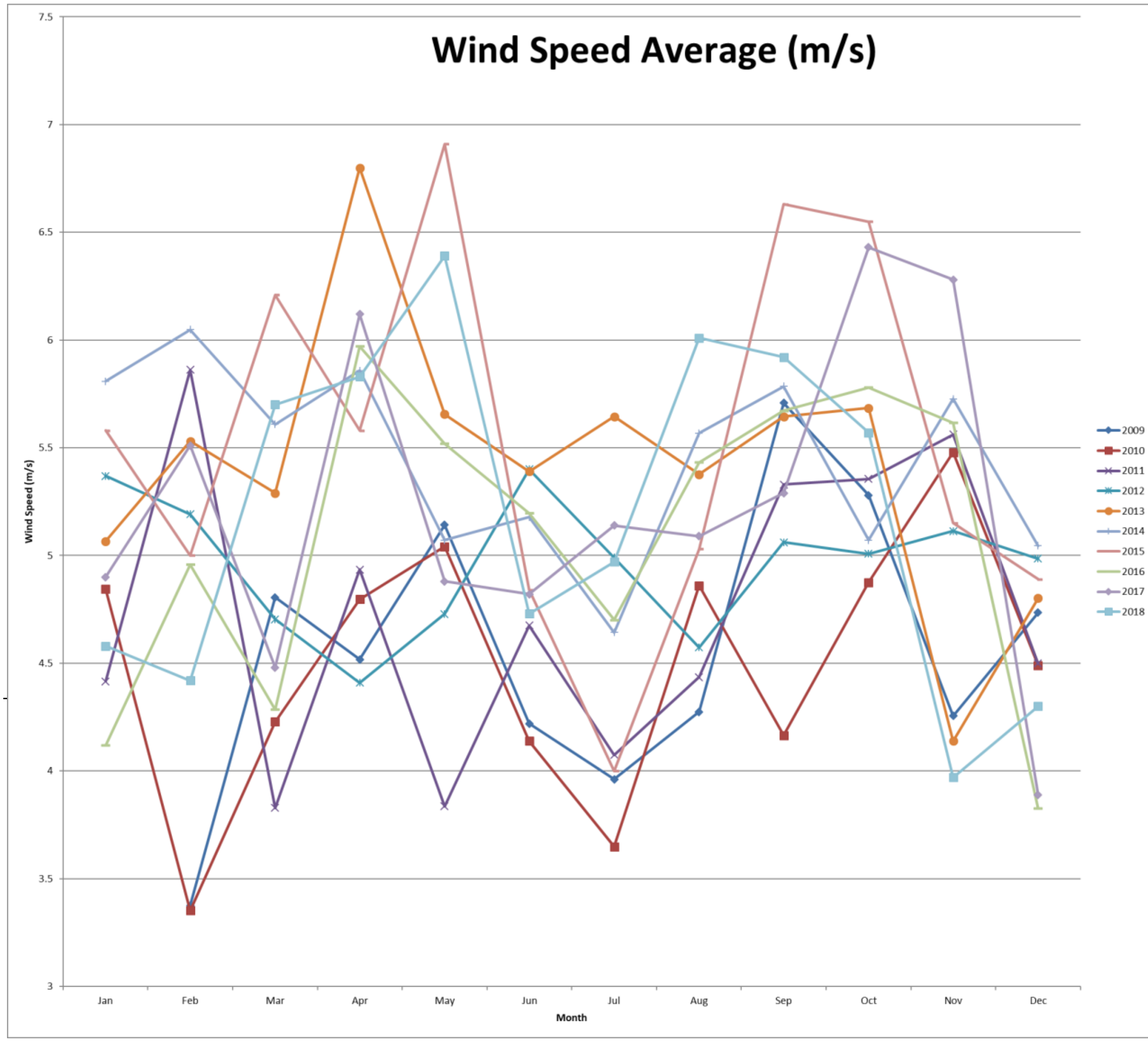
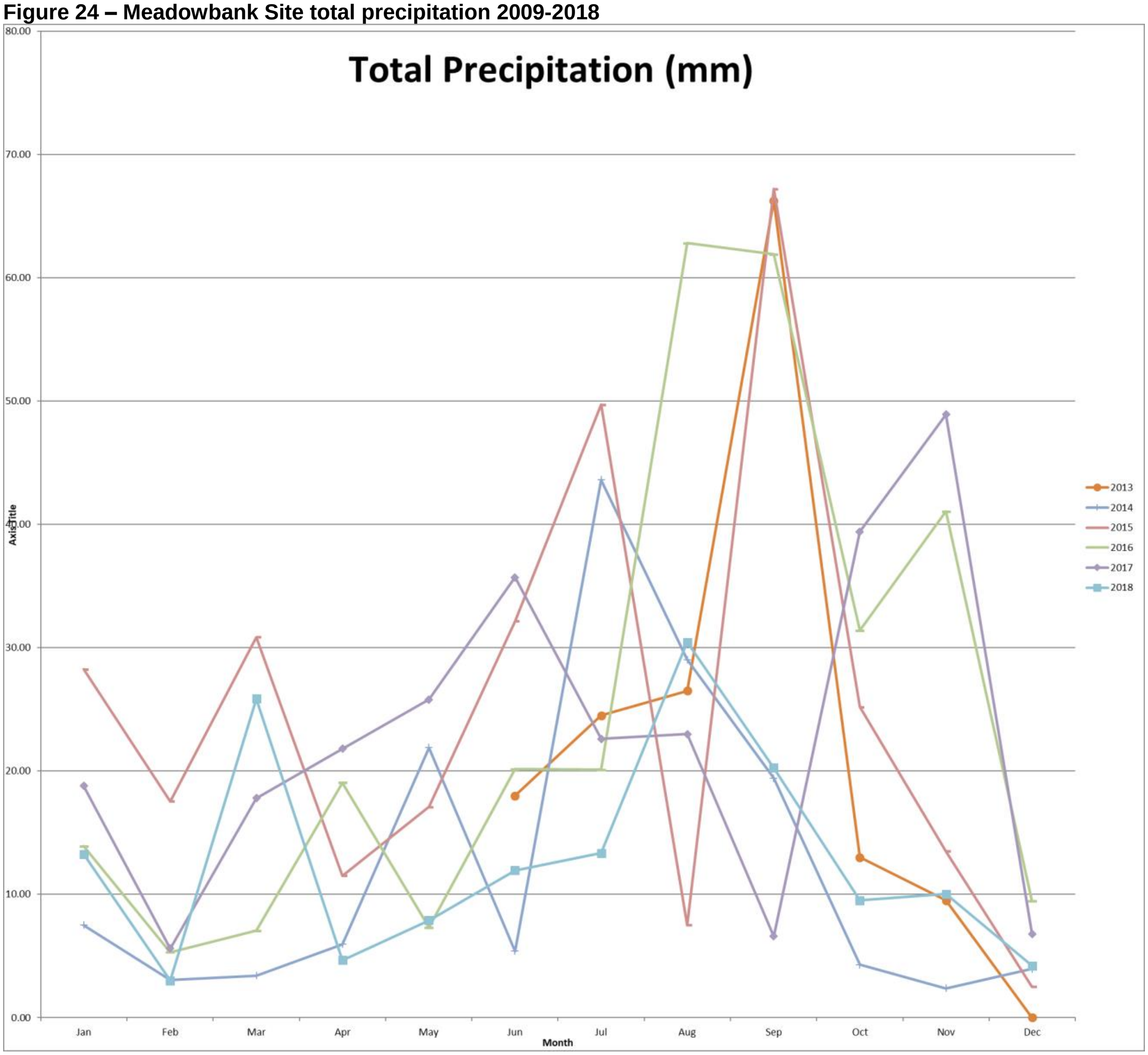


Figure 24 – Meadowbank Site total precipitation 2009-2018



SECTION 9. CLOSURE

9.1 PROGRESSIVE RECLAMATION

9.1.1 Meadowbank Site

9.1.1.1 Mine Site

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 17: ***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.***

And

As required by KIA KVPL08D280 Production Lease Condition 6.01 (9): ***Reclaim and remediate the Leased Land in accordance with the Closure and Reclamation Plan, on an ongoing basis through the Term and deliver to KIA, not later than March 31 of each year of the Term, beginning five years after the effective date, an amended C&R Plan detailing the activities taken in the last year and to be undertaken in the next year and planned for the balance of the Term, that includes, but is not limited to the proposed methods and procedures for progressive reclamation.***

Agnico submitted to NWB on August 22, 2018 the Meadowbank Interim Closure and Reclamation Plan (ICRP) - Update 2018 (Appendix 51) in accordance with discussions held with CIRNAC. Agnico was originally meant to submit a final closure plan in Q3 2017 as Meadowbank was targeted for closing in Q3 2018. Agnico received an agreement to push this to early 2018 if a positive determination from NIRB is received for the Whale Tail project, which was received in November 2017. Once the final approval for Meadowbank Tailings In-pit disposal is received, Agnico will update the ICRP.

The current mine plan includes progressive closure associated with the following mine components: Portage and Goose open pits, Portage Waste Rock Storage Facility, Tailings Storage Facilities, water management infrastructure, and site infrastructure (limited structures).

Best management practices, including progressive closure, have been incorporated in the Meadowbank operation period. The current mine plan includes progressive closure associated with the following components:

- Open pits;
- Portage RSF;
- Tailings Storage Facilities;
- Water management infrastructures.

The key closure activities that have been identified for progressive reclamation are detailed in the ICRP Section 6.2 for each individual component of the Project. The progressive reclamations activities provided in this ICRP will be updated in future versions of the plan to include new opportunities for progressive reclamation identified during operations.

Following the end of mining activities in Goose Pit in 2015, natural flooding started. No active pumping system is operating in Goose pit and part of the system has been decommissioned. From 2015 to the end of 2017, approximately 1,581,806 m^3 of water have flooded the Goose Pit. This volume includes natural flooding (run off water, seepage, groundwater) and also transfer from the downstream seepage of Central Dike. The reflooding of Goose Pit will be completed in accordance with the requirements of the Water License. Overall, progressive closure for the pits consists of decommissioning and removing the pumping systems and actively (and passively) reflooding the pits. The flooding of Portage, Vault and Phaser/BB Phaser pits are planned at the end of their operation in 2019-2020, while the Mill will still be processing ore from Whale Tail Pit and tailings deposition.

No progressive reclamation activities have been identified for the dikes and permanent structures this time. Dewatering structures are required for operations in the open pits and also to maintain the pits isolated during the flooding period and prior to opening the dewatering dikes. The TSF structures are required during operations to contain the tailings and will remain in place in the long term.

Closure and reclamation of the Portage RSF occurred progressively during operations with the placement of the NPAG cover over the side slopes of the PAG RSF. Refer to Section 5.2.5.4 of the ICRP (Appendix 51) for cover design details. Approximately 84% of the Portage PAG RSF has been covered as of the end of 2017. The RSF is designed for long-term stability. Thus no additional re-grading or construction will be required for stability. It will not be possible to progressively reclaim the uppermost bench or the top surface of the Portage RSF (PRSF) as the demolition landfill is located on the RSF. This will be completed in closure. Open pit backfill with waste rock also occurred during operations at Goose and Portage pits, in the mined out sectors. Finally, the RSFs containing NPAG waste rock will be reclaimed in operation or in active closure for closure construction requirements. The PAG rock portion of the PRSF has been capped, around the perimeter as the facility has risen, progressively, during operations with a 4m layer of NPAG rock to constrain the active layer within relatively inert materials. The control strategy to minimize the onset of oxidation and the subsequent generation of acid rock drainage includes freeze control of the waste rock through permafrost encapsulation and capping with an insulating convective layer of NPAG rock. The waste rock below the capping layer is expected to freeze, resulting in low rates of acid rock drainage (ARD) generation in the long term. Instrumentation has been installed in the PRSF to monitor the freeze back in the waste rock. Results to date from the thermistors indicate that freeze back is occurring in the PRSF structures, as described in Section 5.4.1 of this report. Monitoring will continue during operations and closure. The placement of the NPAG rock cover over the PAG rock has been progressively completed during operations and has been ongoing since 2012. As mentioned, there has been placement of a 4m NPAG rock cover over the exterior slopes, around the perimeter, as the PRSF is filled in lifts.

Progressive reclamation by capping the tailings in the North Cell was undertaken in winter of 2015 following the completion of the tailings deposition. Capping occurred in sections (perimeter areas) where the tailings were at elevation 149.5 m (design level). This consisted of capping with 2.0 m of NPAG material and represents 750,743 m^3 of placed material. Progressive closure in the North Cell continued in 2018 and is planned for 2019. Thermal modelling indicates that the tailings will freeze in the long term, and that the talik that currently exists below 2PL Arm will freeze before seepage from the TSF will reach the groundwater below the permafrost. The tailings are potentially acid generating (PAG); therefore a cover of NPAG material will be placed over the tailings to physically isolate the tailings and to confine the active layer within relatively inert materials. The control strategy to minimize water infiltration into the TSF and the migration of constituents out of the facility includes freeze control of the tailings through permafrost encapsulation. Refer to the Waste Rock and Tailings Management Plan in Appendix 17 for additional details on the tailings cover design for closure.

As part of the closure and reclamation planning, Agnico Eagle has undertaken a research program in collaboration with the RIME (Research Institute in Mine and Environment). The focus of this research program is the reclamation of the tailings storage and rock storage facilities. Test pads were constructed over the North Cell and instrumented to test various type of cover. As discussed in Section 5.4.1, the focus of this research program is the reclamation of the tailings storage and waste rock storage facilities. Refer to this section of the report for additional details on the research project.

As per the Meadowbank No Net Loss Plan (NNLP), compensation measures will have to be applied on site for closure. The NNLP quantifies the losses to fish habitat that will occur throughout the mine development and operational phase, and the gains that will be achieved through compensation measures. As part of the compensation measures, creation of fish habitat features within the mined out pits (Portage and Goose) is ongoing. The creation of fish reefs has been undertaken in the Central Portage Pit since the completion of mining. The construction of finger dikes in Third Portage Lake was initiated in 2016 to develop construction methods for these structures. The test was completed along Bay Goose dike at one location. The dikes faces (East Dike, Bay Goose Dike, South Camp Dike, Central Dike) are also considered as compensation features in the NNLP and have been completed during operations.

For more information regarding these activities, refer to the *Interim Closure and Reclamation Plan* – update 2018 found in Appendix 51.

9.1.1.2 AWAR

As required by CIRNAC 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 extensive progressive reclamation has been completed on the AWAR or associated quarries in 2018.

9.1.1.3 Quarries

As required by CIRNAC Land Lease 66A/8-72-5, 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 2018.

Before the construction of the landfarm facility at the mine site in 2012, contaminated soils from spills occurring on the AWAR were stored in Quarry 5 and 22 along the AWAR. In 2014, Agnico completed assessments in Quarry 5 and 22 to verify if the substrate where contaminated materials (with petroleum hydrocarbons (PHC"S)) were stored met CCME Remediation Criteria for Industrial use of Coarse Material. Quarry 5 was deemed remediated and details were provided in the 2014 Annual Report. Refer to Section 3.4.1.2 for more details regarding Quarry 22.

9.1.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Part J, Item 2: ***The Licensee shall submit to the Board for approval within twelve (12) months of Operations, an updated Interim Whale Tail Pit Closure and Reclamation Plan prepared in accordance with the "Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories", issued by the Mackenzie Valley Land and Water Board (MVLWB) and Aboriginal Affairs and Northern Development Canada (AANDC) in 2013 (MVLWB/AANDC 2013) and consistent with the INAC Mine Site Reclamation Policy for Nunavut, 2002. The Plan shall include all mine related facilities and Whale Tail Pit Haul Road.***

And

As required by NIRB Project Certificate 008 Condition 12: ***The Proponent shall provide a summary of its progressive reclamation efforts and associated feedback received from communities with respect to aesthetic values solicited by the Proponent as part of its public engagement processes in its annual reporting to the NIRB. As part of the Closure and Reclamation Plan, the Proponent shall develop and implement a program to:***

a) Progressively reclaim disturbed areas within the project footprint, with an emphasis on restoring the natural aesthetics of the area through re-contouring to the extent practicable; and

b) In a manner that demonstrates that the Proponent has considered the aesthetic values of local communities (e.g. information regarding the acceptability of the topography and landscape of the project areas following progressive reclamation efforts).

And

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 17: ***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.***

Agnico submitted the Whale Tail Interim Closure and Reclamation Plan on June 2016. There was no progressive reclamation completed in 2018 as the site was in construction. For details regarding the planned permanent and progressive reclamation, please refer to Section 5 et 6 respectively of the Whale Tail ICRP.

9.1.2.1 Mine Site

As required by KIA Commercial Lease KVCL314C01, Condition 6.01 (9) (4): ***A report of any reclamation work undertaken or required to be undertaken in accordance with this lease.***

No reclamation work undertaken at Whale Tail mine site in 2018. The site was in construction.

9.1.2.2 Whale Tail Haul Road

As required by CIRNAC Land Lease 66H/8-2-1, Condition 25: ***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.***

No reclamation work undertaken at along the Whale Tail Haul Road in 2018.

9.1.2.3 Quarries

As required by KIA Quarry Lease KVCA15Q02, Condition 14: ***AEM shall conduct reclamation activities until November 22, 2018, in accordance with the Reclamation Plan attached Schedule 3. AEM shall annually thereafter submit to KIA a Reclamation Plan detailing the proposed reclamation activities for the upcoming year.***

And

As required by KIA Quarry Lease KVCA18Q01, Condition 20: ***The permittee shall conduct reclamation activities during the first twelve months of the term of this Permit in accordance with the Reclamation Plan attached as Schedule 3. The permittee shall annually thereafter submit to the Association an Reclamation Plan detailing the proposed reclamation activities for the upcoming year.***

And

As required by KIA Quarry Lease KVCA17Q01, Condition 20: ***The permittee shall conduct reclamation activities during the first twelve months of the term of this Permit in accordance with the Reclamation Plan attached as Schedule 3. The permittee shall annually thereafter submit to the Association an Reclamation Plan detailing the proposed reclamation activities for the upcoming year.***

And

As required by KIA Quarry Lease KVCA15Q01, Condition 13: ***The permittee shall conduct reclamation activities during the first twelve months of the term of this Permit in accordance with the Reclamation Plan attached as Schedule 3. The permittee shall annually thereafter submit to the Association an Reclamation Plan detailing the proposed reclamation activities for the upcoming year.***

And

As required by CIRNAC Land Lease 66H/8-1-4, Condition 35: ***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.***

No restoration work was completed in 2018. Most of the quarries/eskers were used for the enlargement of the Whale Tail Haul Road.

9.1.3 Exploration Activity Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6i: ***A summary of drilling/trenching activities and progressive reclamation of drill/trench sites.***

And

As required by NWB Water License 2BB-MEA1828 Part B, Item 6k: ***A description of all progressive and or final reclamation work undertaken, including photographic records of site conditions before, during and after completion of operations.***

No reclamation work undertaken regarding exploration infrastructure in 2018.

At a drill site, the drill and the equipment are placed in a restrained area and will normally use less than 0.01 hectare. Cuttings generated by drilling are disposed of at a distance of at least 31 meters from a water body where a direct flow to the water is not possible. When drilling on ice, the cuttings generated is also disposed of at a distance of at least 31 meters from a water body using pumps and sludge lines or using settling tanks and transport. Once drilling is completed, the casing is then removed or cut off at ground level.

9.2 RECLAMATION COSTS

9.2.1 MEADOWBANK SITE

9.2.1.1 Project Estimate

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 19: ***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.***

Refer to Section 9.1.1 for the progressive reclamation discussion.

A permanent closure and reclamation financial security cost estimate has been prepared with the present Project layout and infrastructure. The cost estimate covers the closure and reclamation of all Project facilities as described in this report and was prepared using RECLAIM Version 7.0, March 2014, for permanent closure of the Project.

Reclamation of the Meadowbank Gold Project facilities can be divided into the following three general stages, as presented in the integrated schedule of closure activities presented in Appendix P of the ICRP:

- Operations: during which time progressive rehabilitation measures may be undertaken;
- Active Closure: during which time the major reclamation measures are undertaken;

- Post Closure: all major construction activities have been completed and ongoing monitoring and maintenance is required, with minimal activity on-site.

Agnico Eagle is required to submit a detailed financial security cost estimate for the Meadowbank ICRP - Update 2018 to CIRNAC and KIA to support land use and water licensing requirements. RECLAIM Version 7.0 workbook has been used for this estimate, as per the Guidelines for Closure and Reclamation Cost Estimates for Mines, issued by CIRNAC, Mackenzie Valley Land and Water Board and the Government of the Northwest Territories.

This cost estimate provides for the closure measures described in detail in the Meadowbank ICRP – Update 2018. Most closure activities will occur within the active closure period, from 2022 to 2024. The schedule of closure activities presented in Appendix P of the ICRP outlines the major closure measures and their expected timeline.

For the purpose of this financial security cost estimate, only progressive rehabilitation measures which have already been completed to date are considered in the calculations.

The updated 2018 estimated closure and reclamation costs for the Meadowbank Project represent a total of $ 83,569,898. This total includes $ 57,883,238 of direct costs and $ 25,686,660 of indirect costs. The financial security cost estimate assumptions and methodology used for the calculations, along with the complete RECLAIM 7.0 spreadsheets are presented in Appendix Q of the ICRP. For comparison between the 2018 and 2014 cost estimated, please refer to Table 5 of the ICRP Appendix Q.

Historically, a financial security cost estimate of the closure and reclamation activities for the Project, based on the current end of mine life configuration, was previously prepared using the RECLAIM template (Version 6.1, March 2009); details of this estimate are provided in Section 4.0, Appendix I1 and I2 of the closure plan found in Appendix H1 of the 2013 Annual Report. An update of the financial security cost presented in the Interim Closure and Reclamation Plan was prepared in December 2014 and is available in Appendix H1 of the 2014 Annual Report. The updated financial security cost estimate has been prepared using a more recent version of RECLAIM template (Version 7.0, March 2014). This updated closure cost was approved during the Type A Water License renewal process and forms part of the renewed Water License (July, 2015). The updated closure and reclamation cost estimate for the Meadowbank Gold Project using RECLAIM version 7.0 is $84,869,488. CIRNAC requested, during the Type A water license renewal process, that this amount be increased should Agnico be unable to take care of the closure and reclamation activities itself. Therefore, the agreed reclamation liability is $86,519,614.

Agnico Eagle has provided a Letter of Credit to the Government of Canada (CIRNAC) for C$71.1 million effective October 1, 2015 against site reclamation liability at Meadowbank for the mine plan. Agnico Eagle has also provided a Letter of Credit to the KIA for C$78,834.710 effective December 2015 against decommissioning and reclamation of the Mine site phase. Consequently, Agnico Eagle has posted Letters of Credit of a combined value of C$150,534,710 against reclamation liability at Meadowbank (174% of agreed estimated liability). On February 12, 2016 Agnico sent a request to the NWB to consider a change to the amount of security under the License to remove the overabounding. On June 6, 2016, NWB issue the Amendment no1 to the Water License 2AM-MEA1525. The amendment mentioned "furnish and maintain security with the Minister in the amount of $43,259,807. As set out in the Meadowbank Security Management Agreement, May 17, 2016, the amount secured under this Part constitutes 50% of the total global security amount of $86,519,614 that is required to reclaim the Undertaking and reflects that the other 50% of the global security amount will be held outside the License by the KIA, in accordance with the terms and conditions of the Meadowbank Security Management Agreement."

9.2.1.2 AWAR and Quarries

As required by CIRNAC 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 CIRNAC Land Lease 66A/8-72-5, 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 extensive progressive reclamation has been completed on the AWAR or associated quarries in 2018.

No major modifications were made in the last updated interim closure plan from 2018 compared to with the 2014 ICRP. The cost estimate for the reclamation of the AWAR and quarries in the 2018 ICRP cost estimated is C$993,078 with instead of C$991,072 in 2014 ICRP. The difference in cost is explained by Lump sum allowances of 4,000$ (instead of 10,000$ in 2014) per culvert removal and $25,000 per bridge removal is considered in 2018. Also, a total of 38 culverts and 9 bridges are considered for the AWAR in 2018, compared to 15 culverts and 9 bridges in 2014.

9.2.2 Whale Tail Site

9.2.2.1 Project Estimate

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 19: ***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 NWB Water License 2AM-WTP1826 Part C, Item 7: ***The Licensee shall, within twelve (12) months following the commencement of Operations and when the Licensee files a Final Reclamation and Closure Plan as required under the Licence, submit to the Board for review an updated reclamation cost estimate, using the INAC RECLAIM Reclamation Cost Estimating Model (Version 7.0 or the most current version in use at the time the updated reclamation cost estimate is submitted to the Board).***

Agnico submitted the Whale Tail Interim Closure and Reclamation Plan on June 2016. A permanent closure and reclamation financial security cost estimate has been prepared to a conceptual level with the present Project layout and infrastructure (Appendix D of the ICRP 2016).

The cost estimate covers the closure and reclamation of all Project facilities as described in the ICRP and was prepared using RECLAIM Version 7.0, March 2014, for permanent closure of the Project. The 2016 estimated closure and reclamation costs for the Whale Tail Project represent a total of C$19,831,405. This total includes C$8,544,799 of direct costs and C$11,286,606 of indirect costs. The cost estimated will be updated as par of the ICRP update to be submitted within twelve (12) months following the commencement of Operation.

As per NWB Water License Part C Item 1, Agnico has provided to both the Government of Canada (CIRNAC) and KIA a Letter of Credit in the amount of C$13,143,000 for a total of C$26,286,000.

9.2.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6h: ***An updated estimate of the current Meadowbank Advanced Exploration Project restoration and liability, as required under Part B, Item 2, based upon the results of the restoration research, project development monitoring, and any modifications to the site plan.***

Agnico submitted the Conceptual Closure and Reclamation Plan for Amaruq and Meadowbank Exploration Project on March 2016.

RECLAIM 7.0 was used in calculating the costs of reclamation and closure. The calculation of costs are conservative. It assumes no reliance on the Meadowbank Mine for services during closure, but does assume that the Meadowbank AWAR from the Meadowbank Mine to Baker Lake will remain available for use. Similarly, it is assumed that the exploration access road from Meadowbank to Amaruq will be used during reclamation and closure as it is scheduled to be completed in 2018. The exploration access road is under a separate Type B License and is therefore not included under the Amaruq Project reclamation and closure costs detailed below.

For RECLAIM purposes it is assumed that the total volume of waste rock to be reclaimed is 200,000 m^3, this representing the maximum volume stored on the operations pad following completion of the ramp. The quantity of ore, which is PAG, is a maximum of 8,000 m^3.

It is assumed that all the water in the storm water storage pond (4000 m^3) and in the quarry sump (1,000 m^3) will be pumped down the ramp after the portal cover is removed.

A summary of costs is provided in Tables 1 and 2 of the 2016 Conceptual Closure and Reclamation Plan for Amaruq and Meadowbank Exploration Project, respectively. Appendices A and B of the plan also provide more detail on the calculated closure costs for the two sites.

No cost estimates update was completed in 2018.

From the 2016 estimated, the cost estimate for the reclamation and closure of the Amaruq Exploration Site and amendment to include ramp, quarry and ancillary infrastructure is C$1,824,583. This total includes C$1,346,100 of direct costs and C$478,483 of indirect costs.

From the 2016 estimated, the cost estimate for the reclamation and closure of the Meadowbank Exploration Site is C$84,636. This total includes C$47,958 of direct costs and C$36,678 of indirect costs.

9.3 TOPSOIL/ORGANIC MATTER SALVAGE AND REVEGETATION

As required by NIRB Project Certificate 008 Condition 13: ***The Proponent shall explore the feasibility of topsoil/organic matter salvage as part of project development and provide updates to the Closure and Reclamation Plan based on this investigation. The Proponent shall provide a summary of its management of topsoil in annual reports to the NIRB.***

And

As required by NIRB Project Certificate No.008 Condition 26: ***The Proponent shall include revegetation strategies within its Mine Closure and Reclamation Plan that support progressive reclamation, and promote natural revegetation and recovery of disturbed areas compatible with the surrounding natural environment. These strategies should include exploration of the feasibility and practicality of topsoil/organic matter salvage through Project development. Consideration for the results of similar reclamation efforts at other northern projects, including the Meadowbank Gold Mine Project, must be demonstrated. Within three (3) years from the commencement of construction, information regarding the revegetation strategies developed and implemented by the Proponent in fulfillment of this Term and Condition shall be included in the Proponent's annual report to the NIRB. Subsequently, information regarding the Proponent's progress in fulfillment of this Term and Condition shall be provided annually in the Proponent's annual report to the NIRB.***

Natural revegetation is already promoted and include in the Whale Tail ICRP. As per the 2016 Whale Tail ICRP, active revegetation has not been planned at this time as part of the reclamation plan given the cold climate setting of the Project. Additional research on active revegetation may be considered in future iterations of the closure activities.

Agnico will therefore explore the feasibility of topsoil/organic salvage as part of the project development and will update the ICRP, as needed.

9.4 TEMPORARY MINE CLOSURE WHALE TAIL SITE

As required by NIRB Project Certificate No.008 Condition 47: ***The Proponent should undertake an analysis of the risk of temporary mine closure, giving particular consideration to how communities in the Kivalliq region may be affected by temporary closure of the mine, including consideration of the measures that can be taken to mitigate the potential for adverse effects (e.g. development of programs that provide transferable skills, identification of employment options that can include transfers amongst Agnico Eagle operations, etc.) This analysis is required to be updated as necessary to reflect significant changes to the Project or the socio-economic conditions in the region that may increase the risks and potential effects of temporary mine closures. This initial results of the Proponent's analysis should be provided to the Nunavut Impact Review Board (NIRB) within six (6) months of the issuance of the Project Certificate. Any updates to the analyses should be provided to the NIRB within three (3) months following completion of updated analyses by the Proponent.***

Agnico Eagle submitted the analysis of risk of temporary mine closure on September 11, 2018. There have not been any updates since the last submission. The Analysis of the Risk of Temporary Mine Closure is included in the Appendix 50 of this report.

9.5 SOCIO-ECONOMIC CLOSURE PLAN WHALE TAIL SITE

As required by NIRB Project Certificate 008 Condition 51: ***The Proponent shall develop a conceptual Socio-economic Closure Plan that:***

- ***Links the socio-economic closure plans for Meadowbank and Whale Tail;***
- ***Identifies regular update and multi-party review requirements;***
- ***Shows evidence of consideration of socio-economic lessons learned from other northern mine closure experiences;***
- ***Includes evidence of consultation with Kivalliq communities and governance bodies on socio-economic objectives/goals related to closure planning;***
- ***Emphasizes plans, policies, and programs to increase transferable skills of Inuit workers, including into trades and other skilled positions; and***
- ***Includes all plans, policies and programs related to socioeconomic factors in a temporary closure situation.***

The conceptual socio-economic closure plan will be provided to the Nunavut Impact Review Board within one (1) year of issuance of the Project Certificate, and updated as needed prior to closure with information provided in the Proponent's annual report to the Nunavut Impact Review Board.

The Conceptual Socio-Economic Closure Plan was be submitted to NIRB in March, 2019. It is included in the Appendix 52 of this report.

SECTION 10. PLANS / REPORTS / STUDIES

10.1 SUMMARY OF STUDIES

10.1.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 20: ***A summary of any studies requested by the Board that relate to Water use, Waste disposal or Reclamation, and a brief description of any future studies planned.***

No studies were requested by the NWB in 2018.

10.1.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 20: ***A summary of any studies requested by the Board that relate to Water use, Waste disposal or Reclamation, and a brief description of any future studies planned.***

No studies were requested by the NWB in 2018.

10.1.3 Exploration Activity Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6l: ***A summary of any specific studies or reports requested by the Board, and a brief description of any future studies planned or proposed.***

No studies were requested by the NWB in 2018.

