MEADOWBANK COMPLEX

2020 Annual Report

61-000-100-REP-003

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 Complex

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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	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 / KivIA	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
SWTC	South Whale Tail Channel
TAG	Terrestrial Advisory Group
TAP	Technical Advisory Panel
TARP:	Trigger Action Response Plan
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
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
WTN	Whale Tail North
WTP	Water Treatment Plan
WTS	Whale Tail South
W/D	Wet/Dry

DOCUMENT CONTROL

Version	Date (YMD)	Section	Page	Comment
1	2020/04/16	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:

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Environmental Superintendent Interim

SECTION 1. INTRODUCTION

From the early days of the outbreak of the COVID-19 pandemic, Agnico Eagle implemented extraordinary measures with a constant focus on protecting the health and safety of its employees, on protecting and supporting the communities in which it operates and on protecting its operations. Throughout 2020, the Company continually enhanced its safety protocols, maximized teleworking where possible and increased its testing capacity. In its effort to support the local communities in which it operates, Agnico Eagle maintains constant communication with local authorities to understand the community-based priorities and to identify where we are able to help. At the end of 2020, the Nunavut-based workforce remained at home due to current COVID-19 health guidelines issued by the Government of Nunavut. As the distribution of COVID-19 vaccines has begun in local Nunavut communities, Agnico Eagle is preparing to reintegrate the Nunavut based workforce to its operations in the course of 2021.

The 100% owned Meadowbank Complex is located approximately 110 kilometres by road north of Baker Lake in the Kivalliq District of Nunavut, Canada. The complex consists of the Meadowbank mine and mill, and the Amaruq satellite deposit, which is located 50 kilometres northwest of the Meadowbank mine.

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 ore processing at the Meadowbank mine site from Agnico Eagle's new mining undertaking at the Whale Tail Pit site. On March 2019, the Water License was amended for the third time to allow for tailings disposal in the mined-out Goose and Portage pits. On May 2020, the fourth amendment was granted to allow the activities for the Whale Tail Expansion Project, i.e. the term of the Water License was extended by 4 years, now expiring in March 2030. The Project is governed by current Water Licence No: 2AM-MEA1530 (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. No mining at Meadowbank occurred in 2020 since the mineral reserves were exhausted in 2019. Amaruq ore continued to be processed at Meadowbank mill in 2020. As approved by the Water License, in-pit tailings disposal began in Goose Pit on July 5th, 2019 and in Portage Pit E on August 20th, 2020.

In 2016, Agnico Eagle proposed to develop the Whale Tail Pit Project 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 mining operation uses the existing infrastructure at the Meadowbank mine (mining equipment, mill, tailings, camp and airstrip). Additional infrastructure has been built at the Amaruq site (truck shop/warehouse, fuel storage and an additional camp facility). The deposit was mined as an open pit in 2019 and the commercial production was achieved on September 30th, 2019. Amaruq ore is transported using long haul off-road type trucks to the mill at the Meadowbank site for processing.

In 2018, Agnico Eagle proposed to increase gold production from the original Whale Tail Pit Project by expanding mining activities at the Whale Tail Pit site as proposed in the Expansion Proposal. The Expansion Proposal proposes further developing the Whale Tail Pit open mine in addition to the development of the IVR open pit and Underground pit. The Amaruq Phase 2 expansion started in October 2018 with the application to NPC. The permitting process to amend the Whale Tail Project Certificate and Type A Water Licence to include the Amaruq Phase 2 expansion was completed in early 2020. As part of this process, the NIRB held public hearings on the proposed expansion from August 26th to 29th, 2019 in Baker Lake. In a decision issued on October 18th, the NIRB concluded that if conducted in accordance with the NIRB's recommendations, this proposed amendment to the Whale Tail project could proceed to the Type A Water License amendment phase with the NWB. The Minister of Northern Affairs approved the amended Project Certificate Report from the NIRB (October 18th decision) on January 20th, 2020, completing the NIRB process. The Project Certificate 008 amendment No. 1 was received on February 19th, 2020. The NWB Water License amendment process was completed on May 12th, 2020 and the Water License Amendment No. 2AM-WTP1830 was issued.

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), Environment and Climate Changes Canada (ECCC) Metal and Diamond Mining Effluent Regulations (MDMER); Fisheries and Oceans Canada (DFO), Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC); the Kivalliq Inuit Association (KivIA) and the Nunavut Impact Review Board (NIRB).

This report is written to address all of the 2020 annual reporting requirements of the project under these authorizations:

Meadowbank

- NWB Type A Water License 2AM-MEA1530;
- 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);
- KivIA Production Lease KVPL08D280; and
- KivIA Right of Way KVRW06F04.

Whale Tail

- NWB Type A Water License 2AM-WTP1830;
- NIRB Project Certificate N0. 008;
- DFO HADD Authorization 16HCAA-00370;
- DFO HADD Authorization 20HCAA-00275;
- CIRNAC Land Leases 66H/8-02-1 (Whale Tail Haul Road) and 66H/8-01-4 (Whale Tail Haul Road Quarries);
- KivIA Production Lease KVPL17D01;
- KivIA Quarry Lease KVCA15Q01, KVCA15Q02, KVCA18Q01; and
- KivIA Right of Way KVRW15F01.

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 outlines each requirement by authorization and report section. Table 1-2 presents the status of each sampling stations stipulated in Part I, Schedule I of Water License 2AM-MEA15230 and 2AM-WTP1830. Appendix 1 provide a list of commitment done by Agnico, following review by regulators of the 2019 Annual Report, to be incorporated in the 2020 Annual Report.

Table 1-1 Meadowbank and Whale