10.2 SUMMARY OF REVISIONS

10.2.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Part B, Item 16: ***The Licensee shall review the Plans or Manuals referred to in this Licence as required by changes in operation and/or technology and modify the Plans or Manuals accordingly. Revisions to the Plans or Manuals are to be submitted in the form of an Addendum to be included with the Annual Report required by Part B, Item 2, complete with a revisions list detailing where significant content changes are made..***

And

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 21: ***Where applicable, revisions will be completed as Addendums, with an indication of where changes have been made, for Plans, Reports, and Manuals.***

As per Water License 2AM-MEA1526 Part B, Item 16 : 'The Licensee shall review the Plans or Manuals referred to in this Licence as required by changes in operation and/or technology and modify the Plans or Manuals accordingly. Revisions to the Plans or Manuals are to be submitted in the form of an Addendum to be included with the Annual

Report required by Part B, Item 2, complete with a revisions list detailing where significant content changes are made.' Plan will be considered as approved unless a notification from the NWB requested the formal approval process. Refer to Table 10.1 for a list of management plans approved by NWB.

The following monitoring and management plans were revised in 2018 and apply to Meadowbank Site:

- Mine Waste Rock and Tailings Management Plan, Version 8 (Appendix 17);
- Meadowbank Interim Closure and Reclamation Plan (ICRP) - Update 2018;
- Incinerator Waste Management Plan, Version 8;
- Landfill Design and Management Plan, Version 4;
- Tailings Storage Facility – Operation, Maintenance and Surveillance Manual, Version 9;
- Dewatering Dikes – Operation, Maintenance and Surveillance Manual, Version 8;
- 2018 Water Management Report and Plan (Appendix 8) including the Ammonia Management Plan and the Freshet Action Plan, Version 7;
- Groundwater Monitoring Plan, Version 8 (Appendix 37);
- Oil Handling Facility: oil Pollution Emergency Plan, Version 9.
- Baker Lake Bulk Fuel Storage Facility: Environmental Performance Monitoring Plan, Version 4;

The following monitoring and management plans were revised in 2018 and apply to both Meadowbank and Whale Tail sites:

- Air Quality and Dustfall Monitoring Plan, Version 4;
- Hazardous Materials Management Plan, Version 4;
- Blast Monitoring Plan, Version 3;
- Meadowbank and Whale Tail Bulk Fuel Storage Facility: Environmental Performance Monitoring Plan, Version 4;
- Terrestrial Ecosystem Management Plan, Version 6;
- Noise Monitoring and Abatement Plan, Version 3;
- Spill Contingency Plan, Version 7;
- Occupational Health and Safety Plan, Version 2;
- Quality Assurance / Quality Control (QA/QC) Plan, Version 4.

The above listed plans are included in Appendix 8, 17, 37 and 51. A brief description of revisions made to each of plans is provided in Appendix 53.

10.2.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Part B, Item 17: ***The Licensee shall review the Plans or Manuals referred to in this Licence as required by changes in operation and/or technology and modify the Plans or Manuals accordingly. Revisions to the Plans or Manuals are to be submitted in the form of an Addendum to be included with the Annual Report required by Part B, Item 2, complete with a revisions list detailing where significant content changes are made.***

And

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 21: ***Where applicable, revisions as Addenda, with an indication of where changes have been made, for Plans, Reports, and Manuals.***

And

As required by NIRB Project Certificate 008 Item 13: ***The Proponent is encouraged to provide on-going opportunities for consultation and comment on any substantive revisions to the Project-specific monitoring program, modelling, studies, management plans, management measures, and reporting under the Project Certificate.***

As per Water License 2AM-WTP1826 Part B, Item 16 : 'The Licensee shall review the Plans or Manuals referred to in this Licence as required by changes in operation and/or technology and modify the Plans or Manuals accordingly. Revisions to the Plans or Manuals are to be submitted in the form of an Addendum to be included with the Annual Report required by Part B, Item 2, complete with a revisions list detailing where significant content changes are made.' Plan will be considered as approved unless a notification from the NWB requested the formal approval process. Refer to Table 10.1 for a list of management plans approved by NWB.

The following monitoring and management plans were revised or submitted as first version in 2018 and apply to Whale Tail Project:

- Core Receiving Environment Monitoring Program (CREMP): 2015 Plan Update – Whale Tail Pit Addendum, Version 1;
- CREMP Addendum - Appendix A: Mercury Monitoring Plan for Whale Tail South Area, Version 2;
- Fish Habitat Offset Monitoring Plan, Version 1;
- Fish Habitat Offsetting Plan, Version 1;
- Groundwater Monitoring Plan, Version 2.1 (under NWB formal approval. CIRNAC has a confirm the updated plan comply with Project Certificate No.008)
- Operational ARD-ML Sampling and Testing Plan – Whale Tail Pit Addendum, Version 4;
- Operation and Maintenance Manual - Sewage Treatment Plant, Version 2;

- Operation and Maintenance Manuel Arsenic Water Treatment Plant, Version 2;
- Operation and Maintenance Manuel – Construction Water Treatment Plant, Version 1;
- Shipping Management Plan, Version 2;
- Water Management Infrastructures - Operation, Maintenance and Surveillance Manual, Version 1;
- Thermal Monitoring Plan, Version 2;
- Water Quality and Flow Monitoring Plan, Version 6;
- Erosion Management Plan, Version 1;
- Greenhouse Gas Reduction Plan, Version 1;
- Whale Tail Haul Road Management Plan, Version 2;
- Waste Rock Management Plan, Version 4;
- Blasting Activities – Whale Tail Dike construction, Version 1;
- Water Management Plan, Version 3.

The above listed plans are included in Appendix 51. A brief description of revisions made to each of plans is provided in Appendix 53. Some plans detailed in Section 10.2.1 above apply to both Meadowbank and Whale Tail sites. Refer to this section for more details.

The community also have the opportunity to comment and ask questions related to the project during the different public consultations detailed in Section 11.9.

10.2.2.1 Occupational Health and Safety Plan

As required by NIRB Project Certificate 008 Condition 57: ***The Proponent shall update its Occupational Health and Safety Plan to include sexual health and well-being information in its employee orientation programming. In addition, the Proponent shall undertake an education program to inform workers of the range of health services available onsite. The updated plan shall be provided to the Nunavut Impact Review Board (NIRB), once completed within six (6) months of issuance of the Project Certificate. Summaries of the education programs undertaken and any future updates or modifications to the Occupational Health and Safety Plan and the education program shall be included in the Proponent's annual report to the NIRB.***

Agnico submitted the updated Occupational Health and Safety Plan on December 14, 2018 to NIRB, which includes .

Agnico Eagle's education program on the range of health services on site includes:

- Introduction to clinic services on mandatory e-learning for all new employees;

- Presentation from clinic staff at Mandatory Training (also referred to as Site Readiness), which is the pre-employment program for Inuit;
- Visit to clinic during the general site orientation for all new employees;
- Dedicated bulletin board for health and wellness information; and
- General awareness communications: visits to departmental tool-box meetings, emails, Agnico TV, posters, brochures, etc.

For detailed information on programs, please refer to the annual Agnico Eagle's Kivalliq Projects Socio-Economic Monitoring Report, which will be submitted to NIRB on or by June 30, 2019. The updated Occupational Health and Safety Plan is included in the Appendix 51 of this report.

10.3 EXPLORATION ACTIVITY WHALE TAIL SITE

As required by NWB Water License 2BB-MEA1828 Part B, Item 6g: ***Any revisions to the Spill Contingency Plan, Water Management Plan, Waste Management Plan, Quarry Management Plan, Abandonment and Restoration Plan, as required by Part B, Item 12, submitted in the form of an Addendum***

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 16: ***The Licensee shall annually review the approved by accredited laboratory Quality Assurance/Quality Control plan and modify it as necessary. Proposed changes shall be submitted to an accredited laboratory for approval***

No management plans were updated in 2018 as per the Water License 2BB-MEA1828. The QAQC plan was reviewed but no updated was required. Last Version 1 January 2017 is still valid.

10.4 EXECUTIVE SUMMARY TRANSLATIONS

10.4.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 22: ***An executive summary in English, Inuktitut and French of all plans, reports, or studies conducted under this Licence.***

Appendix 53 includes an executive summary in English, French and Inuktitut for the following documents:

- All monitoring and management plans listed in Section 10.2.1 above.
- Reports or studies submitted in 2018 for Meadowbank site:
    - 2018 Annual Review of Portage and Goose Pit Slope Performance;
    - 2018 Independent Geotechnical Expert Review Panel Reports;
    - 2018 Landfarm Report;
    - 2018 Construction Season As-built Report Tailings Storage Facility;

  - Environmental Effects Monitoring: Cycle 3, Meadowbank Mine Interpretative Report;
  - In-Pit Tailings Deposition Thermal Modelling;
  - Meadowbank In-Pit Tailings Disposal - Thermal and Hydrogeological Modeling Update to Address NRCan's Comments
  - 2018 Q22 Report
  - 2019 Mine Plan;
  - 2018 Stack Testing Report.
- Reports or studies submitted in 2018 for both Meadowbank and Whale Tail sites:
  - 2018 Annual Geotechnical Inspection;
  - 2018 Wildlife Monitoring Summary Report;
  - 2018 Geotechnical Inspection Implementation Plan;
  - 2018 Marine Mammal and Seabird Observer (MMSO) Report;
  - 2017 Socio-economic monitoring Report;
  - Project Socio-Economic Monitoring Working Group – Term of Reference;
  - 2018 Groundwater Management Monitoring Report;
  - 2018 Core Receiving Environment Monitoring Program Report;
  - 2018 Blast Monitoring Report;
  - 2019 Mine Plan;
  - 2018 Air Quality and Dustfall Monitoring Report;
  - 2018 Noise Monitoring Report.

10.4.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 22: ***An executive summary in English and Inuktitut of all plans, reports, or studies conducted under this Licence.***

And

As required by NIRB Project certificate No.008 Condition 9: ***The Proponent shall make significant monitoring results and/or summaries of significant results available in English, Inuinnaqtun, and Inuktitut, to the extent feasible.***

And

As required by KIA Commercial Lease KVCA314C01 Condition 6.01 (9)(2): ***Copies of any communications, advice, documents, reports or other information on environmental matters submitted by the Tenant to any competent regulatory authority;***

And

As required by KIA Commercial Lease KVCA314C01 Condition 6.01 (9)(3): ***Copies of any environmental monitoring reports or environmental studies in respect of the Property, together with any interpretation or analysis of the date contained therein done by the Tenant or its agents or consultants.***

Appendix 52 includes an executive summary in English, French and Inuktitut for the following documents. A summary in Inuinnaqtum is also provide for reports or studies of interest.:

- All monitoring and management plans listed in Section 10.2.2 above.
- Reports or studies submitted in 2018 for Whale Tail site:
    - Literature review and preliminary study design for assessing fish habitat use in end pit lakes;
    - Hydrodynamic Modelling of Mammoth Lake;
    - Hydrodynamic modelling of Whale Tail Pit Lake;
    - Conceptual Socio-Economic Closure Plan;
    - Inuit Workforce Barriers Strategy (IWBS) Study;
    - Kivalliq Labour Market Analysis (KLMA);
    - Analysis of the Risk of Temporary Mine Closure
    - 2018 Independent Geotechnical Expert Review Panel Reports;
    - 2018 Mercury Monitoring Report;
    - 2018 Migratory Bird Protection Report;
    - Whale Tail Lake Fishout Report;
    - Whale Tail Site Specific Geotechnical Studies;

- 2018 Report on the Implementation and Monitoring of Measures to Mitigate and Avoid Serious Harm to Fish – Whale Tail Pit Project.
- 2018-2019 Commercial Lease Work Plan;
- 2019 Whale Tail Haul Road Work Plan;
- 2019 Quarry/Esker Work Plan.

Some reports detailed in Section 10.4.1 above apply to both Meadowbank and Whale Tail sites. Refer to this section for more details.

SECTION 11. MODIFICATIONS / GENERAL / OTHER

11.1 MODIFICATIONS

11.1.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 14: ***A summary of modifications and/or major maintenance work carried out on all water and waste related structures and facilities.***

In accordance with Water License 2AM-MEA1526, Part D, Item 14, Agnico submitted on December 14, 2018 a copy of the Central Dike, Saddle Dams 3 and North Cell Internal Structure Construction Summary Report 2018 (Appendix 13).

11.1.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 14: ***A summary of Modifications and/or major maintenance work carried out on all Water and Waste-related structures and facilities.***

The is no major modification to report on Whale Tail Site in 2018.

11.1.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part G Item 3: ***The Licensee shall provide as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modification. These plans and drawings shall be stamped by an Engineer.***

On March 28, 2018, Agnico Eagle submitted to NWB the as-built plans of the installation of the wastewater treatment system Newterra (Appendix 35) at the Exploration Camp.

11.2 MINE EXPANSION

As required by NIRB Project Certificate No.004 Condition 29: ***report to NIRB if and when [Cumberland] develops plans for an expansion of the Meadowbank Gold Mine, and in particular if those plans affect the selection of Second Portage Lake as the preferred alternative for tailings management.***

11.2.1 Meadowbank In-Pit Disposal Project

Agnico Eagle currently places all tailings at the Meadowbank Mine in the Meadowbank Tailings Storage Facility (within the former Second Portage Lake northwest dewatered arm), where tailings have been deposited sub-aerially as slurry and water from the ponds reclaimed during operation. Since mining began, Agnico Eagle has continued to evaluate alternative options for tailings deposition, in order to ensure that best practices are followed and to ensure appropriate long term planning to optimize the site footprint. In 2016, the Meadowbank Dike Review Board, an Independent Geotechnical Expert Review Panel established in accordance with Type A Water Licence 2AM-MEA1526, supported the use of early in-pit tailings disposal as an appropriate alternative in addition to current practices at Meadowbank Mine. Specifically, in-pit disposal of tailings has advantages with respect to health and safety, quality of life, water, air, capital cost, technology, natural hazards and adaptability. The Meadowbank Dike Review

Board accepted that in-pit disposal would be recognized as the best available technology. As a result, Agnico Eagle is now proposing to dispose of tailings in three pits, Portage Pit A, Portage Pit E, and Goose Pit, all within the footprint of the assessed and approved Meadowbank Mine.

The project was submitted to the NPC on December 21, 2017 and on March 22, 2018, the NPC issued a positive conformity determination. On March 22, 2018, the file was referred to the NIRB. A technical meeting was held on June 12, 2018; information requests were received on July 4; 2018, final written submissions were provided on August 2, 2018 and final concerns were received on August 20, 2018. On August 31, 2018 and November 27, 2018, Agnico Eagle received positive NIRB and ministerial decisions, respectively. Finally, a request to amend Water Licence 2AM-MEA1526 was submitted to the NWB on December 17, 2018.

As of December 31, 2018, this permitting regulatory phase is ongoing.

11.2.2 Whale Tail Pit Expansion Project

Agnico Eagle currently operates the Meadowbank Mine and is developing the Whale Tail Pit Project. Agnico Eagle is proposing to expand and extend the Whale Tail Pit Project to include:

- IVR Pit;
- IVR Waste Rock Facility;
- IVR Attenuation Pond;
- Underground mine;
- Groundwater storage pond system; and,
- Saline water treatment plant.

The project proposal was submitted to the NPC on October 15, 2018. On October 16, 2018, the review was completed stating that previous conformity determinations provided still apply for this project but as the project proposal is a significant modification, it requires screening by NIRB.

On November 23, 2018, the project was submitted to NIRB and following requests for additional information and documentation, Agnico Eagle submitted an updated Final Environmental Impact Statement on December 18, 2018. Positive conformity determination is still pending as of December 31, 2018.

11.2.3 Baker Lake Fuel Farm Expansion Project

As a result of ore hauling from the Approved Whale Tail Pit Project to Meadowbank, and the addition of a Power Plant and heating facilities at the Whale Tail site, diesel fuel needs have increased and calculations made prior to the Approved Project permitting process underestimated the requirements of fuel. To address the upcoming shortage, Agnico Eagle is proposing to add two (2) 10 million L diesel fuel storage tanks to the Marshalling Area Bulk Fuel Storage Facility in Baker Lake for a total of 80 million litres. Proposed infrastructures would be built starting in April 2019 pending all regulatory approvals have been received by then.

The project was submitted to the NPC on August 22, 2018. On August 28, 2018, the NPC referred Agnico Eagle to the positive conformity determination dated February 20, 2002 and referred Agnico Eagle to the NWB for further steps. On December 21, 2018, Agnico Eagle submitted a written notification to the NWB with regards to a planned modification to the Baker Lake Marshalling Area Bulk Fuel Storage Facility which is an approved facility under Water Licence 2AM-MEA1526. NWB's approval was still pending as of December 31, 2018.

11.3 EXLORATION WHALE TAIL SITE

11.3.1 Ongoing Exploration Programs

As required by NIRB Project Certificate No.008, Condition 64: ***Within its annual reporting, the Proponent is encouraged to include detailed updates on the status of ongoing exploration programs associated with the Project and associated implications for future phase developments of the Amaruq property. Status updates in fulfillment of this Term and Condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board.***

Diamond drilling and Rotary Air Blast (RAB) drilling completed by Agnico Eagle in 2018 on the Amaruq Property comprised delineation, exploration, conversion, geotechnical, and service targets. 2018 drill holes done on the Amaruq property resulted in an improved geological model and a better understanding of the regional geology, culminating with the expansion of the V2 zone at depth. This work was based out of the Amaruq exploration camp situated 50 kilometers north-northwest of the Meadowbank mine site. The drilling campaign totalled 404 diamond drill holes and 29 RAB drill holes totalling 85,566.5 meters. Particular attention was paid to the delineation drilling of the Whale Tail pit in the first phase of the 2018 drilling campaign. More conversion drilling of underground resources, extension drilling at depth and regional exploration drilling was undertaken later on in the drilling campaign.

11.3.2 2018 Drill Hole Location

As required by NBW Water License 2BB-MEA1828, Part J item 8:***The Licensee shall determine the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all drill holes located within thirty-one (31) metres of the ordinary High Water Mark, as per Part F, Item 2, and provide these locations on a map of suitable scale for review as part of the annual report.***

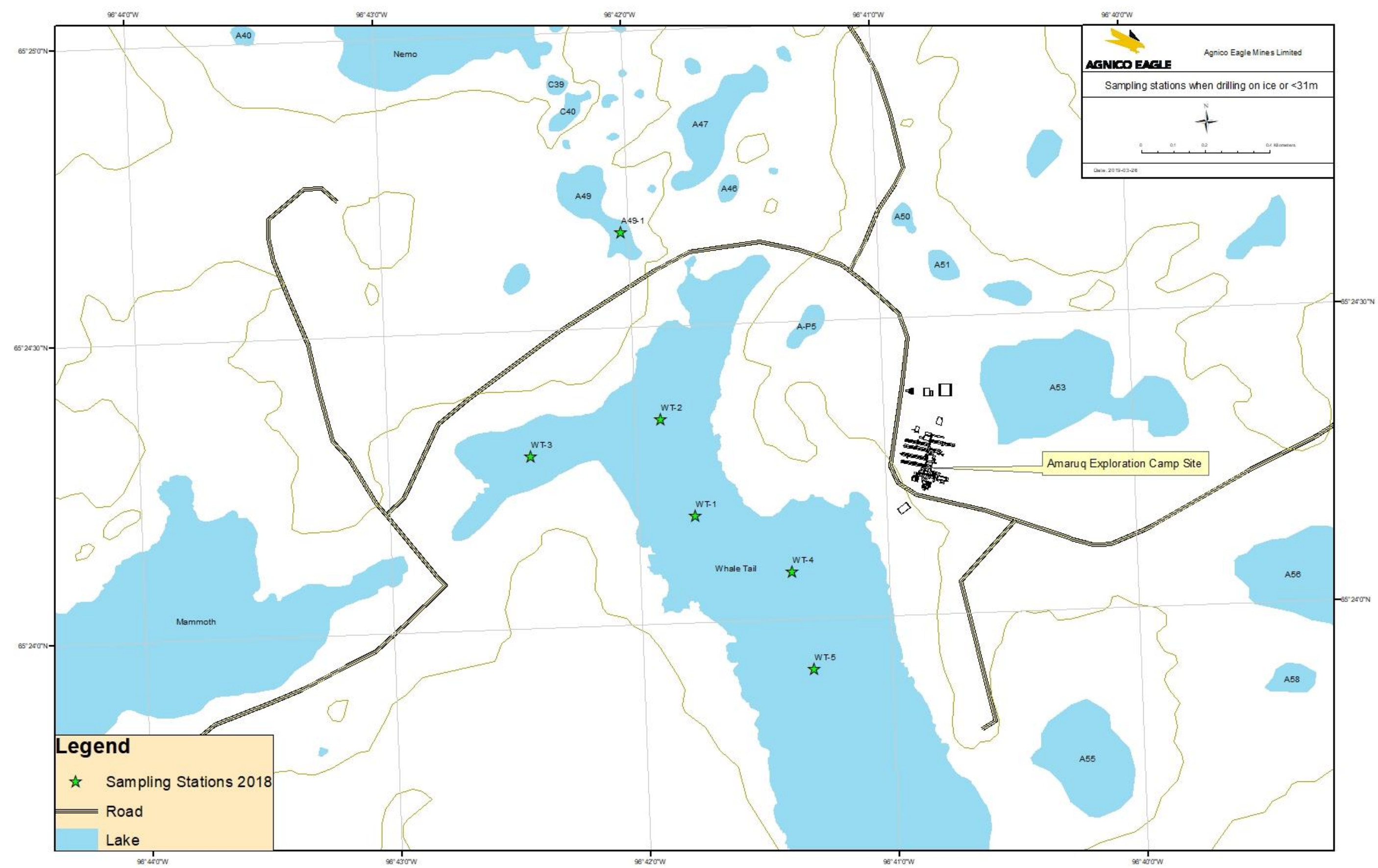
Table 11.1 and Figure 25 detailed the drill hole location for 2018 within the thirty-one meters of the High Water Mark.

Table 11.1. Whale Tail Exploration GPS co-ordinates for drill hole locations within thirty-one (31) metres of the High Water Mark

Names	X	Y
WT-1	606980.3	7255326.9
WT-2	606871.8	7255628.5
WT-3	606467.0	7255512.1

WT-4	607282	7255151
WT-5	607349	7254848
A49-1	606745.5	7256212.1

Figure 25. Whale Tail Drilling Within 31m of a Water Body



11.4 INTERNATIONAL CYANIDE MANAGEMENT CODE

As required by NIRB Project Certificate No.004, Condition 28: ***Cumberland shall become a signatory to the International Cyanide Management Code, communicate this to shippers, and do so prior to Cumberland storing or handling cyanide for the Project.***

In 2014 and 2015 audits and completion work were completed and assessed. A management of change process was implemented and put forward. From the status of Substantial Compliance in 2014, Agnico received full ICMC certification in March 2016.

As in previous years, a cyanide information brochure was made available to employees and the public. Copies are available at the Agnico Eagle's office in Baker Lake.

As per previous years shipments, the transport of cyanide in 2018 included a qualified nurse and an Emergency Response Team (ERT) member escorting the convoy of cyanide up to the Meadowbank mine site. In addition, they were present at the Baker Lake Marshalling facility for the removal of cyanide from the barge and the loading of the tractor trailers for hauling. As well, the road was completely closed for other traffic during cyanide transportation. In 2018, only one convoy of cyanide was needed during the barge season.

Recertification was initiated in 2018 to ensure Agnico maintains it's compliance with ICMI requirements. A full third-party audit was performed from June 21st to 28th 2018. Full recertification was received on January 15th 2019. The full certification information can be found at :

https://www.cyanidecode.org/sites/default/files/pdf/AgnicoEagleMeadowbankMineSAR2019.pdf

11.5 INSPECTIONS AND COMPLIANCE REPORTS

11.5.1 Meadowbank, Whale Tail and Exploration

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 23: ***A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector.***

And

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 23: ***A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector.***

And

As required by KIA Commercial Lease KVCA314C01 Condition 6.01 (9)(1): ***Information respecting the Tenant's compliance with the terms of this lease and any permits or licences required in respect of its Operations on the Property, together with details of any incidents of non-compliance, the results of any inspection reports prepared by or fines levied by any competent regulatory authority and any remedial action relating thereto***

11.5.1.1 Transport Canada

Transport Canada conducted an inspection of the Oil Handling Facility in Baker Lake on August 3rd during the fuel transfer. The inspection was to ensure compliance with the following Act, Regulations, Standards and Guidelines:

- Canada Shipping Act, 2001 (CSA 2001) as well as applicable regulations, standards and guidelines.
- Applicable Regulations, Standards and Guidelines:
- •Response Organizations and Oil Handling Facilities Regulations
- •Environmental Response Arrangement Regulations

- Vessel Pollution and Dangerous Chemicals Regulations (Part 2- Subdivision 5;Part 3 – Pollution
- Discharge Reporting)
- •Oil Handling Facility Standards (Transport Canada Publication TP 12402E)
- •Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants (Transport Canada Publication TP 9834E)

Find below some items that have been reviewed during the inspection:

- Revision of plans;
- Pressure test document for fuel lines;
- Employee training for pollution responses and transfer operations;
- Transfer procedure; and
- Pollution response equipment condition.

For the complete list of items that has been reviewed during the inspection, refer to the Appendix 54. No report was received from Transport Canada following the inspection.

11.5.1.2 ECCC and CIRNAC

On August 28th to 30th 2018 an inspection was conducted on the Meadowbank Site and Whale Tail Site by ECCC and CIRNAC.

Purpose of this visit was to conduct an inspection of the Baker Lake, Meadowbank Site and Amaruq/Whale Tail Site for any non-compliance under Environment Canada's inspector jurisdiction (fishery act, MDMER, E2, NPRI) and CIRNAC for water compliance and to review relevant documents of interest.

Overall, there were no major concerns noted. No inspection report was provided by ECCC. Inspection reports were received by the CIRNAC's Inspector. Find below a summary for each inspection reports:

Water Licence 2AM-MEA1526 : No non-compliance was noted during the inspection. Some documents was requested during the visit and the information have been provided. The inspector however requested to receive updates with major milestones at the Meadowbank site.

Water Licence 2BB-MEA1828: No major concern during the inspection. Few minor observations were noted.

- Some small hydrocarbon/grease stains around the white maintenance building was observed during the inspection. They were removed and disposed of in accordance with the approved management plans

- The Inspector was concerned with the possibility of the saline water leaching prior to treatment from AP5 and entering nearby waters. Information regarding the design of AP5 and the pump rate to AP5 were requested during the inspection to help determine if there is any seeping of water.
- Signs labeling all discharge points must be obtained and installed throughout the entire site.

Water Licence 2AM-WTP-1826: Overall, there were no concerns noted with any aspects of the Whale Tail construction. Agnico was requested to inform the Officer of the major milestones achieved during the construction of the project.

The complete inspection reports can be found in Appendix 54.

11.5.1.3 Kivalliq Inuit Association

KIA conducted the seasonal surface sampling inspection at Meadowbank and Whale Tail in July and September. Agnico did not receive any follow up report or sample results in 2018.

11.5.1.4 Nunavut Impact Review Board

Annual NIRB inspection of the Meadowbank and Whale Tail site was conducted from August 14th to August 16th Agnico received the Nunavut Impact Review Board's 2017-18 Annual Monitoring Report for the Meadowbank Gold Project (Project Certificate No. 004) and the Whale Tail Pit Project (Project Certificate No. 008) with Board's Recommendations.

Find below a list of the main subjects that were discussed in the report:

Meadowbank Gold Project

- Spill Management;
- Placement of local area marine monitors;
- Participation in Surveys;
- Suppression of surface dust;
- Air Quality;
- Appendix D, the Annual Report and the PEAMP;
- Aquatic Environment; and
- Noise Quality Monitoring.

Whale Tail Project

- Dust Management and Monitoring Plan;
- Site-specific Permafrost Monitoring, Mapping and Thermal Analysis;
- Invasive Species Mitigation Plans;
- Finalized Terms of Reference;
- Initial Listing of Formal Certificates and Licences;
- Occupational Health and Safety Plan; and
- Viability of flooded South Basin as an effective offset for habitat loss.

Responses have been submitted on December 14th to address the recommendations. Report and responses can be found in Appendix 54.

11.5.1.5 Government of Nunavut – Conservation Officer

- GN Conservation Officer conducted a wildlife inspection at Meadowbank from February 27th to March 1st.
- GN Conservation Officer Visit at Meadowbank and Whale Tail for a combined site tour inspection on November 22th to ensure that good practice wildlife management are followed;
- GN Conservation Officer on site December 18th to located a caribou collar on the Whale Tail Haul Road;

11.5.1.6 DFO

DFO did not conduct any site inspections at Meadowbank and Whale Tail in 2018.

11.6 NON-COMPLIANCES ISSUES

11.6.1 Meadowbank Site

As required by NIRB Project Certificate No.004 Condition 4: ***Take prompt and appropriate action to remedy any noncompliance with environmental laws and regulations and/or regulatory instruments, and shall report any noncompliance as required by law immediately and report the same to NIRB annually.***

In 2018, all water quality results complied with Water License and MDMER authorized limits.

In addition, results from Incinerator stack testing, incinerator ash testing and waste oil testing complied with the applicable regulatory and guideline criteria. All results can be found in Section 6.2.

11.6.2 Whale Tail Site

As required by NIRB Project Certificate No.008 Condition 6: ***The Proponent shall take prompt and appropriate action to remedy any occasion of non-compliance with environmental laws and regulations and/or regulatory instruments, and shall report any non-compliance as required by law immediately. A description of all instances of non-compliance and associated follow up is to be reported annually to the NIRB.***

In 2018, all water quality results complied with Water License and MDMER authorized limits.

11.6.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6f: ***A list of unauthorized discharges and a summary of follow-up actions taken***

Please refer to Section 7.1 for a summary of spill and to Section 8.5.4.3 regarding the 2018 exceedances related to the Waste Water Treatment System.

11.7 AWAR / WHALE TAIL HAUL ROAD USAGE REPORTS

11.7.1 Authorized and Unauthorized Non-Mine Use

11.7.1.1 AWAR Meadowbank Site

As required by NIRB Project Certificate No.004 Condition 32g: ***Record all authorized non-mine use of the road, and require all mine personnel using the road to monitor and report unauthorized non-mine use of the road, and collect and report this data to NIRB one (1) year after the road is opened and annually thereafter.***

And

As required by NIRB Project Certificate No.004 Condition 33: ***Cumberland shall update the Access and Air Traffic Management Plan to: 1. Include an All-weather Private Access Road Management Plan, including a right-of-way policy developed in consultation with the KivIA, GN, INAC and the Hamlet of Baker Lake, for the safe operation of the all-weather private access road; and 2. To facilitate monitoring of the environmental and socio-economic impacts of the private road and undertake adaptive management practices as required, including responding to any concerns regarding the locked gates.***

The security department at the Meadowbank Gold Project maintains fully staffed security gatehouse at Baker Lake on a 24/7 schedule. The Security staff monitors the safety, traffic and security of all personnel and the public using the road. Agnico procedures for non-mine uses of the road require that any local users report to the Baker Lake Gatehouse and sign a form that describes the safety protocol while on the road. The road is used primarily by local hunters using ATV's and snowmobiles. Daily records are kept. A summary of the non-mine authorized road use for 2018 is provided in Table 11.2. In 2018, 1,091 non-mine authorized road uses were recorded. This is lower than previous year and Agnico do not have any explanation regarding this less usage. Table 11.3 below show the ATVs and snowmobiles usage from 2012-2018. In 2018, no incidents involving non-mine authorized use occurred. Agnico is confident that the current procedures and protocols provide for the safety of the local public while using the road either for hunting access or for general recreational opportunities.

Table 11.2 2018 Monthly AWAR ATVs and Snowmobile Usage Records

Month	# of ATV's
January	2
February	0
March	0
April	0
May	7
June	157
July	157
August	306
September	294
October	157

November	11
December	0
Total 2018	1,091

Table 11.3 2012-2018 AWAR ATVs and Snowmobile Usage Records

Year	# of ATV's
2012	1,456
2013	1,958
2014	1,319
2015	2,366
2016	1,504
2017	1,715
2018	1,091

Agnico's Project Certificate 004 was issued in 2006. Following the approval of the All Weather Access Road (AWAR) in 2007, the Project Certificate was revised in 2009 to address concerns regarding access to the AWAR. Pursuant to condition 33, Agnico prepared the Transportation Management Plan: All weather Private Access Road in 2009. It was submitted and later approved by CIRNAC and GN. Therefore no revision of the 2005 Access and Air Traffic Management Plan was undertaken. Agnico is of the opinion that the Transportation Management Plan replaced the Access and Air Traffic Management Plan in 2009. The AWAR Transportation Management Plan was last updated in March 2017 and can be found in Appendix I1 of the 2016 Annual Report.

11.7.1.2 Whale Tail Haul Road

As required by NIRB Project Certificate No.008, Condition 31: ***The Proponent shall develop and implement a Road Access Management Plan and maintain traffic monitoring logs along the haul road between the Whale Tail Pit project and the Meadowbank mine. Where traffic exceeds levels predicted within the Environmental Impact Statement, the Proponent shall develop and implement appropriate modifications to its wildlife protection measures. The Road Access Management Plan shall be provided to the Nunavut Impact Review Board (NIRB) 90 days prior to operations commencing. An annual summary of the monthly maximum, minimum and average traffic levels shall be provided to the NIRB in the Proponent's annual report.***

And

As required by CIRNAC Road lease 66H/8-2-1 Condition 60: ***The lease shall before the first (1st) day of September in each and every year during the term of the lease, provide to the Minister, a report of that years road activities. The report shall include, but not limited to:***

(a) total number of loads hauled in that year

(b) total road operating cost for that year

And

As required by CIRNAC Road lease 66H/8-2-1 Condition 63: ***The lessee agrees to monitor and report unauthorized non-mine use of the road, and collect and report this data to the Minister, who shall make this report accessible to the Nunavut Impact Review board, one (1) year after the road is opened and annually thereafter.***

Agnico has provided and implemented the Whale Tail Haul Road Management Plan to meet Condition 31 of the NIRB Project Certificate No. 008 and Water License requirement. The Security staff monitors the safety, traffic and security of all personnel using the road. Table 11.4 below shows the traffic data for 2018 along the Whale Tail Haul Road. The data does not include the traffic data for light truck as there were no dispatch personnel in 2018 . Starting in February 2019, road dispatchers were engaged and will recorded all the traffic data along the road (for all type of vehicles/truck). A comparison to the EIS will be conducted in 2019 and appropriate modifications to the wildlife protection measures will be added if needed.

There is no non-mine uses of the Whale Tail Haul Road by any local as the road is close for public use. Two traditional land use crossing locations were identified during IQ/TK workshops and following meetings with the Hunters and Trappers Organization (HTO). A first location has been set at km 127 and is currently functional. More locations for Traditional Land Use Crossings will be identified in collaboration with the HTO. Haul traffic from the Whale Tail Pit to Meadowbank Mill will have the right-of-way. Traditional land users (i.e. hunters on ATVs or snowmobiles) crossing the Whale Tail Haul Road on identified ramps must yield to Haul Road Traffic; Haul Road Traffic approaching traditional land use crossings must be vigilant of the potential use by ATVs or snowmobiles. This intersection has a stop sign on the traditional land use crossing locations to give way to the mine haul trucks. Hunters and traditional land users on snowmobiles or ATVs have to stop, look both ways and yield to traffic before crossing the road. Traditional land use marked signs were installed on the haul road to warn haul trucks and other vehicles on the road to ensure users protection and safety of traditional land users on ATVs or snowmobiles. In 2018, no incidents involving non-mine authorized use occurred. Agnico is confident that the current procedures and protocols provide for the safety of the local public while using the road either for hunting access or for general recreational opportunities.

Table 11.4 2018 Whale Tail Haul Road Traffic Data

Month	Meadowbank to Whale Tail*	Whale Tail to Meadowbank*	Fuel Meadowbank to Whale Tail (40,000L tanker)	Total
January	50	15	16	**81**
February	27	25	23	**75**
March	31	22	17	**70**
April	25	16	14	**55**
May	13	7	17	**37**
June	48	23	23	**94**

July	84	14	17	**115**
August	129	1	28	**158**
September	33	115	33	**181**
October	0	86	36	**122**
November	124	1	50	**175**
December	2	0	40	**42**
Total	**566**	**325**	**314**	**1205**

*Include hauling of seacans (20 and 40 feet) and miscellaneous material

11.7.2 Safety Incidents

11.7.2.1 AWAR Meadowbank Site

As required by NIRB Project Certificate No.004Condition 32e: ***Prior to opening of the road, and annually thereafter, advertise and hold at least one community meeting in the Hamlet of Baker Lake to explain to the community that the road is a private road with non-mine use of the road limited to approved, safe and controlled use by all-terrain-vehicles for the purpose of carrying out traditional Inuit activities.***

And

As required by NIRB Project Certificate No.004 Condition 32f: ***Place notices at least quarterly on the radio and television to explain to the community that the road is a private road with non-mine use of road limited to authorized, safe and controlled use by all-terrain-vehicles for the purpose of carrying out traditional Inuit activities.***

And

As required by NIRB Project Certificate No.004 Condition 32h: ***Report all accidents or other safety incidents on the road, to the GN, KivIA [KIA], and the Hamlet immediately, and to NIRB annually.***

On December 18th, 2018, Agnico held a meeting in the Hamlet of Baker Lake to explain to the community the Policies and Procedures of the All Weather Access Road from Baker Lake to the Meadowbank Mine site. Additionally, at the suggestion of community members in 2017, Agnico held an AWAR safety meeting specifically for youth on May 22nd, 2018. Agnico also conducts quarterly meetings with the Baker Lake Community Liaison Committee and issues related to the use of the AWAR are discussed regularly.

No incident involving non-mine authorized use occurred in 2018.

There have been no accidents to date involving mine related truck traffic and locals using ATV's/snowmobiles.

A total of three (3) environmental spills occurred along the AWAR in 2018. Table 7.2 and 7.3 provides details on each of these spills. All spills were managed appropriately according to Agnico's spill contingency plan. The spills were remediated and contaminated material was deposited at the Meadowbank Landfarm. There were no impacts to any watercourses.

In 2018, there was only two (2) mortality project-related along the AWAR. Both were arctic hare mortalities. Three (3) caribou were reported dead along the AWAR. Some of the cause are unknown or wolf kill. One (1) caribou and one (1) wolf were reported sick or wounded along the AWAR and one (1) caribou was hit by a snow plow but the dead animal was never found (appears to have survived). All the incident/mortality reports can be found in 2018 Wildlife Report (Appendix 45 2018 Annual Report). To continue to avoid further incidents, messages are continually provided to employees and contractors to reinforce the procedures for wildlife protection during road use. As well, reminders were given on reporting any issues or observations concerning wildlife to the AWAR road dispatch.

11.7.2.2 Whale Tail Haul Road

As required by CIRNAC Road lease 66H/8-2-1 Condition 64: *The lessee agrees to report any information received, including accidents or others safety incidents on the road, including the locked gates, to the minister, who shall make this information accessible to the GN, KIA a, the Hamlet of Baker Lake immediately.*

There was no specific meeting held regarding the security along the Whale Tail Haul road in 2108 as the road is not open to public. This will be added to the annual meeting held for the Meadowbank AWAR.

No incident involving non-mine authorized use occurred in 2018.

There have been no accidents to date involving mine related truck traffic and locals using ATV's/snowmobiles.

A total of thirteen (13) environmental spills occurred along the Whale Tail Haul Road and eleven (11) in eskers/quarries along the road in 2018. Table 7.4 and 7.5 provides details on each of these spills. All spills were managed appropriately according to Agnico's spill contingency plan. The spills were remediated and contaminated material was deposited in roll-off containment on Whale Tail Site before disposal at the Meadowbank Landfarm. There were no impacts to any watercourses.

In 2018, there was only two (2) mortality project-related along the Whale Tail Haul Road. Both were arctic hare mortalities. Two (2) caribou were reported dead along the haul road and due to wolf kill.. All the incident/mortality reports can be found in the 2018 Wildlife Report (Appendix 45 2018 Annual Report). To continue to avoid further incidents, messages are continually provided to employees and contractors to reinforce the procedures for wildlife protection during road use. As well, reminders were given on reporting any issues or observations concerning wildlife to the Whale Tail Haul Road dispatch.

11.7.2.2.1 Road Closure

As required by CIRNAC Road lease 66H/8-2-1 Condition 65*: The lessee shall give notice of any closure of the road to the Minister and the reasons thereof, and post any notice of closure at the access point and along the road.*

There was no Whale Tail Haul Road closure in 2018 that may impact the local usage as the road is not public. There were road closures due to bad weather at various intervals throughout the year. When this situation occurred, the road status was provided to all Agnico and contractor's employees with regulars update. No incident related to bad weather were reported.

11.8 SHIPPING MANAGEMENT

As required by NIRB Project Certificate No.008, Condition 37: ***The Proponent shall maintain a Shipping Management Plan in coordination and consultation with applicable regulatory authorities and the Kivalliq Inuit Association, and the Hunters and Trappers Organizations of the Kivalliq communities. The updated plan should be submitted to the Nunavut Impact Review Board at least 90 days prior to the start to commencement of shipping activities, with subsequent updates submitted annually thereafter in the Proponent's annual report or as may otherwise be required by the NIRB.***

Agnico has developed and maintained a Shipping Management Plan (Version 1, April 2018) in advance of the 2018 shipping activities. The plan is provided in Appendix 51.

11.8.1 Marine Shipping Routing

As required by NIRB Project Certificate No.008 Condition 38: ***The Proponent shall ensure that marine shipping activities avoid sensitive wildlife habitat and species along the shipping route and use a routing south of Coats Island as the primary shipping route, subject to vessel and human safety considerations. Confirmation that the requirements of this term and condition are being effectively implemented by shipping companies contracted by the Proponent should be submitted as part of annual reporting to the Nunavut Impact Review Board.***

And

As required by NIRB Project Certificate No.008 Condition 39: ***The Proponent shall ensure that, subject to vessel safety requirements, a setback distance of at least 500 metres is maintained from colonies and aggregations of seabirds and marine mammals during Project shipping transiting through Hudson Strait, Hudson Bay, and Chesterfield Inlet. Confirmation that the requirements of this term and condition are being effectively implemented by shipping companies contracted by the Proponent should be submitted as part of annual reporting to the Nunavut Impact Review Board.***

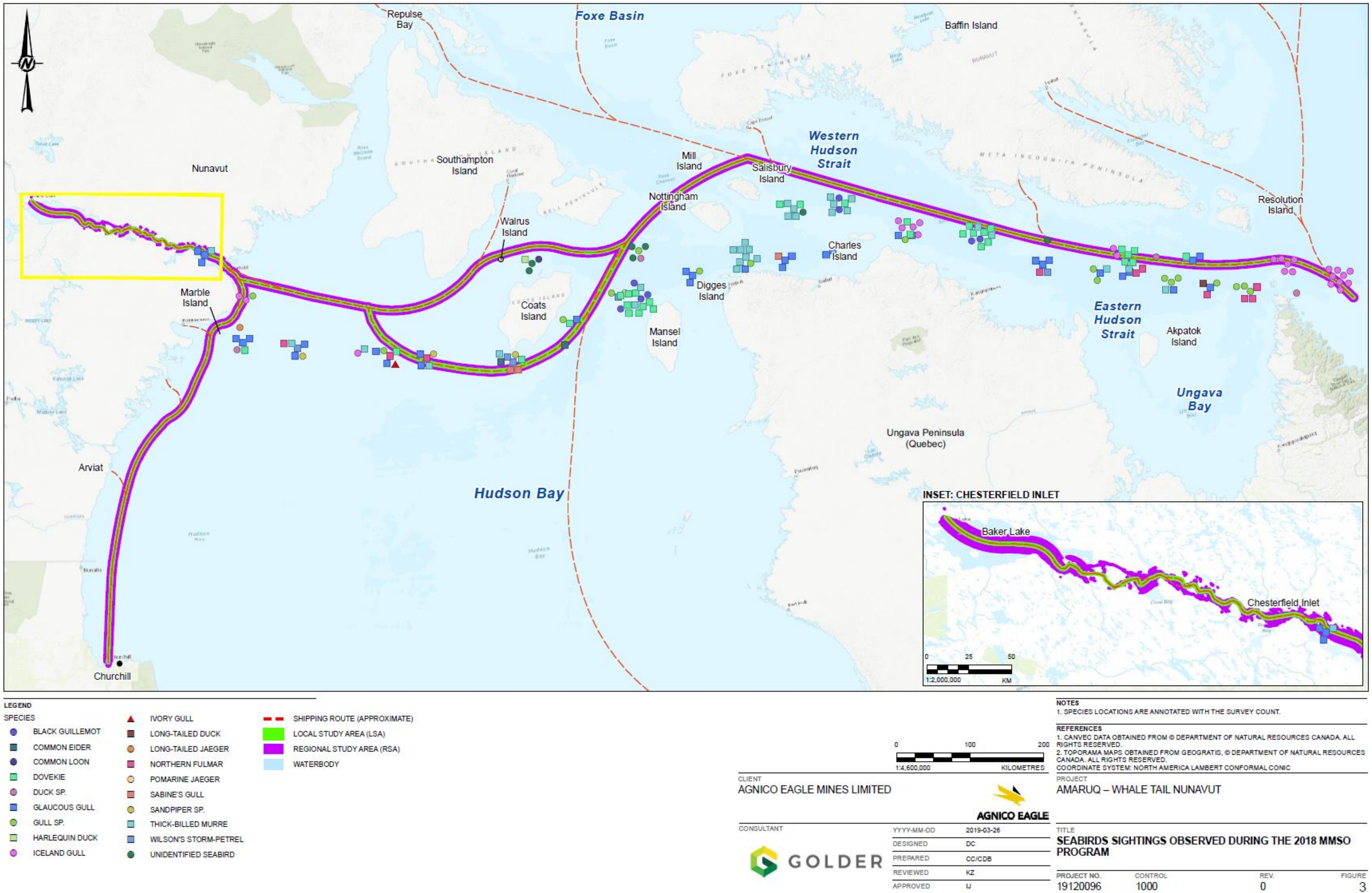
And

As required by NIRB Project Certificate No.004 Condition 41: ***Subject to vessel and human safety considerations, Cumberland shall require shippers carrying cargo to the Project through Chesterfield Inlet to follow the following mitigation procedures in the event that marine mammals are in the vicinity of the shipping activities:***

- ***a. Wildlife will be given right of way;***
- ***b. Ships will maintain a straight course, constant speed, and will avoid erratic behaviour; and***
- ***c. When marine mammals appear to be trapped or disturbed by vessel movements, the vessel will stop until the mammals have moved away from the area.***

Based on seabird sightings observed during the 2018 shipping season, Figure 26 below confirms that the primary shipping route used for the 2018 shipping season were south of Coats Island as the primary shipping route. Mitigation measures detailed under Project Certificate No. 004 Condition 41 and No.008 Condition 39 were followed in 2018. No interactions between vessels and seabirds or mammal were recorded during the 2018 season. A complete report regarding the Marine Mammal and Seabirds Observer (MMSO) can be found in Appendix 55.

Figure 26. Seabird sightings observed during the 2018 shipping season



11.8.2 Wildlife Monitoring on Vessel

As required by NIRB Project Certificate No.008 Condition 40: ***The Proponent shall develop and implement a ship-based marine mammal monitoring program, as part of a Marine Mammal Management and Monitoring Plan, in consultation with Fisheries and Oceans Canada, communities, and other interested parties. The Proponent shall report any accidental contact by project vessels with marine mammals or seabird colonies to applicable responsible authorities including Fisheries and Oceans Canada and Environment and Climate Change Canada. The Plan should be submitted to the Nunavut Impact Review Board at least 90 days prior to commencement of shipping activities, with subsequent updates submitted annually thereafter. Confirmation that the requirements of the Plan are being effectively implemented by shipping companies contracted by the Proponent should be provided with annual reporting.***

And

As required by NIRB Project Certificate No.004, Condition 36: ***ensure the placement of local area marine mammal monitors onboard all vessels transporting fuel or materials for the Project through Chesterfield Inlet***

And

As required by NIRB Project Certificate No.004, Commitment 95: ***Inuit observation and encounter reports for on-board vessels transporting goods and fuel through Chesterfield Inlet.***

The Marine Mammal Management and Monitoring Plan was provided as Appendix B of the Shipping Management Plan (Version 1, April 2018) found in Appendix 51 of the 2018 Annual Report.

A complete report, Marine Mammal and Seabird Observer (MMSO) Report 2018 Shipping Season, detailing the 2018 mammal and seabird observations during the shipping season can be found in Appendix 55. Below is a summary of the report and Agnico will refer the reader to the report in Appendix for a complete review.

Marine mammal observations were completed between July 22 to September 21, 2018. Dedicated marine mammal observer effort recorded on the MMSO datasheets included 29 hours and approximately 1,155 km. No marine mammal sightings or marine mammal-vessel interactions (e.g., strikes) were recorded in 2018. An additional 153 hours of marine mammal observations between Chesterfield Inlet and Baker Lake, during fuel transfer, were collected onboard by a local as per NIRB Project Certificate no.004 Condition 36.

Seabird monitoring was conducted for 26 days between June 30 and October 23, 2018. A total of 738 individuals comprised of 15 identified species and 4 unidentified species of seabirds were recorded during dedicated seabird monitoring. The most common species identified during the surveys in 2018 were thick-billed murre (Uria lomvia), black guillemot (Cepphus grylle), glaucous gull (Larus hyperboreus), iceland gull (Larus glaucoides) and dovekie (Alle alle). Two ivory gulls (Pagophila eburnea), listed as Endangered on Schedule 1 of the Species at Risk Act (SARA), were observed during the surveys in 2018. Seabirds were recorded throughout the shipping route with no apparent areas of concentration. No seabird interactions (e.g., strikes) with vessels were recorded in 2018. Dedicated seabird monitoring effort resulted in 1,833.6 km surveyed over 102.5 hours using moving platform surveys. An additional 153 hours of seabird observations between Chesterfield Inlet and Baker Lake, during fuel transfer, were collected onboard by a local as per NIRB Project Certificate no.004 Condition 36.

Agnico has tried to maximize the use of wildlife monitors based from the community of Chesterfield Inlet as per previous barge seasons and is intending to seek out monitors from the Chesterfield Inlet when possible. With availability of possible monitors being challenging in that area, Agnico would, alternatively, hire monitors from other local communities to ensure the condition is met.

11.8.3 Notification to communities

As required by NIRB Project Certificate No.008 Condition 41: ***The Proponent shall provide notification to communities regarding scheduled ship transits throughout the regional study area, including Hudson Bay and Chesterfield Inlet. The Proponent shall provide a summary of public consultation undertaken to address this term and condition in its annual report to the Nunavut Impact Review Board.***

Notification where provided to community before each vessel arrived in the community.

11.8.4 Ingress/Egress of Ship Cargo

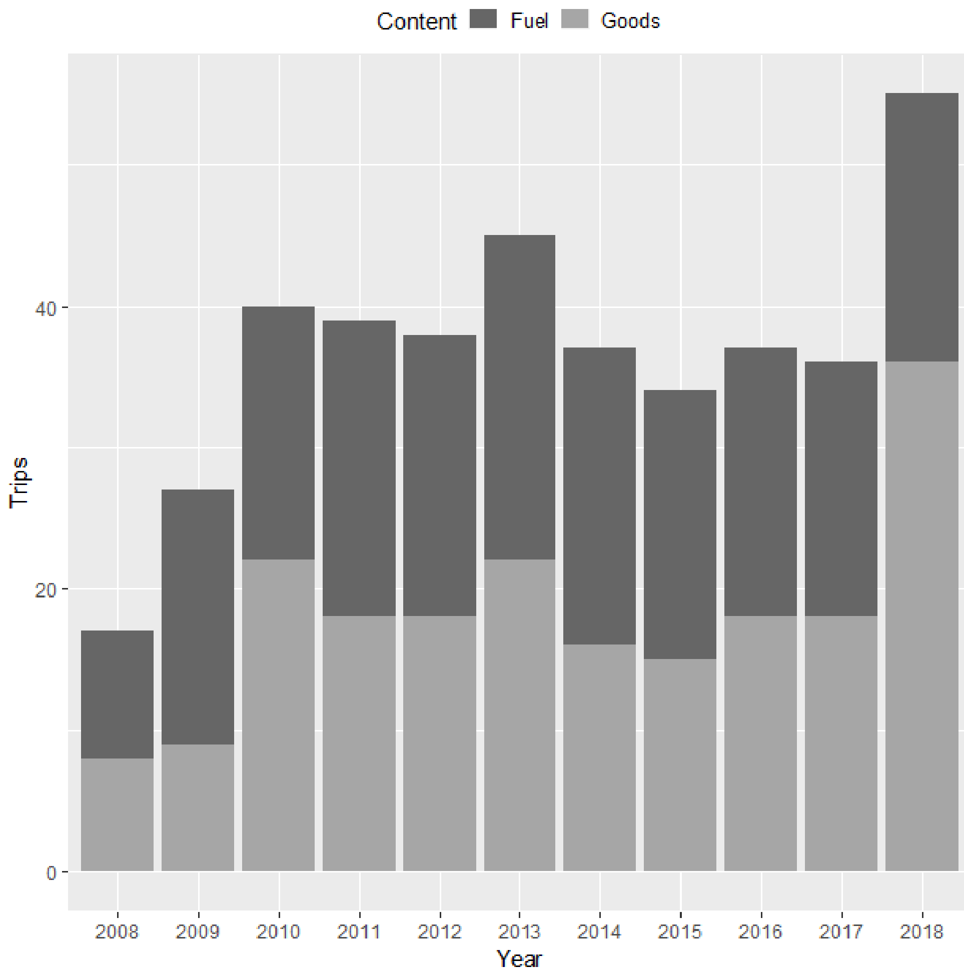
As required by NIRB Project Certificate No.004 Condition 82: ***Monitor the ingress/egress of ship cargo at Baker Lake and report any accidents or spills immediately to the regulatory agencies as required by law and to NIRB's Monitoring Officer annually.***

And

As required by NIRB Project Certificate No.008 Condition 43: ***The Proponent shall contract only certified vessels to carry cargo for the Project, and will ensure shippers are aware of the requirements of the Shipping Management Plan, the Risk Management and Emergency Response Plan, and the Oil Pollution Emergency Plan. Evidence of meeting the requirements of this term and condition should be submitted as part of annual reporting to the Nunavut Impact Review Board***

In 2018, Agnico monitored the ingress/egress of ship cargo at Baker Lake and the results are summarized in the below Figure 27. There is a significant increase for material containers from previous year due to the construction of the Whale Tail Project.

Figure 27. Barge traffic (number of trips/year) arriving in Baker Lake from Chesterfield Inlet since 2008



In 2018, no spills occurred during the ship cargo ingress/egress.

11.8.5 Insurance

As required by NIRB Project Certificate No.004 Condition 45: ***"[Cumberland] shall carry, and require contracted shippers to carry adequate insurance to fully compensate losses arising from a spill or accident, including but not limited to the loss of resources arising from the spill or accident; any claims are to be reported to proper officials with a copy to NIRB's Monitoring Officer"***

All shipping contractors have insurance to fully compensate losses arising from a spill or accident, including but not limited to the loss of resources arising from spill or accident for all marine transport vessels and vehicles travelling on the AWAR.

No claim was reported by our marine or trucking shippers in 2018.

11.9 CONSULTATION, ENGAGEMENT AND COMMUNICATION

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 24: ***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.***

Refer to table in Appendix 56 for more information regarding the public consultation and participation with local organization and the residents of the nearby communities. Appendix 56 is also use as reference in the following sections.

11.9.1 Chesterfield Inlet

As required by NIRB Project Certificate No.004, Condition 39: ***annually advertise and hold a community information meeting in Chesterfield Inlet to report on the Project and to hear from Chesterfield Inlet residents and respond to concerns; a consultation report shall be submitted to NIRB's Monitoring Officer within one month of the meeting.***

And

As required by NIRB Project Certificate No.008 Condition 42: ***The Proponent shall design monitoring programs to ensure that local users of the marine area along the shipping route have the opportunity to provide feedback and input in relation to monitoring and evaluating potential project-induced impacts and changes in marine mammal distributions. The Proponent shall demonstrate how feedback received from community consultations has been incorporated into the most appropriate mitigation or management plans. The Proponent shall provide a summary of public consultation undertaken to address this term and condition in its annual report to the Nunavut Impact Review Board.***

And

As required by NIRB Project Certificate No.004, Condition 40: ***Gather Traditional Knowledge from the local HTOs and conduct a minimum of a one-day workshop with residents of Chesterfield Inlet to more fully gather Traditional Knowledge about the marine mammals, cabins, hunting, and other local activities in the Inlet. Report to the KIA and NIRB's Monitoring Officer annually on the Traditional Knowledge gathered including any operational changes that resulted from concerns shared at the workshop.***

In accordance with NIRB Project Certificate No. 004, Condition 39 and 40, Agnico conducted its annual community meeting in Chesterfield Inlet on September 17th, 2018, in which Hamlet representatives and Chesterfield Inlet HTO were involved. Agnico Eagle collected the following concerns and Inuit Quajimajatunqangit from the meeting:

- Migration patterns of the caribou herds were being affected by the noise of the barges
- There are less seals than in the past, possibly due to shipping traffic
- Concerned about oil spills and the clean-up protocol
- Concerned about compensation (ex. wildlife fatality) and distribution of benefits from the mine

In order to continue to address these concerns, the following outcomes were decided upon:

- The shipping company Desgagnes will share environmental logs with the Hamlet and HTO
- Possibility of having a wildlife monitor on board from Chesterfield to Baker Lake
- More detailed information on number of barge trips to be provided

Additionally, as part of the Inuit Workforce Barriers Study (IWBS), interviews were conducted with Elders in Kivalliq communities. In Chesterfield, Elders voiced similar concerns about environmental and marine life impact as listed above.

11.9.2 Hunters and Trappers Organizations

As required by NIRB Project Certificate No.004, Condition 40: ***Gather Traditional Knowledge from the local HTOs and conduct a minimum of a one-day workshop with residents of Chesterfield Inlet to more fully gather Traditional Knowledge about the marine mammals, cabins, hunting, and other local activities in the Inlet. Report to the KIA and NIRB's Monitoring Officer annually on the Traditional Knowledge gathered including any operational changes that resulted from concerns shared at the workshop.***

And

As required by NIRB Project Certificate No.004, Condition 58: "*in consultation with Elders and the HTOs and subject to safety requirements, design the lighting and use of lights at the mine site to minimize the disturbance of lights on sensitive wildlife and birds*"

And

As required by NIRB Project Certificate No.004, Condition 59: ***In consultation with Elders and the HTOs, design and implement means of deterring caribou from the tailing ponds, such as temporary ribbon placement or Inukshuks, with such designs not to include the use of fencing"***

And

As required by NIRB Project Certificate No.004, Condition 68: ***Cumberland shall, in consultation with Elders, local HTOs and the Meadowbank Gold Mine SEMC, demonstrate that they are working toward incorporating Inuit societal values into mine operation policies."***

11.9.2.1.1 Baker Lake HTO

In 2018, three (3) meetings were held with the Baker Lake HTO. In 2018, the focus of most of the engagement with the Baker Lake HTO was on the development and implementation of the Memorandum of Understanding which resulted in a funding agreement between the parties on August 2nd, 2018. This funding agreement is intended to develop a collaboration that results in the capacity building of HTO staff to undertake research, monitoring and analysis of wildlife, through the development and implementation of hands-on skill development and theory-based training. Additionally, it creates a Wildlife Coordinator position within the HTO which participates in monitoring activities at the Projects. Agnico Eagle did continue regular engagement on project activities throughout 2018, including a meeting and site visit in October, and Baker Lake HTO is represented on the Meadowbank Community Liaison Committee.

11.9.2.1.2 Other HTO

In 2018, Agnico Eagle also met with Chesterfield Inlet HTO during the annual shipping meeting. Please refer to the previous section for more information.

11.9.3 Community Liaison Committees

In 2018, Agnico Eagle continued to facilitate meetings with the Meadowbank Community Liaison Committee in Baker Lake, which was established to inform stakeholders on the activities at the mine and to consult them on specific issues and projects.

The Community Liaison Committee's objective is to favour dialogue and exchange between Agnico Eagle and its local stakeholders such that all parties gain a better understanding of the issues associated with mining activities and provides a venue for stakeholders to provide advice to Management for solutions. The Committee consists of various representatives including Agnico Eagle, the Elders Society, youth, the business community, adult education committee, the Hamlet, the Nunavut Arctic College, the RCMP and the Hunters and Trappers Organization of Baker Lake. The meetings are chaired by the Agnico Eagle Community Liaison Coordinator.

Meetings are scheduled quarterly in both English and Inuktitut, with the understanding that the minimum number of meetings is two (2) annually. In 2018, four (4) Community Liaison Committee meetings were held, and one (1) included a visit to Meadowbank site on Nunavut Day to participate in celebrations.

11.9.4 Elders

In 2018, Agnico Eagle continued to consult with Elders on the Meadowbank and Whale Tail Projects through their involvement in the Community Liaison Committee and Baker Lake HTO meetings. Additionally, on August 14th, 2018, following feedback collecting during the July Whale Tail Phase 2 consultations, Agnico Eagle's President also visited Baker Lake to consult with Elders on Agnico Eagle's current and future operations.

In 2018, Elders continued to be involved in the administration of Agnico Eagle's Nunavut Leadership Development Program. During this training, supervisors are brought to Baker Lake and learn about Inuit Quajimajatunqangit from Elders in order to incorporate the teachings into their day-to-day supervision.

11.9.5 Baker Lake

11.9.5.1 Community Meetings in Baker Lake

Agnico held a community meeting in Baker Lake on December 18th, 2018 focusing on the AWAR and included discussions on safety rules, procedures to access road, wildlife and road closure. Additionally, at the suggestion of the community, Agnico Eagle held a similar meeting specifically for youth on May 22, 2018.

More details regarding Baker Lake Community meetings can be found in in the Appendix 56.

11.9.5.2 Site Tours for Baker Lake Residents

Each year, Agnico Eagle offers a variety of ways for the residents of Baker Lake, as well as various other groups or individuals from the Kivalliq, to visit Meadowbank Site. The list below outlines the major visits to the site during 2018:

- In July 2018, the mine welcomed the Mayors of Arviat and Baker Lake for a visit of Meadowbank and Whale Tail;

- Each year in August, Agnico Eagle invites the residents of Baker Lake to come on a site tour at Meadowbank Mine. In 2018, Meadowbank welcomed four (4) tours; and

- In October 2018, Agnico Eagle held its first "Take Out Kids to Work Day", which brought grade 9 students from Baker Lake to visit the mine site to learn about the operations, explore job possibilities, and see their parents in their workplace.

11.9.6 Community Engagement Initiatives

Community initiatives that Agnico participated in during 2018 are summarized in the Appendix 56.

11.9.6.1 Community Coordinators Program

The Community Coordinators program consists of full or part-time Agnico Eagle Coordinators in all Hamlets in the Kivalliq Region, including in Agnico Eagle's offices in the communities of Rankin Inlet and Baker Lake.

The objective of the community-based Agnico Eagle Coordinators is to provide a point of contact in each community to facilitate communications, provide services, and coordinate activities in the following areas:

- Support to the HR department by:
    - Assisting HR and other Agnico Eagle departments to locate employees or potential employees as required
    - Contact employees in advance of their shift departure times;
- Support to the Recruitment team by guiding interested individuals in the application process outlined by the Labour Pool Process;
- Provide advice and assistance to Agnico Eagle to organize and hold information sessions in the community on Agnico Eagle projects and initiatives, including those Labour Pool and business opportunities initiatives outlined in the Meliadine IIBA;
- Provide updates to the Hamlet Council on Agnico Eagle activities;
- Distribute Agnico Eagle information and promotional materials.

The increase of community involvement requirements for Agnico Eagle to achieve recruitment goals and the obligations for the NIRB and IIBA renders the Community Coordinators essential for Agnico Eagle's Nunavut operations.

11.9.7 Communication

As required by NIRB Project Certificate No.008, Condition 12: ***The Proponent shall establish a publically-accessible Project-specific web portal or web page to make available in a central location all significant non-confidential monitoring and reporting information submitted to regulatory authorities pursuant to the Project Certificate and other territorial or federal permits issued for the Project. For clarity, posting on the Project-specific site does not replace any reporting obligation of the Proponent pursuant to the Project Certificate or any territorial or federal permit.***

Agnico Eagle's website has a page where monitoring and reporting information can be posted, http://aemnunavut.ca/media/documents/.

In 2018, Agnico Eagle launched a Facebook page for Meadowbank Complex (Meadowbank and Whale Tail) which acts as another method with which it can inform the Kivalliq communities of important information, including road closures, recruitment information, and public meetings. This additional medium of communication was suggested by multiple stakeholder groups, including the Kivalliq Socio-Economic Monitoring Committee.

11.9.8 Exploration Activity Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6m: ***A summary of public consultation/participation, describing consultation with local organizations and residents of the nearby communities, if any were conducted***

There was no consultation related specifically to the Whale Tail Exploration Project in 2018. On September 21, 2018, in Arviat, there was a presentation of Agnico Exploration areas that explain the mining cycle timeline; Status of Permits (waiting on KIA); explanation of Agnico's approach to naming from exploration projects moving forward. Request for input on names of locations, traditional hunting and fishing spots, calving grounds, burial sites, and any other land use points. Refer to table in Appendix 56 for more information.

11.10 SOCIO-ECONOMIC MONITORING PROGRAM (SEMP, SEMC, SEMWG, SEMR)

11.10.1 Meadowbank and Whale Tail Sites

As required by NIRB Project Certificate No.004 Condition 63: ***the GN and INAC shall form a Meadowbank Gold Mine Socio-Economic Monitoring Committee ("Meadowbank SEMC") to monitor the socio-economic impacts of the Project and the effectiveness of the Project's mitigation strategies; the monitoring shall supplement, not duplicate, the monitoring required pursuant to the IIBA negotiated for the Project, and on the request of Government or NPC, could assist in the coordination of data collection and tracking data trends in a comparable form to facilitate the analysis of cumulative effects; the terms of reference shall focus on the Project, include a plan for ongoing consultation with KivIA and affected local governments and a funding formula jointly submitted by GN, INAC and [Cumberland]; the terms of reference shall be submitted to NIRB for review and subsequent direction within six (6) months of the issuance of a Project Certificate; [Cumberland] is entitled to be included in the Meadowbank SEMC.***

And

As required by NIRB Project Certificate No.004, Condition 64: ***[Cumberland] shall work with the GN and INAC to develop the terms of reference for a socio-economic monitoring program for the Meadowbank Project, including the carrying out of monitoring and research activities in a manner which will provide project specific data which will be useful in cumulative effects monitoring (upon request of Government or NPC) and consulting and cooperating with agencies undertaking such programs; [Cumberland] shall submit draft terms of reference for the socio-economic monitoring program to the Meadowbank SEMC for review and comment within six (6) months of the issuance of a Project Certificate, with a copy to NIRB's Monitoring Officer.***

And

As required by NIRB Project Certificate No 008, Condition 44: ***The Proponent is strongly encouraged to continue to participate in the work of the Kivalliq Socio-Economic Monitoring Committee along with other agencies and the communities of the Kivalliq region, and to identify areas of mutual interest and priority for inclusion into a collaborative monitoring framework that includes socio-economic priorities related to the Project, communities, and the Kivalliq region as a whole.***

And

As required by NIRB Project Certificate No.008, Condition 54: ***Proponent should ensure that the development of all project monitoring plans and associated reporting and updates are undertaken with active engagement of Kivalliq communities, land users, and harvesters. The Proponent should work with the Kivalliq Inuit Association, the local Hunters and Trappers Organizations and the Kivalliq Socio-Economic Monitoring Committee to report on the collection and integration of Inuit Qaujimaningit through its monitoring programs for the Project. To the extent that the sharing of such information is consistent with, and not limited by, any confidentiality or other agreements, summaries addressing the Proponent's fulfillment of this term and condition should be included in the Proponent's annual report to the Nunavut Impact Review Board.***

In 2018, Agnico Eagle continued to meet the requirements in the above conditions through its work in the following:

The Socio-Economic Monitoring Program (SEMP) acts as a terms of reference, or framework, for the monitoring program. It outlines the indicators, metrics, units of measurements, etc., including those that are mandated by the Project Certificates. Agnico Eagle commits to reporting on the SEMP annually. Agnico Eagle developed and submitted the Agnico Eagle Kivalliq Projects Socio-Economic Monitoring Program (SEMP) to NIRB on February 27, 2018, which included both the Meadowbank SEMP and Meliadine SEMP (the SEMP acts as a terms of reference or framework for the monitoring program, outlining the indicators, metrics, units of measurements, etc. of the program). The SEMP will be updated to include Whale Tail as well (see below for more details).

The Socio-Economic Monitoring Working Group (SEMWG), which includes GN and CIRNAC, aims to support Agnico Eagle's SEMP and the KvSEMC. The SEMWG submitted its most recent Terms of Reference on December 12, 2017. In 2018, Agnico Eagle met with the SEMWG on May 30, 2018 to discuss the 2017 Socio-Economic Monitoring Report, including to discuss how to address community-level data gaps, how to improve the KvSEMC meetings, and the update of the SEMP to include Whale Tail Project.

The Kivalliq Socio-Economic Monitoring Committee (KvSEMC) meets annually to present data, and consider socio-economic impacts and benefits of mining projects generally on the Kivalliq region. Members of the KvSEMC include Government of Nunavut (including specific departmental representation), Government of Canada, Kivalliq Inuit Association, Hunters and Trappers Organizations, Community representatives, community organizations and Project owners. The Government of Nunavut chairs the KvSEMC. Feedback provided in the KvSEMC informs the final Socio-Economic Monitoring Report. Additionally, the KvSEMC can recommend additional monitoring priorities. Agnico Eagle is an active participant in the KvSEMC. In 2018, the Kivalliq Socio-Economic Monitoring Committee meeting was held on April 24, 2018 in Arviat. Participants included CIRNAC, Department of Health, Department of Family Services, Department of ED&T, Department of Finance, Department of Education, Hamlet representatives from Arviat, Chesterfield, Naujaat, Rankin Inlet, Baker Lake, Coral Harbour, and Agnico Eagle. The KvSEMC recommended adding an additional different monitoring area (gender breakdown by skill level) and recommended adding further context on turnover data, which the Inuit Workforce Barriers Study (IWBS) will provide for the 2019 report.

The Socio-Economic Monitoring Report (SEMR) is the annual report on the SEMP. It is a comprehensive socio-economic monitoring report that contains Project-level data (data collected by Agnico Eagle at each Project site or regionally) and community-level data (data provided by or in communities). It is reviewed by both the SEMWG and the KvSEMC prior to its submission, to allow for those groups to provide insight or data. It is submitted to NIRB on or by June 30 annually as per the SEMWG Terms of Reference. The 2017 SEMR was submitted to NIRB on July 4, 2018.

In 2019, Agnico Eagle once again retained Aglu Consulting and Training Inc. in partnership with Stratos Inc. to produce the annual SEMR. The KvSEMC is planning to meet in Baker Lake in April 2019.

11.10.2 Whale Tail Site Updates

As required by NIRB Project Certificate No.008, Condition 45: ***The Proponent shall work in collaboration with other socio-economic stakeholders including, the Government of Nunavut, Indigenous and Northern Affairs Canada, the Kivalliq Inuit Association, and communities of the Kivalliq region, to establish a socio-economic working group for the Project to develop and oversee a Kivalliq Projects AEM Socio-Economic Monitoring Program. The working group will develop a Terms of Reference, which outlines each member's roles and responsibilities with regards to, where applicable, project specific socio-economic monitoring throughout the life of the projects. The Proponent shall work with the other parties to use the updated Kivalliq Projects Socio-Economic Monitoring Program to monitor the predicted impacts outlined in the projects' respective environmental impact statements as well as regional concerns identified by the Kivalliq Socio-Economic Monitoring Committee. The Proponent shall work in collaboration with all other socio-economic stakeholders such as the Government of Nunavut, Indigenous and Northern Affairs Canada, Kivalliq Inuit Association, and the communities of the Kivalliq region in developing this program, which should include a process for adaptive management and mitigation in the event unanticipated impacts are identified. The Terms of Reference for this multi-party, multi-project Working Group are to be provided to the Nunavut Impact Review Board (NIRB) upon completion, and within one (1) year of issuance of the Project Certificate. The Proponent shall produce annual joint "AEM Kivalliq Projects" Socio-Economic Monitoring reports throughout the life of the Projects that are submitted to the NIRB and discussed with the wider Kivalliq Socio-Economic Monitoring Committee. Details of the Kivalliq Projects Socio-Economic Monitoring Program are to be provided to the NIRB upon finalization, and within one (1) year of issuance of the Project Certificate. Information regarding the Proponent's efforts in***

fulfillment of this term and condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board.

And

As required by NIRB Project Certificate No.008, Condition 53: ***Provided the collection and sharing of such information is consistent with and not limited by any Inuit Impact and Benefit Agreement with the Kivalliq Inuit Association and that employees are willing to voluntarily provide this information, the Proponent should collect and provide project-specific data concerning employee community of residence and number of employees that relocated from the year prior (where available, to and from, for Arviat, Baker Lake, Chesterfield Inlet, Coral Harbour, Naujaat, Rankin Inlet and Whale Cove). The details of this process will be captured in the terms of reference for the project specific Whale Tail Pit Socio-Economic Monitoring Committee. Summaries of this information should be included in the annual Whale Tail Pit socio-economic monitoring reports submitted to the Nunavut Impact Review Board and shared with the wider Kivalliq Socio-Economic Monitoring Committee throughout the life of the Project.***

And

As required by NIRB Project Certificate No 008, Condition 46: ***The Proponent should develop a Project-specific Whale Tail Pit Socio-Economic Monitoring Program designed to:***

- ***Monitor for project-induced effects, including the impacts predicted in the Environmental Impact Statement through indicators presented in the Whale Tail Pit Socio-Economic Monitoring Plan;***
- ***Reflect regional socio-economic concerns identified by the Kivalliq Socio-Economic Monitoring Committee (KivSEMC);***
- ***Work in collaboration with all other socio-economic stakeholders such as the Kivalliq Inuit Association, the Government of Nunavut, and Indigenous and Northern Affairs Canada, and the communities of the Kivalliq region to develop the program; and***
- ***Include a process for adaptive management and mitigation to respond if unanticipated impacts are identified.***

Details of the Whale Tail Pit Socio-Economic Monitoring Program should be submitted to the Nunavut Impact Review Board (NIRB) within one (1) year of issuance of the Project Certificate. The Proponent should produce annual Whale Tail Pit socio-economic monitoring reports throughout the life of the Project that are submitted to the NIRB and shared with the wider KivSEMC.

And

As required by NIRB Project Certificate No 008, Condition 50: ***The Terms of Reference for this multi-party, multi-project Working Group are to be provided to the Nunavut Impact Review Board (NIRB) upon completion, and within one (1) year of issuance of the Project Certificate. Details of the Kivalliq Projects Socio-Economic Monitoring Program are to be provided to the NIRB upon finalization, and within one (1) year of issuance of the Project Certificate. The Proponent shall produce annual joint "AEM Kivalliq Projects" Socio-Economic Monitoring reports throughout the life of the Projects that are to be submitted as part of the Proponent's annual report to the NIRB.***

In response to CIRNAC's recommendations of October 10, 2018, and as per the extension request sent to NIRB on November 30, 2018, Agnico Eagle will submit the Whale Tail Socio-Economic Monitoring Program by or on June 30, 2019. The Whale Tail SEMP will be provided as part of an updated Kivalliq SEMP. The updated SEMP has already been provided to the SEMWG for comment, and will be presented to the KvSEMC in April 2019 for feedback as well.

As explained in previous communications with NIRB on the extension request, for clarity, there is no impact on the Meadowbank SEMP or Meliadine SEMP. The revised Kivalliq Projects SEMP, which will continue to include Meadowbank and Meliadine, and which will also include Whale Tail, will not result in the removal of any information/metrics. The only potential change for Meadowbank or Meliadine SEMPs, within the Kivalliq Projects SEMP, would be additional information or metrics from the Whale Tail SEMP that Agnico Eagle could extend to these projects, thus enhancing monitoring for those projects

Agnico Eagle has been in communication with the existing Agnico Eagle Kivalliq Projects Socio-Economic Monitoring Working Group to update the existing Terms of Reference to include the Whale Tail Project, which the Working Group already anticipated in the last update. The Terms of Reference for the Kivalliq Projects Socio-Economic Monitoring Working Group was update and provided to NIRB on March 11th, 2019. The document can be found in Appendix 57.

11.10.3 Socio-Economic Monitoring Report (SEMR)

As required by NIRB Project Certificate No.004, Condition 65: *Cumberland shall include in its socio-economic monitoring program for the Meadowbank Project the collection and reporting of data of community of origin of hired Nunavummiut.*

And

As required by NIRB Project Certificate No.004, Commitment 18: *Observe, collect and maintain information on road-use to facilitate monitoring of the nonproject uses of the road*

And

As required by NIRB Project Certificate No.004, Commitment 21: *Track the community of origin of hired Nunavimmiut to direct monitoring and followup activities*

And

As required by NIRB Project Certificate No.004, *Commitment 104: Cumberland agrees with GN that labor force adjustments, any pressures on physical and social infrastructure (including by emergency response planning), socio-economic impacts of public use of the access road, and community physical and mental health are issues that should be included in socio-economic monitoring*

And

As required by NIRB Project Certificate No.004, Commitment 108*: Information made available by or to Cumberland under the terms of the IIBA in the areas of support to businesses in accessing project opportunities will be forwarded to the GN*

And

As required by NIRB Project Certificate No.008, Condition 48: ***The Proponent is strongly encouraged to submit staff schedule forecasts that should, at a minimum, include the following:***

- ***Title of positions required by department and division;***
- ***Quantity of positions available by project phase and year;***
- ***Transferable skills, both certified and uncertified which may be required for, or gained during, employment within each position;***
- ***The National Occupational Classification code for each individual position.***

The Proponent should also identify and register all trades occupations, journeypersons, and apprentices working with the Project and make this information available to the Government of Nunavut to assist in delivery of training initiatives and programs. The Staff Schedule should be submitted to the Nunavut Impact Review Board six (6) months prior to each phase of the Project (construction, operations, closure).

And

As required by NIRB Project Certificate No.008, Condition 53: ***Provided the collection and sharing of such information is consistent with and not limited by any Inuit Impact and Benefit Agreement with the Kivalliq Inuit Association and that employees are willing to voluntarily provide this information, the Proponent should collect and provide project-specific data concerning employee community of residence and number of employees that relocated from the year prior (where available, to and from, for Arviat, Baker Lake, Chesterfield Inlet, Coral Harbour, Naujaat, Rankin Inlet and Whale Cove). The details of this process will be captured in the terms of reference for the project specific Whale Tail Pit Socio-Economic Monitoring Committee. Summaries of this information should be included in the annual Whale Tail Pit socio-economic monitoring reports submitted to the Nunavut Impact Review Board and shared with the wider Kivalliq Socio-Economic Monitoring Committee throughout the life of the Project.***

And

As required by NIRB Project Certificate No.008, Condition 61: ***The Proponent, in collaboration with the Government of Nunavut and the Nunavut Housing Corporation, is encouraged to investigate measures and programs designed to assist Project employees with pursuing home ownership or accessing affordable housing options in the Kivalliq region. The Proponent should provide access to financial literacy, financial planning, and personal budgeting as part of the regular Life Skills Training and/or Career Path Program. Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.***

And

As required by NIRB Project Certificate No.008, Condition 59: ***The Proponent is encouraged to work with the Kivalliq Inuit Association to establish cross-cultural training initiatives, which promote respect and consideration for the importance of Inuit Qaujimajatuqangit to the Inuit identity and to make this training available to Project employees and on-site sub-contractors. The Proponent should actively monitor the implementation of these initiatives, including the following items:***

- ***Descriptions of the goals of each program offered;***
- ***Language of instruction;***
- ***Schedules and location(s) of when each program was offered;***
- ***Uptake by employees and/or family members where relevant, noting Inuit and non-Inuit participation rates; and***
- ***Completion rates for enrolled participants, noting Inuit and non-Inuit participation rates.***

Summaries of the cross-cultural training initiatives implemented by the Proponent in fulfilment of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.

And

As required by NIRB Project Certificate No.008, Condition 62: ***The Proponent should work with the Government of Nunavut to develop an effects monitoring program that identifies Project-related pressures to community infrastructure such as airport and transportation infrastructure, policing, health and social services, in Baker Lake and all the point-of-hire communities of the Kivalliq Region. Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board***

The Socio-Economic Monitoring Report (SEMR) is the annual report on the SEMP. It is a comprehensive socio-economic monitoring report that contains Project-level data (data collected by Agnico Eagle at each Project site or regionally) and community-level data (data provided by or in communities), including those data that are mandated by the Project Certificate. It is reviewed by both the SEMWG and the KvSEMC prior to its submission, to allow for those groups to provide insight or data. It is submitted to NIRB on or by June 30 annually as per the SEMWG Terms of Reference. The 2017 SEMR was submitted to NIRB on July 4, 2018 (Appendix 58).

The section below represents a subset of Agnico Eagle's socio-economic reporting, related primarily to employment and training. For the full report on the Project's socio-economic monitoring, including those monitoring requirements of Agnico Eagle's Project Certificates for Meadowbank and Whale Tail Projects, please refer to the 2018 Agnico Eagle Kivalliq Projects Socio-Economic Monitoring Report, which will be submitted to NIRB on or by June 30, 2019.

Reports can also be viewed on the Socio-Economic Monitoring Committee website www.nunavutsemc.com or on Agnico Eagle's website http://aemnunavut.ca/media/documents/

11.10.3.1 Workforce

Agnico Eagle calculates the workforce based on headcount (snapshot of active employees taken at the end of the year, which includes full-time and part-time employees) and full-time equivalents (number of full-time positions based on hours worked, where one full time position is equivalent to 2,184 hours worked in a year).

The number of active Agnico Eagle employees working at Meadowbank and Whale Tail on December 31, 2018 was 896, of which 336 employees were Inuit employees. (The respective full-time equivalencies were 768 Agnico Eagle employees in total, with 241 full-time (FTE) Inuit Agnico Eagle employees).

The number of contractors employed at the project is only calculated using full-time equivalents (FTEs) due to the cyclical nature of contractor work. Therefore, during 2018 there were 544 full time equivalent (FTE) contractor positions.

Taken together, there were 1,440 active employees (Agnico Eagle permanent, temporary, on-call, students and contractors), working full- and part-time jobs, at the end of 2018.

Agnico Eagle defines job statuses as follows:

- Permanent employee: an employee whose current job is not specifically tied to a short-term project and the position is expected to be required throughout the life of mine (LOM).
- Temporary employee: an employee whose current job will not continue beyond a specified period of time.
- On-call employee: an employee who has an undefined contract and is called upon when the need arises. It is expected that on-call employees will move to temporary or permanent positions as they become available.

11.10.3.1.1.1 Employment Demographics for Nunavut Based Employees

The following tables shows the employment demographics for community of hire by headcount and full-time equivalents.

Table 11.5 Home communities of Agnico Eagle Inuit employees (by headcount)

Community of Hire	2017 Agnico Eagle headcount	2018 Agnico Eagle headcount
Arviat	68	74
Baker Lake	155	174
Naujaat	9	13
Rankin Inlet	31	15
Chesterfield Inlet	12	10
Whale Cove	11	9
Coral Harbour	8	19
Outside of Kivalliq	21	22
Total	**316**	**336**

Table 11.6 Home communities of Agnico Eagle Inuit employees by FTE

Community of Hire	2017 Agnico Eagle FTE	2018 Agnico Eagle FTE
Arviat	42	51
Baker Lake	108	121
Naujaat	4	8
Rankin Inlet	25	16
Chesterfield Inlet	6	4
Whale Cove	6	8
Coral Harbour	6	10
Outside of Kivalliq	20	23
Total	**217**	**241**

Agnico Eagle pays for the transportation of all Kivalliq-based employees from their home community to the mine for each work rotation. For employees coming from Arviat, Chesterfield Inlet, Rankin Inlet and/or Whale Cove, Agnico Eagle has a service contract with Calm Air to transport employees by charter plane from Rankin Inlet directly to and from the Meadowbank mine airstrip. For employees coming from Coral Harbour and/or Naujaat, a commercial ticket is bought from their home communities to the Baker Lake airport. Once in Baker Lake, they are transported by bus to and from the mine site via a daily ride. For all other employees not located in the Kivalliq region, transportation is provided from Mirabel and Val-d'Or via a charter flight operated by Nolinor Aviation.

11.10.3.1.1.2 Employee retention

Based on Agnico Eagle's past experience and testimonies of former employees, it was noted that many Inuit have never had full time work in their home communities, where full time employment opportunities are potentially limited. Many such individuals want a job, but working away from home for two weeks at a time in a structured industrial environment is a change that many have difficulty adapting to.

Exit interviews support this assumption and the following provides the most common reasons given for voluntary terminations and turnover rates:

- Found another job
- Conflict with employee
- Does not like the job
- No babysitter
- Family situation

Agnico Eagle developed a new approach and has rolled out new initiatives with a focus on providing information, skills, and education to job applicants to ensure that they are better informed about what working life is like at a remote mine site, and to be better prepared to adapt, cope, and be successful in employment. The result is the development and implementation of a Labour Pool Program that consists of a linked series of activities, including:

- Community-based information sessions
- Community-based Work Readiness training
- E-learning for mandatory training
- Site Readiness training at Meadowbank

- On-Call Contract Program (optional)
- Employment with Agnico Eagle or contractors

The Labour Pool Program consists of a suite of activities that provide future employees with information, skills, and education for working life and conditions in a remote, fly in/fly out, industrial workplace. The On-Call Contract Program allows new employees opportunities to experience and adapt to a new work environment by practicing camp life for short periods of time.

Supervisors have commented that due to the suite of Labour Pool activities, on-call employees are better prepared to cope with the mine employment environment. The On-Call Program allows participants to discuss employment and upward mobility opportunities, gain a variety of employment experiences and decide if the mining work life is for them. The program also allows Agnico Eagle to assess employees to ensure proper placement within the Company.

Employee Turnover = (# of terminations / (Average # of employees for the year))

In 2018, Agnico Eagle had a total turnover of 19%. Non-Inuit turnover was 10% and Inuit turnover was 34%.

11.10.3.1.1.3 Summer Student Employment Program

Agnico Eagle offers two summer employment programs that are accessible to students. Firstly, Agnico Eagle's company-wide policy offers a summer employment program to the children of all Agnico employees (both Inuit and non-Inuit) that are undertaking postsecondary education. Secondly, in 2018 Agnico Eagle also offered the Inuit Summer Employment Opportunities postings, which is targeted to Inuit students in high school or post-secondary and tries to match students to positions in their areas of interest. In 2018, Agnico Eagle had one (1) Inuk employee hired through this posting. Agnico Eagle will continue to offer both programs in 2019 and continue to work in collaboration with the KIA to encourage Kivalliq applicants to apply for the programs.

As per Agnico Eagle policies, students must be 18 years or over to work at the Operation, and over 16 years old to work in the offices in Baker Lake or Rankin Inlet

11.10.3.2 Training

Agnico Eagle's Training Management System (TMS) and the Learning Management System (LMS) tracks and reports on training activities.

11.10.3.2.1 Pre-employment training

The Labour Pool Process (formerly 'Labour Pool Initiative'), implemented in 2014 and revised in 2015, is based on an agreement between Agnico Eagle and the KIA through the IIBAs to offer pre-employment opportunities to Inuit from all Kivalliq communities.

The goal of the program is to pre-qualify candidates from Kivalliq communities through 5 steps: employment information sessions, online application (facilitated by Employment Information Sessions), the Work Readiness Program, mandatory trainings (more details provided below), and the Labour Pool List (facilitated by the Labour Pool Coordinator).

All applicants that have the minimal requirements to be hired (must be at least 18 years old and have a clean record of employment with Agnico Eagle) are required to complete mandatory training by e-learning as well as participate in the 5-day Work Readiness and Site Readiness training programs. The objective is to create a pool of candidates ready to work that Agnico Eagle and its contractors can draw future employees from.

Figure 28. Labour Pool Process

11.10.3.2.1.1 __Work Readiness Training Program__

Agnico Eagle continues to utilize the Work Readiness Training program that was developed as a pre-employment initiative. In 2018, the Work Readiness Training was delivered in collaboration between Aglu Consulting and Training and Northern College. The Work Readiness program is the first step of the Labour Pool Process for those individuals who have applied online who do not have work experience relevant to the positions for which Agnico Eagle hires.

The objective of the program is for Inuit applicants to be better prepared for the work environment in an industrial setting. Graduates of the program are eligible to continue the Labour Pool Process and attend the mandatory trainings given on-site. The program provides coaching on a range of issues including: awareness of employers' unspoken expectations, communication in the workplace, and problem-solving skills for resolving workplace issues.

The program was implemented in April 2013. The program is delivered over a five-day period at the community level and is scheduled throughout the year. In 2018, the program was delivered by a visiting instructor in all seven Kivalliq communities resulting in 183 participants from various communities, from which 85% successfully completed the program.

In 2018, Agnico Eagle partnered with PMC Renewal and the Nunavummi Disabilities Makinnasuaqtiit Society (NDMS); two organizations that delivered Work Readiness program across the Kivalliq through contracts with the GN's Department of Family Services. Agnico Eagle now considers those who have completed this program as an equivalent to the Work Readiness program for those who are interested in gaining employment with Agnico Eagle.

11.10.3.2.1.2 <u>Mandatory Training (Site Readiness)</u>

Participants that have successfully completed the Work Readiness Program will be retained for the Mandatory Training Program (called "Site Readiness") and then will become part of the Labour Pool.

The Mandatory Training Program is a five-day training provided at the Meadowbank site. Throughout the week, participants are enrolled in diverse activities such as mandatory training sessions, site visits, job initiation, information sessions on training and career opportunities, as well as interviews and discussions on employment opportunities with a Human Resource representative to assess career ambitions and identify work interest.

Afterwards, candidates wanting to work for the Camp Department are given short term on-call assignments. All other applicants become part of the Labour Pool list until a job opportunity matching their interest and competencies becomes available.

In 2018, 142 candidates successfully completed the Mandatory Training.

11.10.3.2.2 Training Hours

The following categories of training are available:

- Mandatory: Mandatory training related to compliance with the Nunavut Mine Act, as well as training that is mandated according to AEM Health and Safety policies. Many of these training sessions are offered via e-learning prior to employee's arrival on site.
- General: Training activities required at a departmental level and covers many employees working in different departments. General training includes training on light duty equipment as well as enterprise software systems and cross-cultural training.
- Specific: Focused on developing individual competencies related to a specific position. This training qualifies individual workers for promotion following their progression through the Career Path. These training programs are provided by in classroom (theory) learning as well as practical (one-on-one) learning.
- Education (new to 2018)
- Emergency Response Training (ERT)

The following table provides the training hours provided to Agnico Eagle employees at Meadowbank and Whale Tail (excluding contractors) in 2018:

Table 11.7 2018 Training hours

Type of Training	Inuit	Non-Inuit	Total
Mandatory	1,545	5,453	6,998
General	893	3,319	4,212
Specific	20,199	4,659	24,858
Education	80	0	80
ERT	84	764	848

Total	**22,801**	**14,194**	**36,996**

11.10.3.2.3 Training Programs

11.10.3.2.3.1 E-learning

Before coming to an Agnico Eagle site for the first time, newly hired employees must complete their Mandatory Training online, which consists of six (6) modules: General Induction, WHMIS, Fire Suppression, Job Hazard Analysis and Work Card, Spill Response, and Occupational Health and Safety (Personal Protective Equipment, Ladder Safety, Surface Standard Operating Procedure). The General Induction chapter provides general information about Agnico Eagle and working life at the mines. The e-learning training material has been translated into English, French, and Inuktitut

As per the requirement of the IIBAs, in 2017 two new e-learning lessons were developed and added to the General Induction. The Inuit Impact and Benefit Awareness module (IIBA) provides general awareness on: Agnico's Commitment to Indigenous People, history of the Nunavut Agreement and the different Inuit organization branches, what an IIBA is and why the sites have one, and a high level overview of the benefits and impact mitigation provided through the IIBAs. The Archaeology module informs workers on how to identify potential archaeological sites (ex. fox traps, tent circles, hunting blinds) and what to do if a worker finds one when working in the tundra. An objective of these lessons is also to give each employee and contractor employee cross-cultural context before arriving on one of Agnico's sites.

In 2018, three (3) e-learning lessons have been updated: Process Plant Induction, Chemical Awareness and General Induction. The e-learning WHMIS, which is now WHMIS 2015, has been modified according to meet the new WHMIS standards.

11.10.3.2.3.2 Cross-Cultural

Implemented in 2010 at Meadowbank, the Cross Cultural Training Program has been provided to numerous employees. It is a 5 hour in-class training course. This course allows employees from different cultures and backgrounds to understand each other's culture in order to improve understanding and communication at the workplace.

The program was revisited with the assistance of the Nunavut Literacy Council in 2013, and a revised program was initiated in 2014. This program is mandatory for all Agnico Eagle employees and contractors who will be on site for six months or more. The training is in English, Inuktitut and French, and is offered at both Meadowbank and Whale Tail (and it is possible for employees to attend sessions at the other site).

In 2018, Meadowbank and Whale Tail had 10 sessions.

11.10.3.2.3.3 Career Paths

The Career Path Program was designed in 2012, with the intention of supporting upward mobility of Inuit employees at Meadowbank and Whale Tail. This program identifies the incremental steps that any employee is required to complete to advance in their chosen career of interest.

The objective is to have only internal promotions of employees, with external candidates being hired only as an entry level position to feed the trainee programs at the base.

In 2018, the Career Path system was available in eight (8) areas of activity; Underground (Meliadine only), Drill, Building Mechanic, Maintenance, Process Plant, Road Maintenance, Field Services, and Mine Operations.

11.10.3.2.3.4 Haul Truck Trainee

The Haul Truck Trainee program is a 28-day (336 hour) program to certify haul truck operators, which includes training on a simulator, in the classroom, and on the job. The program is aimed at existing employees in entry level positions (dishwashers, janitors, chambermaids, etc.). In order to provide the best training possible to all the trainees, there is a maximum of 4 trainees at a time with one trainer.

In 2018, 43 trainees (25 men, 17 women; one woman did the training twice) were enrolled in the Haul Truck Trainee Program. Among those, a total of 23 trainees successfully completed the Program.

11.10.3.2.3.5 Process Plant Trainee/Super Operator Program

With the success of the Haul Truck Trainee Program, a Process Plant Trainee Program was developed in 2015. The 28-day program provides employees with an understanding of the mining and milling process and trains them to be competent and certified to fill positions as a process plant helper or a utility person.

Implemented in the second half of 2016, the Super Operator Program is an extension of the Process Plant Trainee Program. This 168-hour training is provided to employees who have successfully completed the Process Plant Trainee Program. The extension of the Process Plant Trainee Program will consist in teaching the basics of maintenance principles in order to have employees with more diversified skills in the Process Plant Department. These employees will eventually be able to perform specific basic maintenance repairs throughout the plant.

In 2018, no trainees were enrolled in the Process Plant Trainee/Super Operator Program. No trainee programs were run this year due to the transition between Meadowbank Operation to Whale Tail.

11.10.3.2.3.6 Long Haul Trainee

The Long Haul Truck Trainee program is a 28-day (336 hour) program to certify long haul truck operators, which includes training on a simulator, in the classroom, and on the job. The program is aimed at existing employees in the mine department. In order to provide the best training possible to all the trainees, there is a maximum of 4 trainees at a time with one trainer.

The 2018 the pilot program was in development, so no trainees were enrolled in the Long Haul Truck Trainee Program.

11.10.3.2.3.7 Apprenticeship Program

The Apprenticeship Program combines on-the-job learning and in-school technical instruction to allow Inuit employees the opportunity to be educated and trained in the trade of their choice. By the end of the program, the apprentice is able to challenge their Certificate of Qualification (COQ) to become a Journeyperson and will also have the opportunity to challenge their Red Seal Exams. Currently, we offer trades (8) trades: cook, carpenter, millwright, electrician, heavy duty equipment technician, welder, housing maintainer and plumber.

In 2018, one (1) employee completed his apprenticeship training with Agnico Eagle. Three (3) apprentices went to technical training in Alberta this year. As of the end of 2018, there were 14 apprentices and pre-apprentices at Meadowbank/Whale Tail.

Since 2015 a total of (5) five employees completed their apprenticeship training within Agnico Eagle.

11.10.3.2.3.8 Adult Educator

A permanent Adult Educator (based on-site at Meadowbank) was hired in June 2018 to support Agnico Eagle employees in developing their numeracy, literacy, and soft skills in order to assist employees in accessing higher job positions and to be successful in their apprenticeships. The Adult Educator has been working with five (5) temporary pre-apprentices to help them gain the academic skills and confidence to successfully pass their trade's entrance exam. Instruction takes place during an employee's workday and is specific to their learning needs.

The Adult Educator is also tasked with planning and implementing school-based initiatives such as TASK week.

11.10.3.2.3.9 Emergency Response Team (ERT) training

At Agnico Eagle Mines Ltd., the most important priority is to keep employees safe. At Meadowbank, an Emergency Response Team (ERT) is well trained and is always ready to assist and help in any type of situation. To join the team, a candidate must show signs of interest in safety, prove good attendance and behavior at work, and also be in good physical condition.

An ERT practice takes place every Sunday and each member must attend at least six (6) practices throughout the year.

Throughout the year, ERT members were trained in first aid, firefighting, extraction, search and rescue, rope rappelling, etc. This training includes practical aspects as well written exams.

11.11 GENERAL SOCIO-ECONOMIC PROVISIONS

11.11.1 Whale Tail Site

11.11.1.1 Staff Schedule

As required by NIRB Project Certificate No.008, Condition 48: ***The Proponent is strongly encouraged to submit staff schedule forecasts that should, at a minimum, include the following:***

- ***Title of positions required by department and division;***
- ***Quantity of positions available by project phase and year;***

- ***Transferable skills, both certified and uncertified which may be required for, or gained during, employment within each position;***
- ***The National Occupational Classification code for each individual position.***

The Proponent should also identify and register all trades occupations, journeypersons, and apprentices working with the Project and make this information available to the Government of Nunavut to assist in delivery of training initiatives and programs. The Staff Schedule should be submitted to the Nunavut Impact Review Board six (6) months prior to each phase of the Project (construction, operations, closure).

Construction Phase staff schedules have been sent to NIRB on May 2, 2018. Agnico Eagle plans on updating the schedules ahead of the Operations Phase to send to NIRB.

11.11.1.2 Semi-Annual Call with Regulators

As required by NIRB Project Certificate No.008, Condition 49: ***The Proponent shall make best efforts to collaborate with the Government of Nunavut's Career Development Officer, Regional Manager of Career Development, and Director of Career Development. Semi-annual calls, at a minimum, should be initiated by the Proponent to address:***

- ***Hiring procedures and policies***
- ***Issues regarding employee recruitment and retention***
- ***AEM policies regarding career pathways and opportunities for advancement***
- ***Internal and/or partnered training and development of employees***
- ***Long-term labour market plans to facilitate training in communities***

Summary information addressing the Proponent's fulfillment of this term and condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board.

Agnico Eagle plans on initiating semi-annual calls in 2019.

11.11.1.3 Listing of Formal Certificates and Licences

As required by NIRB Project Certificate No.008, Condition 52: ***The Proponent should develop and maintain an easily referenced listing of formal certificates and licences that may be acquired via on-site training or training during project employment. The listing shall indicate which of these certifications and licences would be transferable to a similar job site within Nunavut. The initial listing should be provided to the Nunavut Impact Review Board within six (6) months of the Project Certificate being issued. Updates to the list should be included in the Proponent's annual reports submitted to the Nunavut Impact Review Board and shared with the wider Kivalliq Socio-Economic Monitoring Committee throughout the life of the Project.***

The listing of formal certificates and licenses was sent to NIRB on December 14, 2018. There have not been any updates since the last submission. The list can be found in Appendix 59.

11.11.1.4 LMA and IWBS

As required by NIRB Project Certificate No.008, Condition 50: ***The Proponent will report the results of its Labour Market Analysis (LMA) and Inuit Work Barrier Study (WBS) to the Kivalliq Socio-Economic Monitoring Committee upon completion in 2018, which should integrate the findings into its ongoing work identifying gaps***

between the Kivalliq labour market and mining market needs, and how to activate latent labour pool in the Kivalliq region to maximize labour "capture" from mining for the region. The Proponent shall report the results and implications of the LMA and WBS within its first year's Annual Report to the Nunavut Impact Review Board (NIRB), and show how the results have been integrated into an updated Socio-Economic Monitoring Plan for the Whale Tail Pit Project.

The LMA and IWBS was submitted to NIRB on March 6th, 2019. Additionally, results will be presented to KvSEMC in April 2019, and incorporated into the SEMR submitted on or by June 30, 2019. Report can be respectively found in Appendix 60 and 61.

11.11.1.5 Health Committee

As required by NIRB Project Certificate No.008, Condition 58: ***The Proponent is encouraged to form a subcommittee which includes Government of Nunavut representatives to reach consensus decisions on health related issues that the Proponent or the Government of Nunavut bring forward (e.g. programs and services to address sexually transmitted infections, a process for the treatment and transport of workers that may require medical services beyond that which the mine provides, monitoring and reporting on the impacts of the Project on health services within the potentially impacted communities and particularly, Baker Lake. etc.). Information regarding the Proponent's fulfillment of this term and condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board.***

And

As required by NIRB Project Certificate No.008, Condition 60: ***The Proponent shall engage with the Government of Nunavut to develop a process to ensure that any conditions first treated at the mine site and requiring ongoing care is appropriately accommodated in a timely manner at community health centres as required. Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.***

The Meadowbank and Whale Tail clinics collaborate with the health centres on STI referrals and treatment and transport of workers. Agnico Eagle has not heard concerns from community health care providers about the process of transitioning the employee from site-care to community care, however, Agnico Eagle would like to be able to consistently reach and exchange information with community health centres, which is currently a challenge. Agnico Eagle will look to establish a forum under TC58 where improvements can be discussed in 2019.

11.11.1.6 Home Ownership

As required by NIRB Project Certificate No.008, Condition 61: ***The Proponent, in collaboration with the Government of Nunavut and the Nunavut Housing Corporation, is encouraged to investigate measures and programs designed to assist Project employees with pursuing home ownership or accessing affordable housing options in the Kivalliq region. The Proponent should provide access to financial literacy, financial planning, and personal budgeting as part of the regular Life Skills Training and/or Career Path Program. Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.***

Agnico Eagle will reach out again to NHC in 2019 with the intention to collaborate on the topic of home ownership and affordable housing options.

SECTION 12. POST-ENVIRONMENTAL ASSESSMENT MONITORING PROGRAM (PEAMP) – EVALUATION OF IMPACT PREDICTIONS

As per Meadowbank's NIRB Project Certificate, Appendix D (Post-Environmental Assessment Monitoring Program (PEAMP)), the following provides a review of monitoring conducted in 2018 in relation to impacts described in the Final Environmental Impact Statement (FEIS; Cumberland, 2005). As stated in the NIRB Project Certificate, the PEAMP is a conceptual program designed "to work as an instrument of the proponent's overall monitoring efforts and should provide feedback to the NIRB and other agencies regarding ongoing project monitoring." The overall goal of this program is to provide the NIRB and other regulatory agencies with information on how actual environmental and socioeconomic effects of the Meadowbank mine site compare to impacts predicted in the FEIS.

More specifically, the objectives of the PEAMP as specified in the Project Certificate Appendix D are to:

a) Measure the relevant effects of the project on the ecosystemic and socioeconomic environment(s). These effects may be measured through biophysical and socioeconomic monitoring programs undertaken by the Proponent or by other means as described in the Project Certificate;

b) Assess the accuracy of the predictions made within the FEIS;

c) Evaluate the effectiveness of project monitoring procedures and plans;

d) Identify impacts requiring additional mitigation or adaptive management; and

e) Provide relevant data and information to support regional monitoring initiatives where feasible.

In addition, a discussion of year-over-year trends is provided where appropriate for any monitoring components where an exceedance of impact predictions was observed. Cases where original impact predictions can no longer be supported based on monitoring results to date are identified. A note on the overall effectiveness of management and mitigation strategies employed at the minesite is provided, based on the number and degree of impact prediction exceedances. Any known use of data or contributions made by Agnico to regional monitoring programs are described.

The methods, objectives, results and recommendations of the specific monitoring reports and results are discussed in greater detail above in the annual report, or in attached appendices.

It should be noted that the monitoring programs as described in the FEIS were developed at a conceptual level to assist in evaluating the overall potential impacts of the project. These were supporting documents in the FEIS and assisted in informing predictions, establishing regulatory limits, and forecasting management and mitigation actions to assist in the impact prediction process. Monitoring plans and sampling locations have since undergone changes and revisions to reflect actual mine operations. Monitoring and management plan revisions have been approved by the Nunavut Water Board, most recently during the renewal process for the Meadowbank Type A Water License which was completed in 2015. These differences are taken into account and identified when making comparisons to FEIS predictions.

Based on the FEIS, this section has been organized into 6 main categories: Aquatic Environment, Wildlife and Terrestrial Environment, Noise Quality, Air Quality, Permafrost, and Socio-Economics. For each of these categories, Table 12.1 summarizes the valued ecosystem components (VECs) identified in the FEIS, the original impact predictions and the management plans/mitigative measures submitted as part of the FEIS, implementation of mitigation in 2018, and whether impact predictions continue to be supported. This review focuses on the potential impacts for which monitoring was recommended, for the phase of mine activity currently underway (i.e. operations).

All monitoring results are provided in this annual report document, are publicly available, and may therefore be used to support regional monitoring initiatives. In addition, Agnico Eagle is currently working with various researchers in multiple disciplines (i.e. tailings storage and optimization, wildlife and aquatic researchers, socio-economic researchers, etc.) and would be interested in discussing other opportunities with the NIRB as requested.

Table 12.1. Summary of FEIS VECs, assessment endpoints, references for the predictions, management and mitigative measures, assessment of mitigation measures that are in practice, and commentary on whether impact predictions continue to be supported based on monitoring results. ^For wildlife, monitoring results are compared to TEMP thresholds, rather than FEIS predictions (see Section 12.2.2). *Interpretation based on trend analysis; see relevant section of the PEAMP for details.

VEC	Summary of Potential Impacts	Reference for Impact Predictions	Reference for Management and Mitigative Measures	Mitigation Employed as Planned (Y/N)	Impact Prediction Supported by Monitoring^ (Y/N)*
Aquatic Environment					
Surface water quantity	Reduced water level and flow in receiving lakes	FEIS, Section 4.21.2.3 FEIS App B, Table B4	FEIS, Section 4.24.2.5	Yes – see Section 12.1.1	Yes – see Section 12.1.2
Surface water quality	Contamination of receiving lakes	FEIS, Section 4.21.2.3 FEIS App B, Table B5 FEIS App E FEIS - WQ	FEIS, Section 4.24.2.5	Yes – see Section 12.1.1	Partially – while some parameters exceed FEIS water quality modelling, overall significance of impacts is consistent with predictions. See Section 12.1.2
Fish populations	Direct impacts through blasting. Indirect impacts through habitat changes.	FEIS, Section 4.21.2.7 FEIS App B, Table B13	FEIS, Section 4.24.2.3	Yes – see Section 12.1.1	Yes – see Section 12.1.2
Fish habitat	Direct impacts through habitat destruction or alteration. Indirect impacts through introduction of contaminants.	FEIS, Section 4.21.2.7 FEIS App B, Table B14	FEIS, Section 4.24.2.3 NNLP (2006, 2012)	Yes – see Section 12.1.1	Yes – see Section 12.1.2
Terrestrial Environment					
Vegetation (wildlife habitat)	Removal of plant cover, abrasion/grading, salt, dust, grey water release	FEIS, Section 4.21.2.4 FEIS App B, Table B6	FEIS, Section 4.24.2.1 TEMP (2018)	Yes – see Section 12.2.1	Yes – see Section 12.2.2

VEC	Summary of Potential Impacts	Reference for Impact Predictions	Reference for Management and Mitigative Measures	Mitigation Employed as Planned (Y/N)	Impact Prediction Supported by Monitoring^ (Y/N)*
Ungulates	Habitat loss, mortality	FEIS, Section 4.21.2.5 FEIS App B, Table B7	FEIS, Section 4.24.2.2 TEMP (2018)	Yes – see Section 12.2.1	Potential for impacts outside of predictions – further analysis ongoing. See Section 12.2.4
Predatory mammals	Habitat loss, mortality	FEIS, Section 4.21.2.5 FEIS App B, Table B8	FEIS, Section 4.24.2.2 TEMP (2018)	Yes – see Section 12.2.1	Yes – see Section 12.2.2
Small mammals	Habitat loss, mortality	FEIS, Table 4.24 FEIS App B, Table B9	FEIS, Section 4.24.2.2 TEMP (2018)	Yes – see Section 12.2.1	Yes – see Section 12.2.2
Raptors	Habitat loss, mortality	FEIS, Section 4.21.2.6 FEIS App B, Table B10	FEIS, Section 4.24.2.2 TEMP (2018) FEIS App B, Table B10	Yes – see Section 12.2.1	Yes – see Section 12.2.2
Waterfowl	Habitat loss, ingestion of contaminants, mortality	FEIS, Section 4.21.2.6 FEIS App B, Table B11	FEIS, Section 4.24.2.2 TEMP (2018)	Yes – see Section 12.2.1	Yes – see Section 12.2.2
Other breeding birds	Habitat loss, mortality	FEIS, Section 4.21.2.6 FEIS App B, Table B12	FEIS, Section 4.24.2.2 TEMP (2018)	Yes – see Section 12.2.1	Yes – see Section 12.2.2
Air Quality	Contamination of aquatic environment by dust. Contamination of terrestrial environment by dust. Poor air quality. Odours may attract scavengers. Production of greenhouse gases, other gaseous contaminants and particulate matter.	FEIS, Section 4.21.2.2 FEIS App B, Table B2	FEIS, Section 4.24.2.3 AQNMP (2005)	Yes – see Section 12.4.1	Yes – see Section 12.4.2
Noise	General disturbance of wildlife as a result of regular noises (behavioural changes, displacement). Reduced habitat effectiveness.	FEIS, Section 4.21.2.2 FEIS App B, Table B3	Noise Abatement and Monitoring Plan, June 2018	Yes – see Section 12.3.1	Yes – see Section 12.3.2

VEC	Summary of Potential Impacts	Reference for Impact Predictions	Reference for Management and Mitigative Measures	Mitigation Employed as Planned (Y/N)	Impact Prediction Supported by Monitoring^ (Y/N)*
Permafrost	Thaw instability. Changes in permafrost depth in various areas (increase/decrease). Ice entrapment in tailings/reclaim.	FEIS, Section 4.21.2.1 FEIS App B, Table B1	FEIS Appendix B, Table B2.2	Yes – see Section 12.5.1	Yes – see Section 12.5.2
Socio-Economic VECs					
Traditional Ways of Life (personal and community)	Reduced access to land. Reduction in traditional activities including harvesting. Undervaluing traditional ways and loss of knowledge.	FEIS Section 4.21.4.4 FEIS App B, Table B15	FEIS Section 4.24.3 FEIS App B, Table B15	Yes – see Section 12.6.1	Yes - see Section 12.6.2
Employment, Training, and Business Opportunities	Financial expenditures of $23 million annually for 10 years. Employment of at least 60 workers. Goods and services contracts for local businesses. Overall increased economic activity, including indirect and induced effects. Increased capacity of local labour force to participate in formal economy. Increase in interest of school on part of youth. Increased individual, family, and community wellness.	FEIS Section 4.21.4.3 FEIS App B, Table B15	FEIS Section 4.24.3 FEIS App B, Table B15	Yes – see Section 12.6.1	Yes - see Section 12.6.2
Wellness (personal and community)	Poor financial decision making. Increased income disparity. Increased public health and safety risks. Stress from rotational employment. Increased traffic accidents and emergencies. Disturbance by project activities.	FEIS Section 4.21.4.5 FEIS App B, Table B15	FEIS Section 4.24.3 FEIS App B, Table B15	Yes – see Section 12.6.1	Yes - see Section 12.6.2

VEC	Summary of Potential Impacts	Reference for Impact Predictions	Reference for Management and Mitigative Measures	Mitigation Employed as Planned (Y/N)	Impact Prediction Supported by Monitoring^ (Y/N)*
Infrastructure and social services	Shortage of housing and other infrastructure. Increased demand for social services.	FEIS Section 4.21.4.6 FEIS App B, Table B15	FEIS Section 4.24.3 FEIS App B, Table B15	Yes – see Section 12.6.1	Yes - see Section 12.6.2
Sites of heritage significance	Potential degradation of historically significant sites.	FEIS Section 4.21.4.7 FEIS App B, Table B15	FEIS Section 4.24.3 FEIS App B, Table B15	Yes – see Section 12.6.1	T Yes - see Section 12.6.2
Contributions to economy of Nunavut and Canada	$92M annually during operations phase.	FEIS Section 4.21.4.8	None	N/A	N/A

12.1 AQUATIC ENVIRONMENT

The results of the 2018 aquatic ecosystem and physical environment monitoring programs were evaluated, and a comparison was made to the impacts predicted in the FEIS. The aquatic environment VECs identified in the FEIS were: surface water quantity, surface water quality, and fish/fish habitat.

The following sections:

- Summarize the planned mitigation measures taken into account prior to predicting residual impacts of the Project on freshwater VECs;
- Identify the predicted residual impacts;
- Assess the accuracy of the predictions (compare the measured impacts with monitoring results);
- Discuss the effectiveness of the monitoring program at comparing measurements to predicted impacts; and
- Summarize the effectiveness of the mitigation and provide recommendations for any additional required mitigation or adaptive management where impacts are being exceeded.

When effects are observed (i.e. exceedances of impact predictions) an analysis of baseline and year-over-year trends is presented to support decisions around supplemental mitigation or adaptive management measures.

Any known use of the monitoring data in regional monitoring initiatives is described.

12.1.1 Mitigation Measures

A summary of the planned mitigation measures to ensure impacts to surface water quantity and quality, and fish and fish habitat are consistent with impact predictions, along with a commentary on implementation in 2018 is provided in Table 12.2.

Table 12.2. Mitigation measures described in the FEIS to reduce impacts of the project to water quantity, water quality, fish and fish habitat, and commentary on current implementation.

Planned Mitigation Measure (FEIS, Section 4.24.2.5)	**Implementation**
Reducing the intake of fresh water from the neighbouring lakes by recycling and reusing water where practicable	**Yes** - Meadowbank continues to recycle reclaim water for mill usage. In 2018, reclaim water usage was more than double freshwater intake (Section 4.1.1)
Implementing measures to avoid the contact of clean runoff water with areas affected by the mine or mining activities	**Yes** - Management of non-contact water occurs through use of established diversion ditches, which are monitored according to NWB Water License requirements (Section 8.5.3.1.2).
Collecting, transporting, and treating mine water, camp sewage, and runoff water that comes into contact with project activities, as necessary	**Yes** - A comprehensive management program for site contact water and sewage is ongoing as described in Section 8.5.3. Monitoring occurs according to NWB Water License requirements.

Managing potentially acid-generating or metal-leaching materials	**Yes** – Waste rock analysis and management according to acid-generating and metal-leaching potential is described in Section 5.1.
Monitoring quality of discharges	**Yes** – minesite effluent is monitored according to NWB/MDMER criteria, as described in Section 8.3.
Adjusting management practices if monitoring results indicate discharge quality does not meet discharge criteria	**Yes** – in cases where discharge criteria are not met, discharge is ceased until results are within acceptable limits. E.g. Section 8.3.1.3
Winter culvert installation	**N/A –** item not constructed in 2018
Sediment control (e.g. use of geotextile for Baker Lake marine barge landing facility)	**N/A –** item not constructed in 2018
Use of properly sized screens for freshwater intake	**N/A –** item not constructed in 2018
Use of riprap to stabilize shorelines around culverts and anchor pipes	**N/A –** item not constructed in 2018
Modification of the external surface of containment dikes	**Yes** - As described in the 2006 NNLP, dike faces below the water surface are constructed from low metal leaching iron formation rock. Dikes are capped with ultramafic rock above the water surface to minimize the potential for metals leaching.
~~Enhancement and improvement of connecting channels between lakes to enhance fish movement~~	No longer planned under updated DFO Fisheries Act Authorization NU-03-0191.3 (2013)
Treatment of effluent discharge	**Yes** – minesite effluent is monitored according to NWB/MDMER criteria, as described in Section 8.3, and treated as required for TSS prior to release
Discharge only during open water, not under ice (Attenuation Pond discharge to Third Portage Lake)	**N/A** - Attenuation pond discharge is no longer occurring
Construction of fish habitat compensation features (according to DFO Fisheries Act Authorization NU-03-0191.3, 2013)	**Yes** – construction of fish habitat compensation features as described in this document is ongoing. Monitoring is described in Section 8.8

12.1.2 Predicted Residual Impacts

In general, Meadowbank's water quality and quantity monitoring programs intend to meet the requirements of the NWB (Type A license) and Environment Canada MDMER criteria. As anticipated, the mine lay-out and infrastructure have changed since the FEIS was produced, and sampling locations have been adjusted accordingly. Overall, observed impacts to water quantity, water quality, fish and fish habitat measured in 2018 are within FEIS predictions or are not expected to result in adverse environmental impacts. See Tables 12.2, 12.3 and 12.4 for summaries.

12.1.2.1 Water Quantity

A summary of predictions for impacts to water quantity and the accuracy of these predictions (measured impacts) are provided in Table 12.3.

Water usage predictions were made during the FEIS to predict potential impacts to water levels in Third Portage Lake, Second Portage Lake, and Wally Lake. Modeling predicted the natural range of water levels in Third Portage Lake to be 133.82 – 134.19 masl, and the impact assessment indicated that this range would not be exceeded (Physical Environment Impact Assessment Report, 2005). Although these values accounted for 1-in-100 yr precipitation or drought events, prior to operation, water levels were already below this range when monitoring began (prior to any significant freshwater consumption) in 2009. Pumping rates of freshwater from Third Portage Lake remained well within license limits in 2018, and water levels do not appear to have changed significantly since monitoring began (2009) (see Figure 22). Although only one measurement of baseline water levels in Second Portage Lake was reported from 2005 in the FEIS (133.1 masl), making comparisons difficult, measured water levels since 2013 appear to be within this range (Figure 29).

Table 12.3. Predicted and measured impacts to water quantity. *when monitoring began in 2009, prior to significant freshwater use, the water level in TPL was already outside this range at 133.5 masl.

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted (2018)	Predicted Impact	Measured Impact (2018)
Altered (reduced) water levels in Third Portage Lake	Potentially high seepage rates (from lakes into pits)	Monitor pit seepage rates	Lake levels monitored	No change in lake level (modeled range = 133.82 – 134.19 masl*; 2009 measured = 133.5 masl)	133.55 – 133.86 masl (average = 133.67 masl)
	Freshwater consumption (Third Portage Lake)	Monitor freshwater use	Freshwater use monitored	0.53 M m^3/yr (Year 5 – 8; FEIS) NWB renewed water license and approved 2.35 Mm^3/yr until 2017 and 9.12 Mm^3/yr in 2018 through to expiry of license.	1,027.16 Mm^3
	Discharge from Portage Attenuation Pond	Monitor discharge volumes and timing	Discharge volumes monitored	458.4 Mm^3/yr (max)	No discharge in 2018
	Non-contact water diverted from Second Portage Lake drainage into TPL	Monitor discharge volumes of non-contact water	Lake levels monitored	No change in lake level (modeled range = 133.82 – 134.19 masl*; 2009 measured = 133.5 masl)	133.55 – 133.86 masl (average = 133.67 masl)
Altered water levels in Second Portage Lake	Potentially high seepage rates (from lakes into pits)	Monitor pit seepage rates	Lake levels monitored	Dike seepage rates predicted at 10^{-2} – 10^{-4} L/s/m of dike; Minor effect on lake level (baseline = 133.1 masl)	132.86 – 133.10 masl (average = 132.96 masl)
	Non-contact water diverted from Second	Monitor discharge volumes of	Lake levels monitored	Minor effect on lake level (baseline = 133.1 masl)	132.86 – 133.10 masl (average =

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted (2018)	Predicted Impact	Measured Impact (2018)
	Portage Lake drainage	non-contact water			132.96 masl)
Increased water levels in Wally Lake	Discharge from Attenuation Pond	Monitor discharge rates	Monitored discharge rates	Minimal increase in water levels. Total average annual discharge is approximately 456.45 Mm^3 during open water months	No discharge; Water levels within background 139.25 - 139.66 masl (avg. = 139.41 masl)

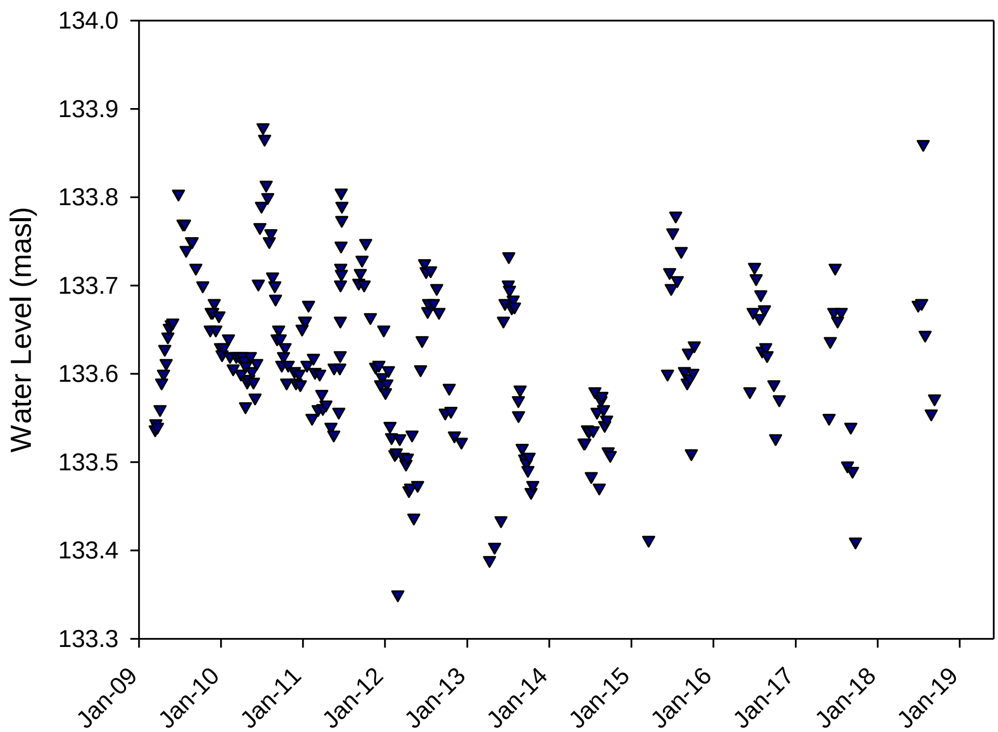


Figure 29. 2009 -2018 Measured water levels in Third Portage Lake.

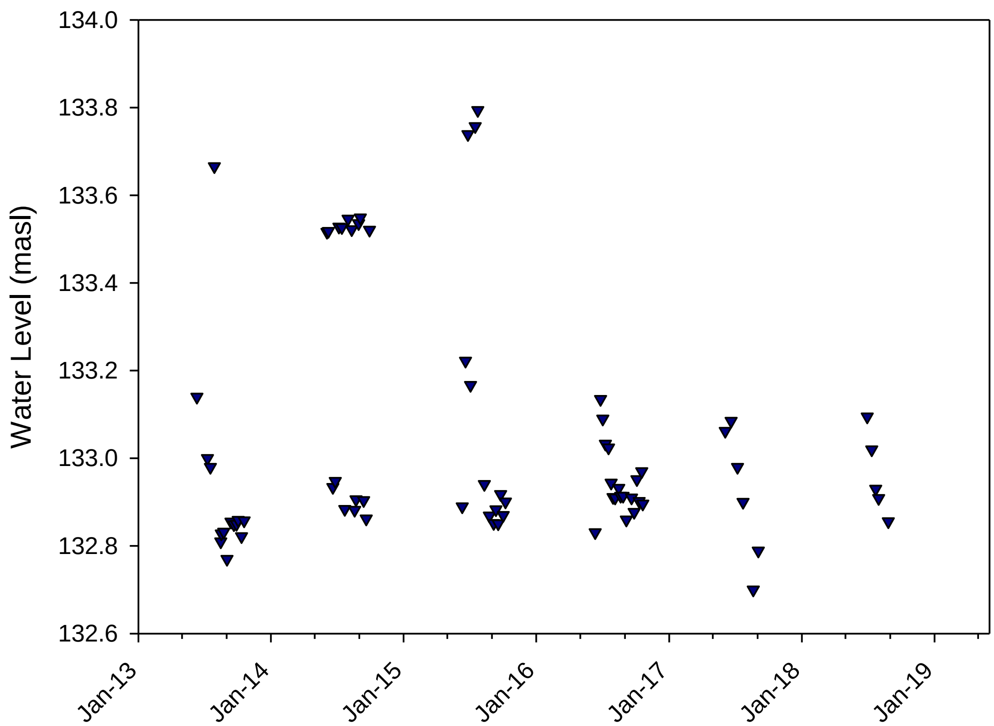


Figure 30. 2013 – 2018 Measured water levels in Second Portage Lake.

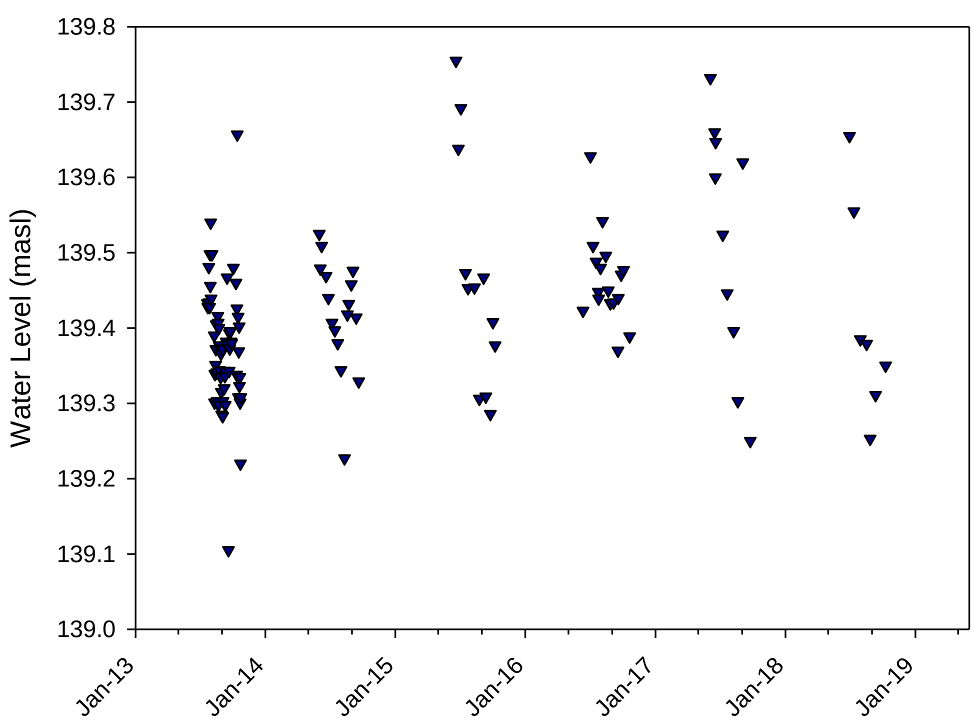


Figure 31. 2013 – 2018 Measured water levels in Wally Lake.

12.1.2.2 Water Quality

There are many monitoring programs conducted to evaluate water quality at Meadowbank. These are mainly a requirement of the Type A Water License as well as the federal MDMER program. They are designed to provide immediate feedback such that mitigation or adaptive management can be implemented. As outlined in the FEIS, the Core Receiving Environment Monitoring Program is intended to monitor large-scale (e.g. basin-wide) changes in physical and biological variables to evaluate potential impacts from all mine related sources in the receiving environment. It therefore serves as the most important monitoring program for evaluating short term and long term potential impacts to the aquatic environment. In 2016, Agnico Eagle implemented an updated CREMP plan in accordance with the terms of their renewed NWB water license (2AM-MEA1526) for the Meadowbank site. The 2018 CREMP report (Appendix 31) provides a comprehensive assessment of water quality monitoring for the receiving environment, with analysis of inter-annual trends, and a comparison to site-specific trigger values and FEIS predictions. Those results are summarized here.

Each year, information from the CREMP and other targeted programs is evaluated in an integrated manner and reported as the AEMP (Section 8.12.3 of this document) to determine any required changes to mitigation practices. The AEMP summarizes the results of each of the underlying monitoring programs, including the CREMP, reviews the inter-linkages among the monitoring programs; integrates the results, and recommends management actions.

Aspects of the mine that were identified in the FEIS as potentially leading to significant impacts during operations are summarized Table 12.3, along with results of the monitoring programs aimed at assessing these impacts. Note that this assessment focuses on comparing current measured effects with predictions made in the Physical Environment Impact Assessment Report (2005); it does not attempt to compare effects of all aquatic environment monitoring programs with respective threshold or trigger values developed for AEMP programs or to regulatory criteria imposed. For results of those assessments, see individual monitoring reports, or the summary provided under Section 8.12.3 of this report.

Overall, the FEIS predicted a “low” impact on the receiving environment water quality, which was designated by <1x change in CCME Water Quality Guidelines (CWQG), and no exceedances of MDMER/NWB Water License criteria. As described in Table 12.4, these predictions were not exceeded in 2018.

In addition, annual Meadowbank CREMP water chemistry data were compared to the maximum whole-lake average water quality modelling predictions for Third Portage, Second Portage, and Wally Lakes made in the FEIS (see 2018 CREMP report; Appendix 31). While direct comparisons were made, the difference in spatial focus (i.e., the CREMP at the basin scale and the water quality model at the whole-lake scale) warrants caution interpreting any differences. To that end, the assessment criteria outlined in the FEIS for defining the predicted magnitude of impacts to water quality was used to provide the appropriate context for interpreting the screening results as follows:

- **Negligible**: water quality concentrations are similar to baseline
- **Low:** concentrations are < 1x the CCME Water quality guideline (WQG)
- **Medium**: concentrations are between 1 and 10-times the CCME guidelines

- **High**: concentrations are less than MDMER but greater than 10-times the CCME guidelines
- **Very High**: concentrations exceed MDMER standards

Parameters with results commonly exceeding concentrations predicted in the FEIS in 2018 were: ionic compounds (calcium and magnesium), hardness, and total alkalinity. Chloride, fluoride, nitrate, and sulphate also exceeded the FEIS predictions for Third Portage Lake, Second Portage Lake, and Wally Lake in at least one sample. Most metals were below the predicted concentrations except for silicon (all three lakes), strontium (Third Portage Lake) and isolated instances of aluminum, copper, iron, manganese, and silver. Strontium consistently exceeded the model predictions for Third Portage Lake, but importantly did not exceed the CREMP trigger (95th percentile of baseline) indicating current strontium concentrations are representative of pre-development conditions. Since no parameters exceeding FEIS-modelled concentrations have effects-based threshold values (i.e. CCME criteria), and results for these non-criteria parameters exceeded baseline or trigger values but were below concentrations associated with adverse effects, CREMP water quality results were determined to be consistent with the “low” significance (i.e., <1x CCME WQG) rating applied to model predictions in the FEIS.

Table 12.4. Predicted and measured impacts to water quality

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted (2018)	Predicted Impact	Measured Impact (2018)
Impaired Wally Lake water quality	Vault attenuation pond effluent discharge; dike leaching	Effluent and receiving environment monitoring	Receiving environment: CREMP Effluent: MMER, Water License	Receiving environment: CREMP results <CWQG except arsenic and cadmium EfDfluent: <MMER	Receiving environment: CREMP results all <CWQG; For parameters without CWQG, no adverse effects expected. Effluent: No effluent discharged.
Impaired Second Portage Lake water quality	Portage Attenuation pond effluent discharge; dike leaching; (East Dike seepage)	Effluent and receiving environment monitoring	Receiving environment: CREMP Effluent: MDMER, Water License	Receiving environment: CREMP results <CWQG except cadmium Effluent: <MDMER, Water License	Receiving environment: CREMP results all <CWQG; For parameters without CWQG, no adverse effects expected. Effluent: <MDMER and Water License Criteria

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted (2018)	Predicted Impact	Measured Impact (2018)
Impaired Third Portage Lake water quality	Portage Attenuation pond effluent; dike leaching	Effluent and receiving environment monitoring	Receiving environment: CREMP (MDMER effluent monitoring not required)	CREMP results <CWQG except cadmium	Receiving environment: CREMP results all <CWQG; For parameters without CWQG, no adverse effects expected.

12.1.2.3 Fish and Fish Habitat

In addition to water quality and quantity, monitoring programs were developed to address the impacts of mining activities to fish and fish habitat. These are primarily guided by Fish Habitat Offsetting/ No Net Loss Plans (NNLP) and associated fisheries monitoring (e.g. CREMP, Habitat Compensation Monitoring Plan, blast monitoring) as set out in the DFO Fisheries Act Authorization for the mine site. Results of these programs are summarized in relation to FEIS predictions in Table 12.5, below.

All measured impacts to fish and fish habitat were within FEIS predictions. 2018 CREMP results (Appendix 31) indicated a possibility for increased sediment toxicity for benthic invertebrates in laboratory tests, but a complete weight-of-evidence analysis determined there are not currently unacceptable risks to the benthic community at this location. Further analysis is planned for 2019 to confirm results of laboratory sediment toxicity tests..

Table 12.5. Predicted and measured impacts to fish and fish habitat

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted (2018)	Predicted Impact in FEIS	Observed Impacts (2018)
Loss/impairment of fish habitat	Construction of temporary and permanent in-water features (e.g. TSF, dikes, pits).	Monitoring of compensation features per NNLP (targeted studies under AEMP for dike "pore water" (interstitial water) quality, periphyton growth, fish use).	Not required in 2018	Dikes will provide a medium for lower trophic growth; habitat for non-spawning life functions except Goose Island dike where spawning may occur.	N/A
	Construction of barge facility in Baker Lake	Annual monitoring of shoreline stability and integrity (proposed 2016)	CREMP monitoring at Baker Lake barge dock	Negligible impact	No impacts of barge activity on water quality, sediment quality, phytoplankton, benthic invertebrates observed to date (CREMP)
Reduced fish egg survival	Metals and particulates from dike leachate, effluent, and road dust. Blasting	Dike leachate: Targeted studies under AEMP ("pore water" (interstitial water) sampling during year 1 Effluent: Water quality monitoring under MDMER. Dust: Whole-lake water quality under CREMP	Dike leachate: Not required in 2018 Effluent: MDMER monitoring Dust: Whole-lake water quality under CREMP Blasting: Blast monitoring	Dike leachate: Dissolved metals may reduce fish egg survival and larval development during overwinter incubation. Effluent: < MDMER (2002) regulations Dust (whole-lake water quality under CREMP): negligible ecological effect, <CWQG for aquatic life (CCME) except cadmium (TPL), and arsenic and	Dike leachate: N/A Effluent: < MDMER Dust (whole-lake water quality under CREMP): CREMP results <CWQG. No exceedance of TSS triggers. Blasting: No exceedances of DFO overpressure guideline (50 kPa); no

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted (2018)	Predicted Impact in FEIS	Observed Impacts (2018)
		Blasting: Blast monitoring		cadmium (Wally Lake) Blasting: Most blasts will not exceed DFO overpressure guideline (50 kPa); no exceedances of PPV guideline (13 mm/s)	exceedances of PPV guideline (13 mm/s)
Mortality of fish and fish eggs	Blasting	Blast monitoring	Blast monitoring	Most blasts will not exceed DFO overpressure guideline (50 kPa); no exceedances of PPV guideline (13 mm/s)	No exceedances of DFO overpressure guideline (50 kPa); no exceedances of PPV guideline (13 mm/s)
	Worker fishing in project area, despite no-fishing policy; increased fishing in area due to AWAR	Worker fishing: Staff interviews AWAR fishing: Creel survey	Worker fishing: None AWAR fishing: Next monitoring in 2019	Unknown	Worker fishing: No observed impact. No worker had fished. AWAR fishing: N/A
	Accidental spills (e.g. fuel)	Event-based monitoring; spill emergency response plan	Spill Contingency Plan: All spills reported to Environment Department; monitoring spills during site inspections	Not defined	No offsite impact to any watercourses as a result of spills in 2018.
Fish stress, behavioural changes, avoidance	Increased concentrations of dissolved metals and TSS from dust	Dust: Whole-lake water quality monitoring under CREMP	Dust: Whole-lake water quality under CREMP	Dust (whole-lake water quality under CREMP): negligible ecological effect; <CWQG for aquatic life	Dust (whole-lake water quality under CREMP): CREMP results

Potential Impact	**Potential Cause(s)**	**Proposed Monitoring**	**Monitoring Conducted (2018)**	**Predicted Impact in FEIS**	**Observed Impacts (2018)**
	and effluent discharge	Effluent: Monitoring under MMER program	Effluent: MDMER monitoring	(CCME) except cadmium (TPL), and arsenic and cadmium (Wally Lake) Effluent: < MDMER criteria	<CWQG. No exceedance of TSS triggers. Effluent: < MDMER
Impaired lower trophic levels (incl. loss of phytoplankton, periphyton and benthos)	Leaching of metals from dikes	Targeted studies under AEMP (“pore water” sampling; periphyton sampling) during year 1	Not required in 2018	Dike faces will provide a medium for periphyton growth	N/A
	Sedimentation through dust/particulate dispersion (road dust, wind dispersal, terrain disturbance) and effluent discharge	Dust: Water quality monitoring through CREMP Effluent: MDMER monitoring	Dust: CREMP (water quality and lower trophic level monitoring) Effluent: MDMER monitoring	Dust: negligible ecological effect; CREMP results <CWQG for aquatic life (CCME) except cadmium (TPL), and arsenic and cadmium (Wally Lake) Effluent: Settling of TSS and altered sediment chemistry may impact benthos.	Dust (water quality and lower trophic level monitoring under CREMP): CREMP results <CWQG, no exceedance of TSS triggers, no mine-related impairment of phytoplankton, benthic invertebrate communities[6] Effluent: < MDMER

[6] While not attributed to dust or effluent, 2018 CREMP results indicated a potential for increased sediment toxicity in one receiving environment location (TPE). However, a complete weight-of-evidence assessment determined that currently, concentrations of metals at TPE are not posing risks to the benthic community Follow-up studies are planned in 2019..

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted (2018)	Predicted Impact in FEIS	Observed Impacts (2018)
Increased fish biomass	Release of nutrients in treated sewage	Nutrients, chlorophyll a, and phytoplankton monitoring through CREMP in TPL	Nutrients, chlorophyll a, and phytoplankton monitoring through CREMP in TPL	Increase in nitrogen concentrations; change in phytoplankton species in TPL	N/A - Treated sewage is disposed of in TSF, so potential for impact is removed.
Impaired fish passage along AWAR streams	Culvert installation	AWAR Fish Monitoring Report: (targeted monitoring study under AEMP - hoopnets at culvert crossings only; 1 year minimum)	Not required – program complete in 2011 after 5 years	Negligible residual impact on fish and their movements within streams and channels	N/A

12.1.3 Effectiveness of Monitoring Programs

The aquatic monitoring programs at Meadowbank were originally designed as part of the FEIS and adapted to meet the requirements of the NWB Type A License, Environment Canada regulations and DFO Fisheries Act Authorizations for the protection of the aquatic system. Beyond meeting the regulatory requirements, the numerous 2018 aquatic monitoring programs addressed nearly all relevant potential impacts to water quantity, water quality and fish/fish habitat identified in the FEIS, as demonstrated in Tables 12.3, 12.4, and 12.5.

One component that will be further documented in the future if possible to support this analysis is documentation regarding any onsite fishing. Currently, a no-fishing policy exists for workers, and no violations of this policy have been observed to date by the Environment Department.

12.1.4 Effectiveness of Mitigation and Recommendations for Additional Mitigation or Adaptive Management

Overall, the measured impacts to water quantity, water quality, fish and fish habitat appear to be within the FEIS predictions, or were not expected to result in adverse effects, indicating that the mitigation measures in place are effective.

As described in the 2018 CREMP report (Appendix 31), follow-up studies are planned in 2019 to assess sediment toxicity and metals bioavailability.

Based on this comparison to FEIS predictions, there are no other additional recommendations for supplemental mitigation or adaptive management related to water quality, water quantity, or fish/fish habitat.

12.1.5 Contributions to Regional Monitoring

In 2018, Agnico Eagle developed a suite of research programs as a component of fish habitat offsetting for the Whale Tail pit project. When complete, results of these studies are planned to be presented at various conferences and published in the peer reviewed literature, and will contribute to the scientific knowledge base. These projects are fully described in Section 8.8.2.4 of this report.

Similarly, Agnico partnered with Dalhousie University in their successful application for an NSERC CRD grant to fund a project aimed at assessing changes in the aquatic system around Baker Lake related to upgrades of the community wastewater treatment facility. This project will be ongoing over a 5 year period, beginning in 2019.

Agnico provides all raw fishout data to DFO scientists for use by any interested parties. At a regional level, the information, monitoring tools, monitoring data and modelling that is used at Meadowbank has been applied by Agnico Eagle and other consultants at other proposed projects in Nunavut including, the Meliadine Gold Project and Whale Tail Pit project.

Finally, Agnico Eagle Mines has participated as a technical advisory group member of the Inu'tutit project since 2014. The Inu'tutit Initiative is part of longer term plan that is being led by a secretariat of key players made up of the NGMP, KivIA, INAC and Nunavut Water Board (NWB), and is being implemented through partnerships between the KivIA, federal and territorial governments, industry (Areva Resources and Agnico Eagle Mines), the Hamlet of Baker Lake and eventually, universities and academic institutions. More specifically, the Kivalliq Inuit Association (KivIA) has partnered with Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) and the Nunavut General Monitoring Plan (NGMP) to develop an Aquatic Cumulative Effects Monitoring Program (CEMP) for the Baker Lake Basin under the auspices of the Inu'tutit Initiative.

12.2 TERRESTRIAL AND WILDLIFE ENVIRONMENT

The 2018 Wildlife Monitoring Summary Report (Appendix 45) provides a complete assessment of wildlife monitoring programs and a comparison to predictions of impacts made during the FEIS process. However, results are also summarized here, and a review of mitigation measures as planned in the FEIS is also provided.

The following sections:

- Summarize the planned mitigation measures taken into account prior to predicting residual impacts of the Project on wildlife VECs;
- Identify the predicted residual impacts;
- Assess the accuracy of the predictions (compare the measured impacts with TEMP thresholds);
- Discuss the effectiveness of the monitoring program at comparing measurements to predicted impacts; and
- Summarize the effectiveness of the mitigation and provide recommendations for any additional required mitigation or adaptive management where impacts are being exceeded.

When effects are observed (i.e. exceedances of impact predictions) an analysis of baseline and year-over-year trends is presented to support decisions around supplemental mitigation or adaptive management measures.

Any known use of the monitoring data in regional monitoring initiatives is described.

12.2.1 **Mitigation Measures**

FEIS-planned mitigation measures to limit impacts of the Project on terrestrial wildlife were originally described in the Terrestrial Ecosystem Management Plan (October 2005). This plan was most recently updated in December 2018 (Appendix 51) so mitigation measures as described in that document (Tables 4, and 6 – 10) were relevant and in practice in 2018.

12.2.2 Predicted Residual Impacts

For each VEC, a summary of predicted impacts and the accuracy of those predictions (observed impacts) as determined through various monitoring programs are provided in Table 12.6. Thresholds for the implementation of adaptive management, as developed in the Terrestrial Ecosystem Management Plan (a component of the FEIS), were used in this comparison because most impact predictions in the Terrestrial Ecosystem Impact Assessment were qualitative (other than loss of habitat area).

Overall, two Terrestrial Ecosystem Monitoring Program thresholds were exceeded or potentially exceeded in 2018 (onsite waterfowl mortalities; and sensory disturbance of caribou).

Table 12.6. Terrestrial impacts and associated effects predicted in the FEIS, proposed monitoring, actual monitoring (2018) and observed impacts (2018). Based on the 2018 Wildlife Monitoring Summary Report (Appendix 45). Measured impacts exceeding or potentially exceeding impact predictions/thresholds are indicated in grey

Potential Impact	Potential Cause(s)	Proposed Monitoring Methods	Monitoring Conducted (2018)	Threshold/ Prediction	Measured Impact (2018)
Vegetation (Wildlife Habitat)					
Habitat Loss	Mine site footprint, pits, roads, water management and collection systems	Ground Surveys, Mapping, GIS Analysis	Ground Surveys, Mapping, GIS Analysis	Mine Site – 1531 ha + 5% AWAR – 281 ha + 5%	Mine Site - 1,129 ha (73.7%) AWAR – 173 ha (61.6%)
Habitat Degradation by Contamination	Dust from roads, TSF, airstrip	Vegetation and Soil Samples (SLRA)	Not required in 2018	No excess mine-related risk	N/A
Ungulates					
Sensory Disturbance	Avoidance due to noise and activity (roads, airstrip, mine site)	Ground Surveys, Satellite-collaring	Satellite-collaring data; Road surveys; Daily and weekly pit and mine-site ground surveys; Incidental wildlife reporting; Motion sensing cameras	Avoidance of habitat more than 500 m from site; 1000 m from AWAR	Deflections noted when Caribou approach the road. Delayed crossing of roads.[7]
Vehicle Collisions	Vehicular or air traffic collisions	Ground surveys, Collision Reporting System	Ground surveys, Collision Reporting System, AWAR Road Surveys	One mortality per year	None
Habitat Loss and Degradation	Mine site footprint, pits, roads, water	Ground Surveys, Mapping,	Ground Surveys, Mapping, GIS	Growing – 531 ha of High Suitability	Growing – 372 ha (70%)

[7] Results of the ZOI analysis (see Section 12.2.5), which began in 2017 in partnership with the GN, will help to determine whether the impact prediction is no longer supported.

Potential Impact	Potential Cause(s)	Proposed Monitoring Methods	Monitoring Conducted (2018)	Threshold/ Prediction	Measured Impact (2018)
	management and collection systems	GIS Analysis	Analysis	Habitat + 10% Winter – 407 ha of High Suitability Habitat + 10%	Winter – 280 ha (68.8%)
Hunting by Baker Lake Residents	Improved access to hunting along the AWAR	Hunter Harvest Study	Not conducted – resumed in 2019	< 20% increase of historical harvest activities within the RSA; no significant impact to herds	N/A
Other Mine-related Mortality	Falling into pits, TSF or other means	Ground surveys	Ground surveys	One mortality per year	No mine-related mortalities
Exposure to Contaminated Water or Vegetation	Consumption of contaminated dust deposited on vegetation	Vegetation and Soil Samples (SLRA)	Not required in 2018	No excess mine-related risk	N/A
Predatory Mammals					
Project-related Mortality	Vehicular or air traffic collisions, falling into pits, TSF or other means	Ground Surveys, Collision Reporting System	Ground Surveys, Collision Reporting System, AWAR Road Surveys	One mortality per year for large predatory mammals	One wolverine dispatched
Small Mammals					
Project-related Mortality	Vehicular or air traffic collisions, falling into pits, TSF or other means	Ground Surveys, Collision Reporting System	Ground Surveys, AWAR Road Surveys	Mortality of 100 individuals per year	Two artic hare mortalities along the AWAR
Habitat Loss and Degradation	Mine site footprint, pits, roads, water management and collection systems	Ground Surveys, Mapping, GIS Analysis	No monitoring as of 2018	No threshold as of 2018	N/A
Exposure to Contaminated	Consumption of contaminated	Vegetation and Soil	Not required in 2018	No excess mine-related	N/A

Potential Impact	Potential Cause(s)	Proposed Monitoring Methods	Monitoring Conducted (2018)	Threshold/ Prediction	Measured Impact (2018)
Water or Vegetation	dust deposited on vegetation	Samples		risk	
Raptors					
Healthy Prey Populations	Mine Footprint, dust and exhaust, noise (road, airstrip, mine site, Baker Lake barge area)	Vegetation and Soil Samples; PRISM plot surveys; ELC habitat mapping	Vegetation and Soil Samples	Thresholds are qualitative, and can be achieved through management and maintenance of vegetation and healthy prey communities.	N/A
Disturbance of Nesting Raptors	Noise and Activity	Active Nest Monitoring	Active Nest Monitoring	One nest failure per year	Threshold not exceeded
Project-related Mortality	Vehicle/ bird collisions	Ground Surveys, Collision Reporting System	Ground Surveys, AWAR Road Surveys, Collision Reporting System	One mortality per year	Threshold not exceeded
Waterbirds					
Disturbance of Nesting Waterfowl	Noise and Activity; dewatering	Waterfowl Nest Surveys	Waterfowl Nest Surveys; Ground Surveys	One nest failure per year	Threshold not exceeded
Habitat Loss and Degradation	Mine site footprint, pits, roads, water management and collection systems	Ground Surveys, Mapping, GIS Analysis	No monitoring as of 2018	No threshold as of 2018	N/A
Exposure to Contaminated Water or Vegetation	Mine site dust; Secondary containment structures and tailings storage facilities	Vegetation and Soil Samples	Not required in 2018	No excess mine-related risk	N/A
Project-related Mortality	Vehicle/ bird collisions	Ground Surveys,	Ground Surveys,	One mortality per year	Threshold not exceeded

Potential Impact	Potential Cause(s)	Proposed Monitoring Methods	Monitoring Conducted (2018)	Threshold/ Prediction	Measured Impact (2018)
		Collision Reporting System	AWAR Road Surveys		
Project-related Mortality	Mine site-related mortality	Surveys	Daily and weekly pit and mine-site ground surveys	One mortality per year	Two Long-tailed ducks found dead onsite
Other Breeding Birds					
Project-related Mortality	Vehicle/ bird collisions	Ground Surveys, Collision Reporting System	Ground Surveys, AWAR Road Surveys	50 project-related mortalities per year	Threshold not exceeded
Habitat Loss and Degradation	Mine site footprint, pits, roads, water management and collection systems	Ground Surveys, Mapping, GIS Analysis	Not required in 2018	No excess mine-related risk	N/A
Exposure to Contaminated Water or Vegetation	Mine site dust	Vegetation and Soil Samples	Not required in 2018	No excess mine-related risk	N/A
Changes in Breeding Bird Populations	Mine Footprint, dewatering dust and exhaust, noise (road, airstrip, mine site, Baker Lake barge area)	Breeding Bird Prism Plots and Transects	Next scheduled for 2019	For PRISM plots, threshold is > 20% from control plots. For transect surveys, threshold is reduced use beyond 100 m of road centerline.	N/A

Since onsite waterbird mortality occurred beyond FEIS thresholds in 2018 (death of two ducks after apparently flying into a building), an assessment of historical trends for this component was conducted. In 2017, no onsite waterbird mortalities were reported. In 2016, a dead juvenile Merganser duck was caught in gill nets during the Phaser Lake fish-out program. In 2015, two mortalities occurred; a dead duck was found outside a building, and a dead Canada Goose was found in the tailings pond. None were killed in 2014, 2013, 2012 or 2011. Based on this data, there is no clear trend towards increasing mortalities of waterbirds on the Meadowbank site, as determined through minesite surveys.

Potential disruption of caribou movements due to the Meadowbank AWAR was first reported in 2015, and analysis of the data are ongoing. Most 2018 Caribou activity was observed during the spring migration requiring numerous road closures and restrictions along the Meadowbank AWAR and the haul roads. The roads were also observed to be deflecting many of the collared Caribou during the spring, late summer, and fall seasons. Although 2017 collar data showed fewer road-related effects, 2015 and 2016 collar data also observed that the AWAR appeared to be altering natural movement patterns of collared Caribou. Agnico Eagle and regulatory agencies are committed to conducting more detailed analyses of Caribou monitoring data, satellite collar data, hunter harvest activity, and other potential influences on Caribou movement and migration to adaptively manage and minimize project-related effects on Caribou (see Section 12.2.5, ZOI study description). Agnico Eagle will also explore the link between Caribou road crossings and road closures.

12.2.3 Effectiveness of Monitoring

Current monitoring programs are effectively able to measure impacts as they relate to established threshold levels. The monitoring plan was recently updated (December, 2018).

12.2.4 Effectiveness of Mitigation and Recommendations for Additional Mitigation or Adaptive Management

As summarized in Table 12.6, two Terrestrial Ecosystem Monitoring Program thresholds were exceeded or potentially exceeded in 2018 (minesite waterbird mortalities, and sensory disturbance of caribou related to the AWAR).

No specific new mitigation or adaptive management was recommended in relation to waterbird mortalities but the causes of death were investigated.

Results of the ZOI analysis (see Section 12.2.5), which began in 2017 in partnership with the GN, will help to determine whether the impact prediction for caribou related to sensory disturbance is no longer supported. In the meantime, as described in the Wildlife Monitoring Summary Report (Appendix 45), to manage impacts of sensory disturbance to Caribou, Agnico Eagle's Environment Department should continue to closely monitor Caribou movement in the weeks leading up to spring and fall migrations using the latest available satellite-collaring and monitoring data (e.g., road and HOL surveys) as well as incidental reports from staff. As in previous years, notification and announcements, staff re-education, specific dispatch protocols, and temporary road closures should continue to be implemented, as a proactive adaptive management strategy. Where applicable, Caribou management and monitoring should be conducted according to protocols outlined in the 2018 TEMP, including continued use of a decision tree. Issues and concerns that arise should be discussed with regulatory personnel and during Terrestrial Advisory Group (TAG) meetings to ensure that a balance is achieved between Caribou protection and conservation and mine operation.

Otherwise, the measured impacts to terrestrial habitat and wildlife appear to be within the FEIS predictions, indicating that the mitigation measures in place to reduce impacts to other terrestrial wildlife VECs are effective.

12.2.5 Contributions to Regional Monitoring

Meadowbank continues to contribute to the GN DOE caribou collaring program which started in 2008.

Collaring was originally scheduled to commence in 2007 but was postponed for one year due to logistical constraints. Seven deployments, with a total of 117 collars, have been completed in the area around Baker Lake since Agnico Eagle became involved in the collaring program. The following numbers of collars were successfully deployed since 2008:

- 9 collars (Agnico Eagle) in May 2008;
- 21 collars (shared by Agnico Eagle and AREVA) in November 2009;
- 13 collars (Agnico Eagle) in April 2011;
- 15 collars (shared by Agnico Eagle and AREVA) in April 2013;
- 10 collars (Agnico Eagle) in April 2015; and
- 13 collars (Agnico Eagle) in May 2016.
- 36 collars (Agnico Eagle) in April 2018

In early 2011, Meadowbank contributed additional funding toward the GN-led program to estimate the number of breeding females in the Beverly herd of taiga-wintering barren-ground caribou.

In 2017, Agnico Eagle finalized discussions with the GN and entered into a renewed Memorandum of Understanding (MOU) to commit to another term contribution in support of the regional GN caribou monitoring program. This agreement will continue to assist the GN- DOE- Wildlife branch in directing the implementation, data analysis and management of caribou populations in the Kivalliq region.

In addition, in 2017 Agnico Eagle worked with the GN to evaluate the Zone of Influence of the Meadowbank Mine, as it relates to caribou. Seasonal ranges are important to understand as Barren-ground caribou exhibit migratory behaviour between calving and wintering areas. Migratory animals use a variety (seasonal) of habitats to meet life-history requirements as they move across the landscape and sensory disturbance from development is hypothesized to reduce selection of preferred habitats. In 2017, in collaboration with Agnico Eagle staff, Golder biologists and statisticians worked to determine a zone of influence for the Meadowbank mine, or evaluate if it is affecting a large number of individuals. It is predicted that reduced use of preferred habitats should reduce herd size (from lower survival and reproduction). Data analysis was completed and hypotheses were tested, documents were provided to regulators and reviewed, presentations were made at the GeoScience Forum and publications are expected in 2018. To reach consensus on research projects, needs for future monitoring and research, gain approval and ensure consistent endpoints of success, a Terrestrial Advisory Group (TAG) was also created and a series of workshops were developed.

Finally, Agnico is also working with raptor researcher Dr. Alastair Franke from the University of Alberta to document presence of raptors in the Meadowbank area. Dr. Franke's Arctic Raptors group will be tracking changes that may occur as a result of mining activity and sharing results across the scientific community through publications.

12.3 NOISE

While noise generation was predicted in the FEIS for many minesite components, a significant effect of noise (disturbance of wildlife; reduced habitat effectiveness) was only associated with three components:

pit development, the mine plant and the airstrip. Noise monitoring was therefore proposed in association with pit development, waste rock, tailings handling and the mill.

The following sections:

- Summarize the planned mitigation measures taken into account prior to predicting residual impacts of the Project on area noise levels;
- Identify the predicted residual impacts (i.e. predicted sound levels at monitoring locations);
- Assess the accuracy of the predictions (compare the measured sound levels with FEIS predictions);
- Discuss the effectiveness of the monitoring program at comparing measurements to predicted impacts; and
- Summarize the effectiveness of the mitigation and provide recommendations for any additional required mitigation or adaptive management where impacts are being exceeded.

When effects are observed (i.e. exceedances of impact predictions) an analysis of baseline and year-over-year trends is presented to support decisions around supplemental mitigation or adaptive management measures.

Any known use of the monitoring data in regional monitoring initiatives is described.

12.3.1 **Mitigation Measures**

FEIS-planned mitigation measures to limit impacts of the Project on area noise levels were originally described in the Air Quality and Noise Management Plan (October 2005). This plan was most recently updated in June 2018 (Appendix 51) so mitigation measures as described in that document were relevant and in practice in 2018. Measures are generally consistent between the FEIS version and updated management plan.

A summary of the planned mitigation measures to ensure impacts to area noise levels are minimized is provided in Table 12.7. In the future, a commentary on current-year implementation will be provided as necessary in this table.

Table 12.7. Mitigation measures described in the Noise Abatement and Monitoring Plan (June, 2018) to reduce impacts of the project on area noise levels.

Noise Source	**Planned Mitigation Measure** (Noise Abatement and Monitoring Plan, June 2018)
Road traffic (mine site, AWAR) and Haul Roads operation	• During maintenance, check that noise abatement devices are in good order (e.g., brakes, exhaust mufflers, engine hoods) • Enforce speed limits • Use shallow slopes for haul road • Educate truck drivers about the characteristics of diesel engines (i.e., that the flat torque characteristic allows ascending an incline in a higher gear, which is a less noisy operation)

Noise Source	**Planned Mitigation Measure** (Noise Abatement and Monitoring Plan, June 2018)
	• Keep road surfaces in good repair to reduce tire noise • Avoid prolonged idling • Avoid trucking operation during night time on access road, when possible
Air traffic (Meadowbank)	• Avoid low altitude flights (not lower than 610 m in sensitive bird/wildlife areas), except on take-off and landing • Restrict air traffic to daytime hours except for emergencies
Impact equipment (pile drivers, jack hammers, drills, pneumatic tools)	Avoid operating numerous pneumatic tools at the same time, and spread operation throughout working periods
Stationary equipment (compressors, generators, pumps)	Keep equipment in good condition
Blasting	• Use delays, both surface and down hole • Preference for daytime blasting • Blasting in depressed pits (normal production practice)
Outdoor material handling equipment (crushers, concrete mixers, cranes)	• Place crushers in sheltered/enclosed locations if possible • Maintain equipment in good working condition • Turn equipment off when not in use if practicable
Earth moving equipment (trucks, loaders, dozers, scrapers)	• Aim to restrict equipment age so only newer, more efficient machinery will operate onsite • Operate equipment within specification and capacity (i.e., don’t overload machines) • Use noise abatement accessories such as sound hood and mufflers
Primary plant facilities (gyratory primary crusher, SAG mill, ball mill, power plant)	• Provide building with walls absorbing noise • Maintain equipment on a regular basis, replace worn parts, lubricate as required • Provide diesel plant units with efficient intakes and exhaust silencers • Use conveyor system with low noise output, paying particular attention to rollers • Enclose conveyors where necessary
Utilities and services	• Ensure that a rotating biological contactor treatment system operates quietly • Dump solid waste behind barriers

12.3.2 Predicted Residual Impacts

Table 12.8, below, indicates the accuracy of FEIS predictions for area sound levels based on results of monitoring conducted in 2018 (measured sound levels). Since the potential impacts of Project-related noise were all identified as wildlife disturbance, the accuracy of these predictions is also monitored through the terrestrial environment monitoring programs, as discussed in Section 12.2.

For all sites and monitoring dates with available data, values measured in 2018 were lower than those predicted in the FEIS documents, except one datapoint for R5. For this station, FEIS predictions assumed that all one-hour Leq values would not exceed 57 dBA. In 2018, this prediction was exceeded for one of the 22 monitored hours, with an Leq of 58 dBA (4-5pm hour, July 16). The dataset was reviewed, and sound levels were generally well below 57 dBA during the monitoring period (Leq daytime of 49.5 dBA). Within the 4-5pm hour, two peaks above the predicted hourly Leq value occurred, lasting a total of 6 minutes. It is possible these were due to animal interference or a helicopter fly-over. Since the exceedance only occurred for one of twenty-two time-points and was not audibly different from the predicted value (<3 dBA difference), the event was not investigated further.

However, 24-h Leq measurements since 2009 were reviewed for all monitoring stations to understand if any trends towards increasing noise levels above FEIS predictions are occurring for any location on site (Figure 32). The upper level of predicted values is shown for R1 – R4. No prediction with respect to a 24h Leq was made for R5. As shown in this figure, there is no clear trend towards increasing sound levels at any site, with the highest sound levels generally occurring in 2012. Although no predictions were made regarding the 24-h Leq for R5, a decreasing trend is seen for noise levels at this station since 2012. Further analysis of trends over time for different averaging times is presented in the 2018 Noise Monitoring Report (Appendix 44).

Table 12.8. Comparison of 2018 measured sound levels with those predicted in FEIS documents (Cumberland, 2005). *Values interpreted from noise level contour plots. **For the R5 location (all-weather access road), predictions were made regarding the maximum 1-hr L_{eq} value only. Measurements exceeding impact predictions are shaded grey.

Site	Dates (2018)	FEIS Predicted Value (dBA)*	2018 Measured Value	
			$L_{eq, day}$ 7am-11pm (dBA)	$L_{eq, night}$ 11pm-7am (dBA)
R1	Jun 27 - 29	58-63	37.7	36.0
	Jul 18 - 20		45.2	38.0
R2	Jun 29 - Jul 2	58-63	42.0	35.1
	Jul 23 - 25		36.3	38.3
R3	Jul 9 - 12	49-53	36.2	41.6
R4	Jul 2 - 5	58-63	58.9	48.5
	Jul 25 - 27		34.8	39.8
R5	Jul 5 - 7	All 1 hr L_{eqs} < 57**	All <57	All <57
	Jul 16 - 18		1 @ 58	All <57

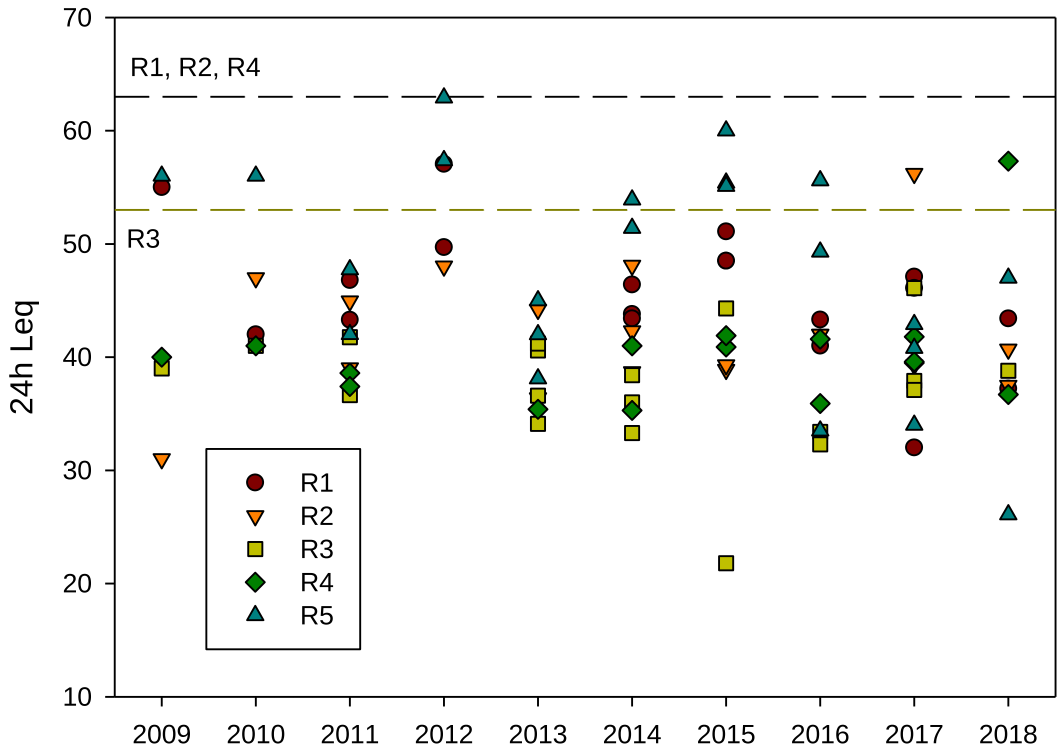


Figure 32. L_{eq} values calculated from filtered data for 24 h averaging times at locations R1 – R5 on the Meadowbank site in surveys from 2009 - 2018. Dashed lines indicate maximum predicted sound levels in the FEIS for each location (24-h L_{eq} prediction not available for R5).

12.3.3 Effectiveness of Monitoring

By monitoring sound levels at five locations around the minesite for two 3-4 day periods annually, the current monitoring program provides a conservative assessment of the accuracy of predicted noise levels. The measured values can be compared to those predicted in the FEIS for similar locations, in order to effectively comment on whether predictions are being exceeded.

Impacts of mine-related activities (including noise) on wildlife are also monitored through the Terrestrial Ecosystem Monitoring Program (TEMP), as described in Section 12.2.

12.3.4 Effectiveness of Mitigation and Recommendations for Additional Mitigation or Adaptive Management

Overall, impact predictions are not being exceeded so the mitigation measures in place to reduce impacts of the Project on area noise levels appear to be effective. No additional mitigation or adaptive management actions are therefore recommended at this time.

12.3.5 Contributions to Regional Monitoring

In 2018, Meadowbank has not specifically contributed to any regional monitoring programs for noise.

12.4 AIR QUALITY

A review was conducted of the predicted impacts to air quality identified in the FEIS. While dust generation or air emissions were predicted for many minesite components, a significant effect on terrestrial and aquatic environments was only associated with three components (pit development, the mine plant and the waste rock and tailings facilities).

The following sections:

- Summarize the planned mitigation measures taken into account prior to predicting residual impacts of the Project on area air quality;
- Identify the predicted residual impacts (i.e. predicted concentrations at monitoring locations);
- Assess the accuracy of the predictions (compare the measured sound levels with FEIS predictions);
- Discuss the effectiveness of the monitoring program at comparing measurements to predicted impacts; and
- Summarize the effectiveness of the mitigation and provide recommendations for any additional required mitigation or adaptive management where impacts are being exceeded.

When effects are observed (i.e. exceedances of impact predictions) an analysis of baseline and year-over-year trends is presented to support decisions around supplemental mitigation or adaptive management measures.

Any known use of the monitoring data in regional monitoring initiatives is described.

12.4.1 Mitigation Measures

A summary of the planned mitigation measures for air quality (per Air Quality and Noise Management Plan, 2005) is provided in Table 12.9. A complete review of the implementation measures will be provided in 2019.

Table 12.9. Mitigation measures described in the Air Quality and Noise Management Plan (October, 2005) to reduce impacts of the project on area air quality, and commentary on current implementation.

Emission Source	**Planned Mitigation Measure** (Air Quality and Noise Management Plan, 2005)	**Implementation**
Plant Production Facilities	Select the diesel power plant engines with low NOx emissions to prevent ozone formation and with low hydrocarbon emissions to lower GHG emissions	- NA

	Use low sulphur content diesel fuel to mitigate SO2 emissions	- Use of summer fuel
	Collect and vent any process emissions (flotation, CIP circuit, carbon treatment, gold refining, and cyanide detoxification) into the atmosphere	- All process enclosed in the mill facility except leach tank
	Design all stacks using good engineering practice (including accessible sampling ports and Adequate height) to ensure the required dispersion to meet ambient air quality objectives	- Design to meet engineering practice
	Implement fleet maintenance program to ensure that all diesel-powered equipment will operate efficiently, thereby reducing air emissions	- Preventive maintenance per manufacture recommendation
	Install dust filters at the primary crusher building and at fine grinding facilities (SAG mill and ball mill) and provide dust suppression equipment (dust covers, sonic sprays, etc.)	- Filter installed at major dust generating equipment
	Install enclosure of feed conveyor to avoid fugitive emissions during windy weather	- All conveyer are enclosed
	Provide crushed ore stockpile enclosure to limit any dust to indoor environment	- Enclosed in a dome
Transportation	Impose vehicle speed limit on Vault haul road to mitigate fugitive dust and reduce engine emissions	- Speed limit enforcement on Vault Haul Road and AWAR
	Apply dust suppressants (water, calcium chloride) to haul and service roads during dry weather to mitigate fugitive dust	- Dust suppressant apply on mine site and roads
	To reduce vehicle emissions, do not let motors idle, except when necessary	- No idle policy implemented - Application of the policy followed by Environment Department - Reminder of the policy sent as needed to all employees
	Upgrade road-surfacing materials using local coarse rocky aggregates	- Mine site road surfaced with NPAG waste rock material
Blasting & Waste Disposal	Limit blasting to calm days or use delay blasting technique; natural	- Blasting follow the approved Blast Monitoring Program

	mitigation to take place when mining pits are from 85 to 175 m below the ground level; ore and waste to be coarse run-of-mine muck not prone to generating excessive dust	
	Cover dewatered tailings with non-potentially acid-generating (non-PAG) aggregates to control wind erosion	- Progressive reclamation of the North Cell Tailings Pond ongoing with a cover of NPAG material
Miscellaneous	Provide pressure valves to control fuel vapour fugitive emissions from the storage tanks	- Installed at all locations
	Use water spray instead of pneumatic flushing while cleaning equipment and working areas when temperature is above the freezing point	- All machine cleaning is done inside shop (wash bay)
	Use site-generated mineral material (dirt, aggregate, etc.) to cover disposed solid waste at the waste dump	- Waste dump is located in the Portage Waste Rock Facility and is covered with waste rock created by mining activities
	Select waste incinerator with build-in emission control system (secondary combustion chamber, catalytic converter, etc.) and install a stack to disperse emissions to concentrations below ambient air quality objectives	- Construction of the incinerator included a secondary combustion chamber. - Annual testing of the incinerator stack to confirm compliance with applicable limit
	Apply vegetation cover on stripped areas and long-term stockpiles	- Natural revegetation to occur during the reclamation phase - Revegetation option to be considered in the final Closure Plan

12.4.2 Predicted Residual Impacts

Table 12.10 below, summarizes the residual predicted impacts to air quality, associated effects, monitoring measures proposed in the FEIS, and results of monitoring conducted in 2018.

In the FEIS, air quality modeling was conducted for fugitive dust in three size fractions ($PM_{2.5}$, PM_{10} and TSP) originating from the TSF, WRSF, and ore stockpile, for 24h and annual averaging times. Deposition rates for dust from these sources were also calculated ($g/m^2/30d$). However, contour plots were only provided for TSP and deposition rates. Otherwise, only maximum ground level concentrations were described. In addition, modeling was conducted for criteria pollutants (CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$) emitted from the power plant and mobile sources for 1h, 24h and annual averaging times, and concentration contour plots were provided for these analyses.

The main monitoring program for air quality recommended in the FEIS is static dustfall, which is being continuously monitored at four locations around the minesite. In addition, Agnico Eagle conducts monitoring of TSP, PM_{10}, $PM_{2.5}$ and NO_2, in accordance with the Air Quality and Dustfall Monitoring Plan. Carbon monoxide and sulphur dioxide were not required to be monitored as part of the program developed by Agnico Eagle in consultation with regulatory agencies.

Based on available FEIS modelling results, the following predicted values were able to be compared to measured values: NO_2 (annual average), $PM_{2.5}$, and PM_{10}. Monitoring results for these parameters are considered adequately comparable to FEIS predictions, since modelling included all reasonably significant emission sources for these parameters. FEIS predictions for TSP and dust deposition (30 d rate) were not compared to field measurements (i.e. monitoring results) since only emissions from three specific point sources were required to be modeled (TSF, WRSF, ore stockpile). Results of TSP and dustfall monitoring are provided in the 2018 Air Quality and Dustfall Monitoring Report (Appendix 39), along with comparisons to regulatory guidelines and historical measurements.

Even for those measured parameters which are comparable to FEIS predictions (NO_2, $PM_{2.5}$, PM_{10}), it should still be noted that while field monitoring captures emissions from all sources at once, as well as background sources, the FEIS presents modeled outputs from combinations of specific sources as described above. Therefore, accuracy of these quantitative predictions cannot specifically be assessed through field monitoring. However, if measured concentrations or deposition rates are lower than predicted values, it can be concluded that FEIS predictions are not being exceeded. In some cases, as described below, measured or estimated background concentrations were able to be added to predicted values to facilitate the comparison.

The following specific methods were used:

- Modeled values for suspended particulates and deposition rates were obtained for the two air quality monitoring locations (DF-1 and DF-2) from the FEIS Air Quality Impact Assessment Figures 6.2 – 6.24. PM_{10} values were derived from Figures 6.7 and 6.8, based on references in the text (Table 6.1), although these figures are labelled as SP. Model values for a TSF size of 960x560m were used in the comparison.

- A recent impact assessment for the Whale Tail Pit project at Meadowbank calculated background values for $PM_{2.5}$ of 6.7 and 3.6 $\mu g/m^3$ for 24-h and annual averaging times, respectively (Whale Tail Pit EIS, Appendix 4-A). No background data was available for other size classes of suspended particulates, but these $PM_{2.5}$ values were added to predicted concentrations of $PM_{10}$for the comparison, since $PM_{2.5}$ forms a subset of PM_{10}.

- For NO_2, modeling results were only provided in the FEIS for the maximum predicted ground-level concentration, which occurred adjacent to the power plant. The closest NO_2 monitoring station (DF-2) is at a distance of approximately 1 km southwest (cross-wind) from this location.

Despite the generally conservative nature of these comparisons, no exceedances occurred for NO_2, $PM_{2.5}$, or PM_{10}. In addition, GHG emissions were below the predicted value.

Table 12.10. Potential causes of air quality concerns, monitoring measures proposed in the FEIS, and results of monitoring conducted in 2017. *See explanation in Section 12.4.1. Any exceedances are bolded.

Potential Cause(s)	Proposed Monitoring (FEIS)	Monitoring Conducted (2018)	Max. Predicted Value (FEIS) + Est. Partial Background*	Measured Value (2018)
Generation of dust during placement of dike material	Static dustfall	N/A (no dikes constructed)	-	-
Generation of dust from exposed lake sediment	Static dustfall	Static dustfall, NO_2 (four locations) and suspended particulates (two locations)	NO_2 (ppb; annual avg.) = 4.97 $PM_{2.5}$ (µg/m^3; 24 h avg.): DF-1: 20+6.7 = 26.7 DF-2: 10+6.7 = 16.7 $PM_{2.5}$ (µg/m^3; annual avg.) DF-1: 1+3.6 = 4.6 DF-2: 0.5+3.6 = 4.1 PM_{10} (µg/m^3; 24 h avg.): DF-1: 20+6.7 = 26.7 DF-2: 40+6.7 = 46.7	NO_2 (ppb; annual avg.; DF-2) = 1.81 $PM_{2.5}$ (µg/m^3; 24 h avg.): DF-1: 0/16 samples > 26.7 DF-2: 0/45 samples > 16.7 $PM_{2.5}$ (µg/m^3; annual geometric mean) DF-1: 0.2 DF-2: 1.4 PM_{10} (µg/m^3; 24 h avg.): DF-1: 0/16 samples > 26.7 DF-2: 0/45 samples >46.7
Generation of dust and gases from blasting, excavation etc.	Static dustfall			
Generation of dust from material deposited on waste rock pile or tailings	Static dustfall			
Generation of dust and emissions from development, maintenance and use	Static dustfall			
Generation of dust and emissions from development, maintenance and use of roads	Static dustfall	As above, plus AWAR targeted study	As above for site. For AWAR: Not quantitative.	Site: as above. AWAR: Not measurable.
Release of pollutants from incineration	Maintain scrubbers; report emissions	GHG emissions reported	190,768 t CO_2 equivalent	186,122 t CO_2 equivalent

To provide a more complete picture of trends in monitored particulates, a review of historical values in comparison to guidelines and FEIS predictions is provided in Figures 33 and 34 below. As demonstrated, no trends towards increasing dust generation or deposition are apparent, since monitoring began in 2012. As described above, baseline concentrations were not measured. While occasional exceedances of FEIS predictions have occurred historically, these comparisons are considered conservative (particularly for PM_{10} where only partial background concentrations are included) and overall impact predictions appear to be supported by the monitoring results.

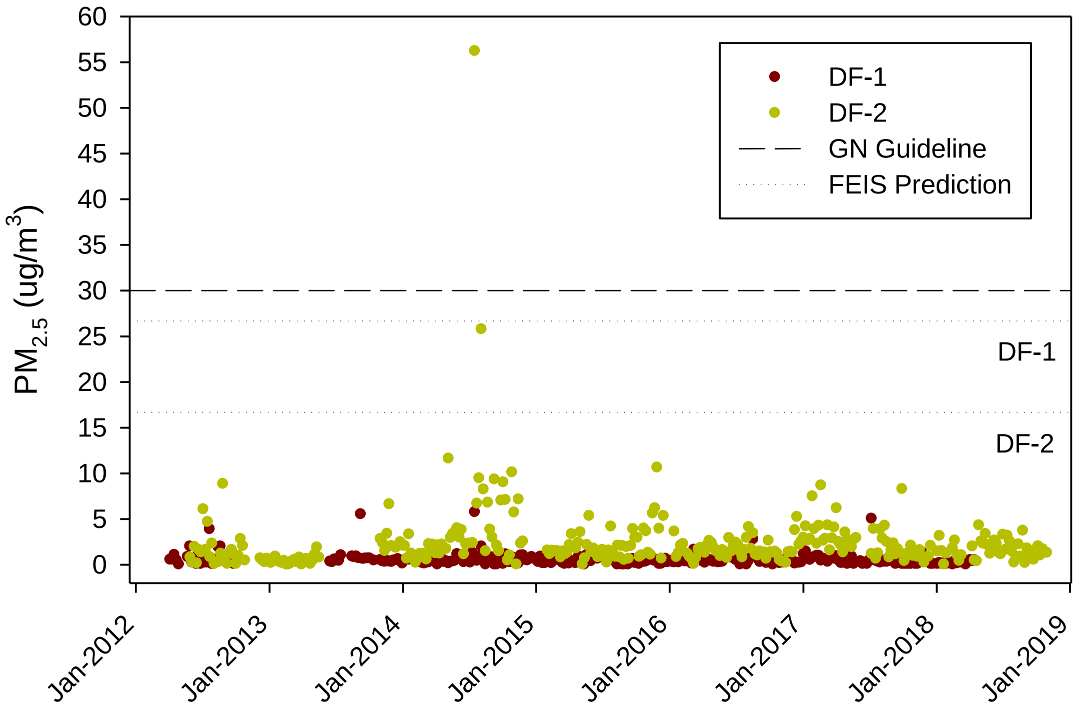


Figure 33. 24-h average concentrations of PM2.5 at Meadowbank stations DF-1 and DF-2. Dashed line indicates the 24-hr average GN guideline for ambient air quality. Dotted lines indicate FEIS model predictions + background (see discussion, Section 12.4.2).

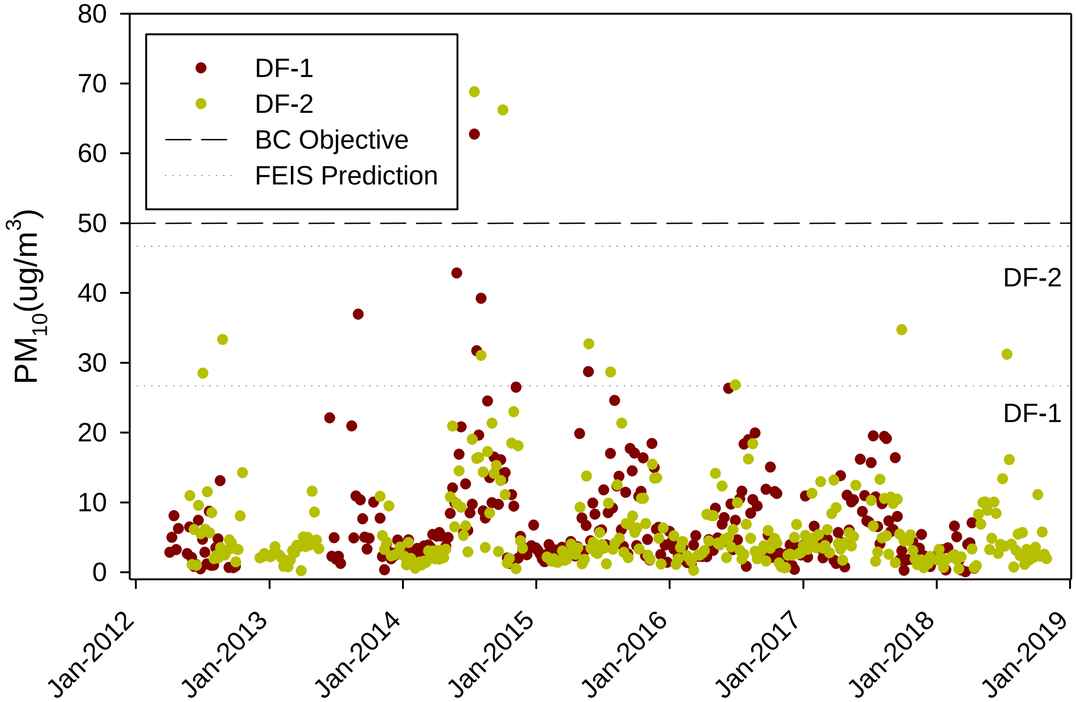


Figure 34. 24-h average concentrations of PM10 at Meadowbank stations DF-1 and DF-2. Dashed line indicates the 24-hr average GN guideline for ambient air quality. Dotted lines indicate FEIS model predictions + background (see discussion, Section 12.4.2).

12.4.3 Effectiveness of Monitoring

Impacts to air quality were predicted in the FEIS through standard modeling procedures, which predict concentrations of criteria contaminants emitted from a designated source. Since field monitoring identifies concentrations occurring from the combination of all sources (including background), it is difficult to compare results of the air quality monitoring program with predicted values. Furthermore, while concentration contour plots were provided in the FEIS for several parameters (allowing for interpolation of predicted values at current monitoring stations), only maximum predicted ground-level concentrations were provided for others.

Air quality monitoring results are therefore more effectively compared to established regulatory guidelines and standards (as in the 2018 Air Quality Monitoring Report), which in all cases are higher than predicted concentrations at the current monitoring stations.

12.4.4 Effectiveness of Mitigation and Recommendations for Additional Mitigation or Adaptive Management

Overall, impact predictions are not being exceeded so the mitigation measures in place to reduce impacts of the Project on area air quality appear to be effective. No additional mitigation or adaptive management actions are therefore recommended at this time.

12.4.5 Contributions to Regional Monitoring

In 2018, Meadowbank has not contributed to specific regional air quality monitoring programs, but all data generated through the air quality monitoring program is publicly available.

12.5 PERMAFROST

The following sections:

- Summarize the planned mitigation measures taken into account prior to predicting residual impacts of the project on permafrost;
- Identify the predicted residual impacts (i.e. predicted concentrations at monitoring locations);
- Assess the accuracy of the predictions (compare the measured impacts on permafrost due to specific mine activities in 2018 with FEIS predictions);
- Discuss the effectiveness of the monitoring program at comparing measurements to predicted impacts; and
- Provide recommendations for any additional required mitigation or adaptive management where impacts are being exceeded.

When effects are observed (i.e. exceedances of impact predictions) an analysis of baseline and year-over-year trends is presented to support decisions around supplemental mitigation or adaptive management measures.

Any known use of the monitoring data in regional monitoring initiatives is described.

This information is based on the 2018 Geotechnical Inspection Report (Appendix 7), which reviewed instrument data collected between September 2017 and August 2018.

12.5.1 Mitigation Measures

A summary of the planned mitigation measures for permafrost during the current operations phase of the project (FEIS Physical Environment Impact Assessment Report (2005), Table C.2) along with implementation in 2018 is provided in Table 12.11. Mitigation measures proposed for operations-phase components which have already occurred (e.g. dewatering) or those associated with design-phase planning are not included.

Table 12.11. Mitigation measures described in the FEIS, Appendix B (October, 2005) to reduce impacts of the project on permafrost, and commentary on current implementation.

Project Component	**Planned Mitigation Measure** (FEIS Section 4.24.2.4)	**Implementation**
Waste Rock Storage	Schedule placement of waste rock on thaw-sensitive polygons during winter months, possibly in conjunction with proactive measures to enhance ground chilling prior to placement (e.g. snow removal and/or compaction); use flatter side slopes	- Annual geotechnical inspection completed by third party - Annual revision of the Waste Rock and Tailings Management Plan

Tailings Storage Facility	Management of ice entrapment	- Follow up done on ice entrapment and best practices
Ditches (roads, airstrip, contact water)	Silt fences as required to manage sediment loss; rock aprons as required to slow the rate of thaw penetration and stabilize the underlying soils	- Silt fences not required as of yet
Freshwater intake & pipeline	Use insulated pipe with heat tracing; elevate pipeline across thaw sensitive terrain	- Insulated pipe insulated and elevated (freshwater line)
Discharge facilities & pipeline	Use insulated pipe with heat tracing; elevate pipeline across thaw sensitive terrain	- Insulated pipe insulated and elevated
Non-contact diversion facilities	Silt fences as required to manage sediment loss; rock aprons as required to slow the rate of thaw penetration and stabilize the underlying soils	- Silt fences not required as of yet
Vault access road culverts (Turn Lake)	Maintenance, as required, to restore smooth grade where thaw settlement is a problem; avoid culverts in areas susceptible to thaw settlement	- No maintenance as required

12.5.2 Predicted Residual Impacts

A summary of predicted residual impacts (after mitigation), as described in the FEIS and results of monitoring in 2018 to assess the accuracy of these predictions is provided in Table 12.12 below.

In general, degradation of permafrost was predicted in association with the construction of mine buildings, and development of permafrost was predicted in association with dikes, TSF, and WRSF construction. Predictions are typically related to closure-phase impacts, so results of monitoring to date are presented here to demonstrate progress, but validity of the prediction (i.e. whether or not the prediction is supported by the monitoring data) cannot be determined at this time.

Table 12.12 Predicted and measured impacts to permafrost.

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted (2018)	Predicted Impact in FEIS	Observed Impacts (2018)
Permafrost aggradation and stabilization of new active layer in dikes	Dike design	Monitor ground temperatures; monitor slopes; monitor sub-permafrost pore pressures (tailings dike)	Ground temperature monitoring (thermistors)	Net increase in permafrost distribution and/or decrease in ground temperatures.	East Dike, Bay-Goose Dike, South Camp Dike: similar to historical trends, partially frozen foundations. Vault Dike: frozen foundation Central Dike: similar to historical trends, partially frozen foundation SD1&2: frozen foundations; SD3,4,5: partially frozen foundations; Stormwater Dike: partially frozen foundation
Permafrost changes in Second Portage Lake (2PL) NW arm area	Dewatering, reclaim and attenuation pond filling, and tailings deposition	Representative monitoring of ground temperatures; assessment of anticipated ice entrapment (i.e. ground ice development)	Thermistor monitoring in TSF (thermistors NC-T1, NC-T2, NC-17-01 through 08)	Net increase in permafrost distribution and/or decrease in ground temperatures	Thermistors indicate tailings are not completely frozen.
Permafrost changes in Third Portage Lake	Portage pit development	Assessment of suspected ground ice development in	None	Net increase in permafrost distribution and/or decrease in ground	General increase in permafrost aggradation due to structures;

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted (2018)	Predicted Impact in FEIS	Observed Impacts (2018)
(TPL) north central shoreline and Portage Pit area		conjunction with permafrost aggradation. Assessment of ground ice content of select shoreline polygons.		temperatures	permafrost is developed in part of the Portage Pit and Goose Pit walls, under the Goose Dike.
Permafrost changes in waste rock area	Construction of waste rock facility	Internal and foundation temperatures to be monitored	Thermistor monitoring of internal and foundation temperatures	Fall, winter and spring placement will continue to bury the natural ground surface and permafrost will aggrade into the waste rock where a new and temporary active layer will form. Placement of lifts on natural ground in the summer may continue to cause temporary and localized deepening of the active layer, warming of near surface permafrost and possible subsidence, particularly in low lying areas.	Frozen ground conditions under the Portage RSF for all thermistor locations. Rockfill temperature below 0 °C for at least 10m above ground surface for all instruments.
Potential settlement of buildings	Loss of permafrost under heated structures	Ground temperature measurements where there is a need to monitor foundation temperatures	None	Net decrease in permafrost distribution and/or increase in ground temperatures	No ground temperature measurements have been undertaken at or near buildings on site. To date there has been no observed thawing of foundations.
Permafrost changes below	Stabilization of permafrost	Monitor pipeline alignment for potential	None	Minor and undifferentiated net gain or loss of	No ground temperature measurements but no

Potential Impact	**Potential Cause(s)**	**Proposed Monitoring**	**Monitoring Conducted (2018)**	**Predicted Impact in FEIS**	**Observed Impacts (2018)**
pipelines	temperature and active layer thickness	permafrost degradation		permafrost	observations of thawing due to pipelines.

12.5.3 Effectiveness of Monitoring

Aggradation of permafrost and stabilization of the active layer are being consistently monitored for the dikes, tailings storage facility, and waste rock storage facility. Changes in permafrost conditions as a result of these features are therefore effectively compared to FEIS predictions. However it should be noted that these processes are ongoing as site operations continue, and final determinations of the accuracy of many predictions cannot effectively be made until cessation of related site works.

12.5.4 Effectiveness of Mitigation and Recommendations for Additional Mitigation or Adaptive Management

Other than dike, TSF, and WRSF monitoring as described above, no specific monitoring is associated with most permafrost mitigation measures as presented in Table 12.12. No instrumentation has been installed to date to monitor building or pipeline effects on permafrost. Since the pipelines and infrastructure are observed to be stable, it is considered that the permafrost is lightly impacted by these features as predicted in the FEIS. Therefore, the mitigation measures in place to reduce impacts of the project on permafrost for these features are generally assumed to be working effectively.

Effectiveness of mitigation measures related to permafrost and dikes, the TSF, and WRSF will be determined at closure since FEIS predictions are related to closure-phase impacts.

Regular field inspections, monitoring and assessment of the monitoring data will continue in 2018. No management actions specifically related to permafrost monitoring are identified in the 2018 Geotechnical Inspection Report (Appendix 7).

Additional management and monitoring recommendations related to other geotechnical considerations can be found in the 2018 Geotechnical Inspection Report (Appendix 7).

12.5.5 Contributions to Regional Monitoring

A research project in collaboration with the Research Institute of Mines and Environment (RIME) was initiated in 2014 at Meadowbank. The Research Institute on Mines and Environment, through the NSERC-UQAT Chair on Mine Site Reclamation, is mandated to evaluate the performance of two field experimental cells constructed in 2014 and 2015 on Meadowbank's North Cell TSF. Monitoring for these cells continued in 2018, and design work began for a test cell to evaluate thermal cover for the Whale Tail Pit waste rock storage facility.

To date, a number of conference presentations have been made as a result of this work:

- Awoh, A.S., Bruno, B., Batzenschlager, C., Boulanger-Martel, V., Lépine, T. & Voyer, É. 2016. Design, construction and preliminary results of two insulation covers at the Meadowbank mine. Geo-Chicago 2016: Sustainability, Energy, and the Geoenvironment. American Society of Civil Engineers, Chicago, IL, 12.

- Boulanger-Martel, V., Bussière, B., Côté, J. & Gagnon, P. 2017. Design, construction, and preliminary performance of an insulation cover with capillary barrier effects at Meadowbank mine, Nunavut. 70th Canadian Geotechnical Conference, Ottawa, Ontario, Canada.

- Boulanger-Martel, V., Bussière, B. & Côte, J. 2018. Évaluation de modes de restauration pour le parc à résidus miniers de la mine Meadowbank. Rouyn-Noranda 2018 Symposium on mines and the environment. Canadian Institut of Mining, Metallurgy and Petroleum, Rouyn-Noranda, Québec, Canada.

- Boulanger-Martel, V., Poirier, A., Côté, J. & Bussière, B. 2018. Thermal conductivity of Meadowbank's mine waste rocks and tailings. 71th Canadian Geotechnical Conference, Edmonton, Alberta, Canada.

A set of journal articles are planned to be submitted for publication in 2019.

12.6 SOCIO ECONOMIC

A comprehensive assessment of socio-economic indicators, comparison to FEIS predictions, and review of management/mitigation measures is provided in the 2017 Socio-Economic Monitoring Report (Appendix 58). In addition, these data are summarized here.

12.6.1 Mitigation Measures

A summary of the planned mitigation measures for socio-economic impacts for the operations phase (per FEIS, Appendix B, Table B.15-2) along with implementation in 2018 is provided in Table 12.13.

Table 12.13. Mitigation measures described in the FEIS to reduce impacts of the project on socio-economic VECs, and commentary on current implementation.

VSEC	**Planned Mitigation Measure** (FEIS, Appendix B, Table B.15-2)	Implementation (unless indicated, reference to 2017 Socio-Economic Monitoring Report, Appendix 57)
Employment, training, and business opportunities	Preferential employment and contracting	**Yes -** Table 2
	Preferential hiring	**Yes -** Table 2
	Preferential procurement	**Yes** - Table 2 & Table 3
	Education and training initiatives	**Yes -** Table 2 & Table 3
	Education initiatives directed at specific concern around youth and their future in a mixed economy	**Yes -** Table 2
Traditional ways of life	Allowing use of project winter road to traditional land users	**Yes** – Section 9.2
	Income and workforce management practices that value and provide opportunity for traditional activity	**Yes** – Table 5
	Workforce management and community initiatives in support of traditional activity	**Yes** – Table 5
Individual and community	Assistance to individuals	**Yes** – Table 6

wellness	experiencing problems and their families, zero tolerance policies	
	Short rotations	**Yes –** Workforce Barriers Study (Appendix 61)
	Workforce management best practice, including codes of conduct, rotation to point of hire, etc.	**Yes –** Workforce Barriers Study (Appendix 61) and monitored through the IIBA
	Driver training, public education to reduce potential for traffic accidents	**Yes -** Driver training is part of Mandatory Training, public education to reduce potential for traffic accidents is done through annual AWAR public meetings
	Operations best practice to minimize emergencies, emergency response planning in the event of an emergency	**Yes** – Table 7
	Support for community wellness initiatives	**Yes** – Table 6
Infrastructure and social services	Employment at good wages	**Yes** – Table 2
	Avoidance of sites of heritage significance, protocol in place in event that new sites are identified	**Yes** – Socioeconomic and Archaeology Management Plan **Yes** – Always conduct archeology studies or consultation of previous archaeology studies before construction to confirm present or not of heritage sites. Mitigation measure to be implemented as per the consultant recommendation and Government of Nunavut.

12.6.2 Accuracy of Predicted Impacts

Based on results of the 2017 Socio-Economic Monitoring Report (July, 2018) the accuracy of Project impacts as predicted in the FEIS is assessed for each identified valued socio-economic component (VSEC) in Table 12.15. All VEC's are interpreted along with trending since construction phase.

Table 12.14. Key for Table 40.

Time horizon	Direction	Value
Pre-dev: trend prior to the operation / construction phase of the project (2010) **Post-dev**: trend from the onset of operation of Meadowbank (2010). **Last year**: movement from 2016 to 2017	↑ Increasing ↓ Decreasing → Remaining stable / No discernable trend **N/A** Not applicable	■ **Positive**: change in indicator towards the achievement of the desired impact or goal ■ **Negative**: change in indicator away from the achievement of the desired impact or goal ■ **Neutral**: no observed change in indicator with regard to the achievement of the desired impact or goal

Table 12.15. Summary of FEIS predictions for socio-economic VSECs, observed trends, and interpretation of monitoring results in comparison to FEIS predictions.

Sector and Overarching FEIS Prediction	Metric	Specific FEIS Prediction	Meadowbank Trends			Interpretation
			Pre-dev	Post-dev	Last year	
VSEC 1. EMPLOYMENT						
“The potential impacts of employment are likely to take some time to gain full momentum, and overall are considered of high magnitude, positive, long term and of high significance, specifically to those individuals and their families who are able to benefit.” (Cumberland Resources, 2006, pg. 120)	1.1 Total project employment (Agnico Eagle & contractors)					
	Project employment (permanent, temporary, on-call & contractor)	“It is expected that the construction phase workforce will average 160 and peak at 310, and the operation phase workforce is estimated at 370.”	N/A	→	↓	The total Meadowbank employee figures to date have significantly exceeded the values predicted in the FEIS for employment at the mine, largely due to an expansion of the project scale from the initial Cumberland project proposal.
	1.2 Project Inuit employment (Agnico Eagle)					
	Project Agnico Eagle employment (Inuit & non-Inuit)					Meadowbank Agnico Eagle Inuit FTEs have been holding relatively steady for the past 3 years (221, 221 and 218), representing between 28% and 29% of the total Agnico Eagle workforce. Contractor Inuit employment over the same time timeframe increased from 25 to 48 – though this may be a result of better tracking in 2017 where FTES are used compared with employment numbers in prior years.
	Inuit FTEs		N/A	→	→	
	Inuit FTE rate		N/A	→	→	
	Project contractor employment (Inuit & non-Inuit)					
	Employees / FTEs		N/A	→	↑	
	Inuit employee / FTE rate		N/A	↓	↑	
	1.3 Project Agnico Eagle employment by Kivalliq community					
	Project employment by Kivalliq community		N/A	↑	↑	In 2017, over half (53%) of Meadowbank’s Kivalliq-based employees were from Baker Lake. Additionally, Arviat supplies a large and increasing proportion of Agnico Eagle’s Inuit workforce, reaching a high of 70 employees in 2017. Employees from the

Sector and Overarching FEIS Prediction	Metric	Specific FEIS Prediction	Meadowbank Trends			Interpretation
			Pre-dev	Post-dev	Last year	
						remaining Kivalliq communities (Chesterfield Inlet, Coral Harbour, Whale Cove and Naujaat) rose in each community, increasing cumulatively from 26 employees to 44 between 2016 and 2017.
	1.4 Project employment by gender					
	Project employment (gender)					Agnico Eagle female employment at Meadowbank has been steadily increasing since 2013, from a low of 10% up to 20%. It is at its highest level since the mine began production and has now surpassed the Canadian mining sector average of 17%.
	employees		N/A	↑	↑	
	rate		N/A	↑	↑	
	1.5 Project turnover					
	Project turnover (Inuit & non-Inuit)		N/A	↓	↓	The turnover rate for Meadowbank permanent Inuit employees remained stable in 2017 at 28%, while temporary employee turnover rate is showing signs of stabilizing near 50% following a drop from 2010 to 2014.
	Agnico Eagle Inuit employee turnover by reason		N/A	↓	↓	
	Percent turnover by community		N/A	↑	↑	2017 saw a large increase in turnover in Meadowbank employees from Coral Harbor and Naujaat, with nearly as many employees leaving as were working there when the annual snapshot was taken (just over for Coral Harbor at 109% and just under at Naujaat at 92%).
VSEC 2. INCOME						
“The potential impacts of increased income are considered of high magnitude, positive, long-term and of high significance, particularly to those individuals and their families who are able to benefit. It is expected that overall community effects, moderate in significance, are likely to be most experienced in Baker Lake, as most direct employment will occur here.” (Cumberland Resources Ltd., 2006, p. 121)	2.1 Income paid to projects’ Inuit employees					
	Income paid to Agnico Eagle project Inuit employees	“Direct project wages paid to people in Kivalliq Region, primarily Baker Lake, could exceed $4 M annually”	N/A	↑	→	Income paid to Inuit employees for the Meadowbank project in 2017 was $18.1M, significantly exceeding FEIS predictions
	2.2 Income by Kivalliq community					
	Median employment income of tax filers by Kivalliq community		↑	↑	N/A	The most recent data available for this indicator is from 2015. Median employment income has increased gradually overall in the Kivalliq region since 2006, with no significant inflection (i.e. change in growth rate) since 2010. Among the Kivalliq communities with highest levels of Meadowbank employment (Baker Lake, Rankin Inlet, and Arviat), only Rankin Inlet shows a significant increase in the income growth rate when comparing the 2006-2010 period to the 2010-2015 period.

Sector and Overarching FEIS Prediction	Metric	Specific FEIS Prediction	Meadowbank Trends			Interpretation
			Pre-dev	Post-dev	Last year	
VSEC 3. CONTRACT EXPENDITURES						
The potential impacts of employment are likely to take some time to gain full momentum, and overall are considered of high magnitude, positive, long term and of high significance, specifically to those individuals and their families who are able to benefit.” (Cumberland Resources Ltd., 2006, p. 121)	3.1 Contract expenditures					
	Contract expenditures on NTI-registered businesses					In 2017, $213M and 55% of expeditures for the Meadowbank project were to NTI-registered businesses.
	NTI expenditures		N/A	↑	↑	
	Proportion NTI		N/A	↑	→	
	2017 NTI-registered business expenditures by Nunavut community		N/A	N/A	N/A	In 2017, $94M was spent on Rankin Inlet businesses, $70M on Baker Lake businesses, $46M on Iqaluit-based businesses, and a small proportion on Arviat-based businesses.
	Contract expenditure on Nunavut-based businesses					In 2017, $271M and 70% of expeditures for the Meadowbank project were to Nunavut-based businesses.
	Nunavut-based expenditures		N/A	↑	↑	
	Proportion Nunavut-based		N/A	/	↑	
	Contract expenditures from Meadowbank on Baker Lake-based businesses	“With continuing preferential contracting, local business participation in the project is expected to grow with time.” (Cumberland Resources Ltd., 2006, p. 7)	N/A	↓	↑	Meadowbank expenditures on Baker Lake-based businesses continued a 2-year upward trend in 2017, corresponding with construction activities. The proportion of contract expenditures has risen by $43M over the past two years in Baker Lake, although this is still less than when Meadowbank began operation. This suggests that spending has diversified to other communities across the territory.
VSEC 4. EDUCATION AND TRAINING						
“The potential impacts of education and training are considered of medium magnitude, positive, long term and of high significance, specifically to those individuals and their families who are able to benefit.” (Cumberland Resources Ltd., 2006, p. 121)	4.1 Investment in school-based initiatives					
	Agnico Eagle investments in school-based initiatives	“Cumberland and KIA will address the need for a broader based project education and training initiatives [sic] to assist those who wish to develop skills that will position them for project employment. This education and training initiatives [sic] will also include an element to address motivational issues around getting children through high school. Such measures	N/A	↓	↑	Up until 2014, Agnico Eagle contributed approximately $284K/year to a variety of school-based initiatives. With the expiry of the MOU with the Department of Education in 2015, these contributions dropped to $39K. They remained unchanged in 2016 and rose to $55K in 2017 due to a doubling of scholarship funding.

Sector and Overarching FEIS Prediction	Metric	Specific FEIS Prediction	Meadowbank Trends Pre-dev	Meadowbank Trends Post-dev	Meadowbank Trends Last year	Interpretation
		would be intended to contribute to encouraging a commitment to education on the part of youth." (Cumberland Resources Ltd., 2006, p. 121)				
	4.2 Secondary school graduation by region					
	Secondary school graduation rate by region		↑	↑	N/A	The graduation rate in Kivalliq region fluctuates from year to year, though shows an overall upward trend that began in 2008. Rates have been at all-time highs for the region, and consistently higher than those in the other two regions, since 2010.
	4.3 Project training and education					
	Agnico Eagle investments in mine training and education programs	"Cumberland and KIA will address the need for broader based project education and training initiatives to assist those who wish to develop skills that will position them for project employment." (Cumberland Resources Ltd., 2006, p. 121)	N/A	→	↓	From 2014 to 2016, there was a consistent level of investment by Agnico Eagle (~$2.3M/year) in external mine training programs (e.g. Kivalliq Mine Training Society). In 2017, this dropped to $195K as the KMTS lost their federal funding; the future of the organization is currently uncertain.
	Average mandatory training hours provided to Agnico Eagle Inuit employees		N/A	↑	→	In 2017, mandatory training hours remain fairly stable at Meadowbank, indicative of steady rates of turnover.
	Average specific training hours provided to Agnico Eagle Inuit employees		N/A	↑	↓	Specific training hours declined at Meadowbank from 84 hours / Inuit FTE in 2015, down to 51 hours in 2017. Annual fluctuations in the number of training hours largely reflect changing demand for additional positions and so are not considered negative or positive.
	Participation in career and skills programs		N/A	/	↓	Participants in TASK week and graduates from the Arviat Diamond Drillers and Welders Program had remained steady until last year, decreasing by 12 and 11 respectively. Meadowbank's Haul Truck Driver Program also saw a decline in 2017 from 34 to 26 participants. These fluctuations could be explained by the success of each program as well as changing demand for specific skills at Meadowbank.
	Meadowbank pre-apprenticeship and apprenticeship participation by		N/A	↑	↑	The number of Inuit apprenticeships increased by 3 in 2017. In addition to the number of Inuit participants, the apprenticeship program has seen growth over the

Sector and Overarching FEIS Prediction	Metric	Specific FEIS Prediction	Meadowbank Trends			Interpretation
			Pre-dev	Post-dev	Last year	
	type					past 4 years in diversity, moving from two offered programs in 2013 to seven in 2017.
	4.4 Project employment by skill level					
	Project Agnico Eagle Inuit employees by skill-level		N/A	↑	↑	2017 has seen an increase in Inuit employees at higher skill levels, with the total number of skilled, management and professional employees rising from 6 in 2016 to 15 in 2017.
VSEC 5. CULTURE AND TRADITIONAL LIFESTYLE						
"There is potential for both negative and positive impacts, of any magnitude, on traditional ways of life, which could be of high significance. Any net impact, since it would be an impact of cultural change, would be long term and continue beyond the life of the project. The impact would be experienced primarily in Baker Lake." (Cumberland Resources Ltd., 2006, p. 123)	5.1 Perceptions of culture and traditional lifestyle					
	Self-reported effect of project on culture and traditional activities		N/A	N/A	N/A	Data currently unavailable.
	5.2 Culture and traditional lifestyle					
	Proportion of total population identifying Inuktitut as their mother tongue by community		→	↓	N/A	The proportion of the population identifying Inuktitut as their mother tongue has remained relatively stable in the smaller Kivalliq communities from 2006 to 2016, but has declined in Rankin Inlet, Baker Lake, and Chesterfield Inlet (by 10 to 18 percentage points) over this period.
	Use of AWAR by community	"The project will not significantly restrict access to or productivity of lands used for traditional activity." (Cumberland Resources Ltd., 2006, p. 122)	N/A	↑	↓	The Agnico Eagle-owned and operated all-weather access road (AWAR) that connects Baker Lake to the Meadowbank mine is accessible to the communities for hunting purposes. Community members accessed the road 2366 times in 2015, 1874 times in 2016, and 1716 times in 2017.
	5.3 Country food use at project					
	Country food kitchen usage		N/A	→	→	Meadowbank has maintained its practice of offering meals including char, muskox, and caribou (approximately 4,500 meals/year, or one per month per employee, since 2011).
	Country food night events		N/A	→	↓	The number of country food events held at Meadowbank decreased from 14 in 2016 to 4 in 2017 – largely due to a lack of country food availability. Turnout for these events has averaged 36 attendees per event in 2016 and 43 in 2017.
VSEC 6. POPULATION DEMOGRAPHICS						
"The potential impacts of	6.1 Employee migration					

Sector and Overarching FEIS Prediction	Metric	Specific FEIS Prediction	Meadowbank Trends			Interpretation
			Pre-dev	Post-dev	Last year	
migration are complex and are likely to have both positive and negative components, but of low magnitude. Any effects of migration are long term but are likely to be low significance. It is not likely that migration to any other community than Baker Lake would be significant." (Cumberland Resources Ltd., 2006, p. 126)	Project Agnico Eagle Inuit employees residing outside Nunavut	The Meadowbank FEIS suggests that in-migration of Southerners to Baker Lake would be the primary concern.				There has been a gradual increase in the number of Inuit Meadowbank workers who now reside in outside of Nunavut, from 7 in 2011 to 21 in 2015 (or 7% of the Inuit workforce), though this number has remained stable in 2016 and 2017. The FEIS predicts both "positive and negative components" of migration but does not refer to migration out of Nunavut.
	Total Inuit employees		N/A	↑	→	
	Proportion of Inuit to Non-Inuit employees		N/A	↑	→	
	6.2 Population estimates in Kivalliq communities					
	Population estimates of Kivalliq communities	The Meadowbank FEIS states that "it is not likely that migration to any other community than Baker Lake would be significant", but does not provide any specific predictions on changes to populations in Kivalliq communities.				Yearly population estimates do not indicate an increase in the population growth rate of Baker Lake or of other communities with significant Meadowbank employment (Arviat, Rankin Inlet) since the mine opened, or relative to other communities in the region. If other factors (births and deaths) are assumed constant, the population data does not suggest significant migration to Baker Lake (or other communities with high Meadowbank employment).
	Estimates in communities		↑	↑	↑	
	Annual percent change		→	→	→	
VSEC 7. INDIVIDUAL AND COMMUNITY WELLNESS						
Potential impacts on individual and community wellness are complex, far reaching, and given human nature, difficult to predict with certainty. Individual and community wellness is intimately associated with potential impacts on traditional ways of life as discussed above. In addition, however, individual decisions on the use of increased income, household management in relation to rotational employment, migration, public health and safety, disturbance particularly during the construction phase, and Cumberland's support for community initiatives are being negotiated in the IIBA are [sic] the other drivers that have the potential to effect [sic] individual and community wellness." (Cumberland Resources Ltd., 2006, p. 123)	7.1 Agnico Eagle Programs					
	Agnico Eagle wellness programs offerings & utilization by project employees		N/A	/	/	Meadowbank has a number of ongoing programs that offer readiness, counselling and support services to employees and their families. Due to difficulties in assessing participation in counselling programs (in part due to privacy issues), no trends can be drawn on employee targeted program utilization. Program utilization offered to communities has increased over the past two years – largely due to the new Mandatory Training (Site Readiness) and Work Readiness programs.
	Agnico Eagle wellness programs offerings & utilization by community members		N/A	↑	↑	
	7.2 Perceptions of health & wellness					
	Self-reported effect of project on health & wellness		N/A	N/A	N/A	Data for this metric is currently unavailable.
	7.3 Criminal violations					
	Criminal violations per hundred people by Kivalliq community		↑	→	N/A	Total criminal violation rates in Baker Lake and Rankin Inlet reached historic high levels in 2011 and 2012, following the opening of Meadowbank. Recent data (2017) indicates a continuing downward trend (since 2012) in criminal violations in Baker Lake, along with those in Arviat. However, Rankin Inlet and Chesterfield Inlet have seen sharp rises in criminal violations over the past one to two years.
	Criminal violations per hundred people by type (Baker Lake, Rankin Inlet, Chesterfield Inlet)					
	Baker Lake		→	↓	↓	

Sector and Overarching FEIS Prediction	**Metric**	**Specific FEIS Prediction**	**Meadowbank Trends**			**Interpretation**
			Pre-dev	**Post-dev**	**Last year**	
	Rankin Inlet		→	↓	↑	
	Chesterfield Inlet		↑	→	↑	
	7.4 Health centre visits					
	Health centre/clinic visits by Kivalliq community by reason for visit	"The potential public health and safety impacts of the project, of unknown magnitude, are negative, and, because there is such high impact at the individual level in the event that a risk is realized, the effects must be considered long term and of high significance." (Cumberland Resources Ltd., 2006, p. 126)	N/A	N/A	N/A	Data for this metric is currently unavailable.
	7.5 Housing					
	Persons on waitlist for public housing by community		/	/	/	The number of persons on a waitlist for housing has been increasing in Baker Lake and Arviat steadily since 2010. Rankin Inlet has seen a substantial decrease in wait lists over this same period. This may be the result of additional construction of private dwellings as an economic center for the region.
	7.6 Food security					
	Food security by region or community		N/A	N/A	N/A	Data for this metric is currently unavailable.
	7.7 Suicide					
	Suicides per 10,000 people by region		/	/	/	There is a persistent and territory-wide suicide crisis in Nunavut. The factors contributing to suicide are numerous and complex, so it is difficult to assess impacts of Meadowbank on suicide rates. Community suicide rates (e.g. for Baker Lake) are highly variable from year to year. Trends are more apparent in long-term and/or regional data.
VSEC 8. HEALTH AND SAFETY						
The FEIS considers both the	8.1 Health and safety training					

Sector and Overarching FEIS Prediction	Metric	Specific FEIS Prediction	Meadowbank Trends			Interpretation
			Pre-dev	Post-dev	Last year	
health and safety of workers and the public and recognizes that one may affect the other. "Health and safety of workers and the population at large is subject to legislation and perhaps more importantly to best practices. Health and safety training also has applications in personal life – workers often not only use new health and safety training on-the-job, but also at home in the course of daily tasks." (Cumberland Resources Ltd., 2006, p. 126)	Average (per FTE) mandatory training hours provided to Agnico Eagle Inuit employees		N/A	/	→	A steady increase in overall mandatory training hours for full-time employees has occurred at both Meadowbank from 2015 to 2017. None of the data collected permits an assessment of the impacts of Agnico Eagle's projects and their programs on the general health status of workers and their families.
	8.2 Health and safety on-site					
	Average (per-FTE) visits by project Agnico Eagle employees to clinic for work-related or other reasons		N/A	↓	→	For the Meadowbank site there was a slight decrease in visits to Agnico Eagle clinics for work-related injuries in 2017. Overall, the number of clinic visits has been fairly stable since 2012.
	Project combined lost-time and light duty accident frequency (per 200,000 person-hours)		N/A	↓	↑	Lost-time and light duty accident frequency decreased for four years in a row up to 2015 but increased in 2016 (from .57 to .72) and in 2017 to 1.62.
VSEC 9. COMMUNITY INFRASTRUCTURE AND SERVICES						
The impacts on social services and infrastructure, of low to medium magnitude, are considered largely positive in the medium term and of moderate significance. There is some potential for closure to have a negative impact on social service delivery." (Cumberland Resources Ltd., 2006, p. 128)	9.1 Use of GN health services					
	Kivalliq community health centre visits per capita	"Increased employment and business opportunities will result in increased income, a measure of economic security, capacity building that will contribute to employability over the long term, and improved self-image of employees and their families. This could result in reducing dependence on government social services." (Cumberland Resources Ltd., 2006, p. 128)	↓	↑	N/A	Per capita health centre visits in communities with the most Agnico Eagle employees (Baker Lake, Rankin Inlet, and Arviat) are beginning to show an upward trend, most notably in Baker Lake and Arviat. The number of employees referred to their community health care centres for personal or work-related reasons ranges from 14 to 58 people per year, though it is difficult to draw a relationship between changes in this indicator and use of GN Health Services.
	Persons transported from site to access health services (province & Nunavut)		N/A	↑	↓	
	Incidents requiring use of GN health services		N/A	/	↓	
	9.2 Use of public infrastructure					
	Estimates of use of public physical infrastructure directly related to Project (airports, port, meeting facilities, roads)	"The impacts on social services and infrastructure, of low to medium magnitude, are considered largely positive in the medium	N/A	N/A	N/A	The use of public physical infrastructure by Meadowbank and its employees consists primarily of the use of airports and has been relatively consistent since operation began in 2010. There are no indications of significant positive or negative impacts on this infrastructure.

Sector and Overarching FEIS Prediction	Metric	Specific FEIS Prediction	Meadowbank Trends			Interpretation
			Pre-dev	Post-dev	Last year	
	All-weather access road (AWAR)	term and of moderate significance. There is some potential for closure to have a negative impact on social service delivery." (Cumberland Resources Ltd., 2006, p. 128)	N/A	/	↓	
	9.3 Social assistance					
	Per capita social assistance expenditures by community	"The impacts on social services and infrastructure, of low to medium magnitude, are considered largely positive in the medium term and of moderate significance. There is some potential for closure to have a negative impact on social service delivery." (Cumberland Resources Ltd., 2006, p. 128)	↓	/	N/A	Despite declines from historical highs, social assistance data does not show a clear correlation between mine-related employment and social assistance requirements in Baker Lake or Arviat. Data suggests that both expenditures and percentage of households receiving social assistance have been declining in Rankin Inlet since Meadowbank opened.
	Percentage of households receiving social assistance by community		↓	↓	↓	
VSEC 10. NUNAVUT ECONOMY						
"The economic impacts on the economy of Nunavut, of high magnitude, are positive over the medium term and of high significance, particularly during the construction phase." (Cumberland Resources Ltd., 2006, p. 129)	10.1 Royalties and taxes					
	Project compensation, royalties and taxes paid		N/A	↑	↑	Cumulative project royalties, taxes and other payments paid by Agnico Eagle to the GN, GoC, NTI and KIA increased at both Meadowbank and Meliadine in 2017. At Meadowbank this is largely due to IIBA payments to the KIA following 2017 agreements.
	10.2 Trade balance					
	Nunavut trade balance		↓	↑	N/A	Nunavut's net exports have increased steadily since 2008, following a dramatic increase in the trade deficit from 2006 to 2008 that was linked to the construction activities at Meadowbank. Since Meadowbank began operations in 2010, Nunavut's net exports have increased by approximately $131M.
	10.3 Nunavut GDP					
	Nunavut GDP by all industries and mining, quarrying and oil & gas	"The results indicate that during the construction phase, the project would contribute $120.3 M to	↑	↑	↑	Coinciding with Meadowbank becoming operational, Nunavut's GDP has grown at an average of 6% annually from 2009 to 2017. A sharp increase of 12% occurred in 2017.

Sector and Overarching FEIS Prediction	Metric	Specific FEIS Prediction	Meadowbank Trends			Interpretation
			Pre-dev	Post-dev	Last year	
	Nunavut GDP by all industries and mining, quarrying and oil & gas	the GDP of Nunavut … During the operations phase, the annual contribution to GDP would be $35.5M…" (Cumberland Resources, 2006, p. 119)	↓	↑	↑	According to the Conference Board of Canada, Meadowbank has been a driver of Nunavut's GDP growth, both during the construction of the mine and since production began in 2010. The 12% increase observed over the past year may in part be attributed to construction activities at Meliadine and Whale Tail, most notably a large increase in contract expenditures for the two construction projects.

12.6.3 Effectiveness of Monitoring

Since most FEIS predictions for valued socio-economic components are not quantitative or specific, it is difficult to make conclusions regarding the effectiveness of the monitoring programs at assessing these predictions. However, through the implementation of the Socio-economic Monitoring Program, and Baker Lake Wellness Plan, Agnico Eagle believes they are able to effectively assess the overall impacts of the project on the VSECs.

Over the past few years, Agnico Eagle has been working with the SEMC to improve data (in both government and Agnico Eagle data sets) and to refine indicator selection and analysis to more clearly identify potential links between socio-economic impacts and Agnico Eagle activities and/or other factors.

12.6.4 Effectiveness of Mitigation and Recommendations for Additional Mitigation or Adaptive Management

No specific additional mitigation or adaptive management actions are recommended. Agnico Eagle will continue to implement, support and improve the existing management and mitigation activities described in the SEMR.

12.6.5 Contributions to Regional Monitoring

In September 2017, Agnico Eagle participated in a meeting with GN and other mining companies operating in Nunavut to discuss the evolution of socio-economic reporting in the territory and to identify core indicators that could be reported by all projects. With the construction of Agnico Eagle’s Meliadine mine and the approval of its Whale Tail project, Agnico Eagle moved to an integrated socio-economic monitoring report for all sites for the 2017 reporting year and thereafter, while meeting the requirements for presenting site-specific data. This approach is supported by the GN and CIRNAC, and was reflected in revised Socio-Economic Monitoring Working Group Terms of Reference.

SECTION 13. REFERENCES

Agnico Eagle Meadowbank Division, 2013. Meadowbank Gold Project - 2013 Annual Report.

Agnico Eagle Meadowbank Division, 2014. Meadowbank Gold Project - 2014 Annual Report.

Agnico Eagle Meadowbank Division, 2015. Meadowbank Gold Project - 2015 Annual Report.

Agnico Eagle Meadowbank Division, 2016. Meadowbank Gold Project - 2016 Annual Report.

Agnico Eagle Meadowbank Division, 2017. Meadowbank Gold Project - 2017 Annual Report.

CCME. Water Quality Guidelines for the Protection of Aquatic Life. Canadian Environmental Quality Guidelines Summary Table. <http://st-ts.ccme.ca/?chems=all&chapters=1>. Accessed on February 2016.

Cumberland Resources LTD. October 2005. Meadowbank Gold Project. Physical Environment Impact Assessment Report

Golder. 2007. 06-1122-336-2500 - Water Quality Predictions Meadowbank Gold Project Nunavut.

Golder. 2018. 2018 Annual Geotechnical Inspection, Meadowbank Gold Mine, Nunavut.

SNC-Lavalin. April 2019. Meadowbank Water Quality Forecasting – Update for the 2018 Water Management Plan.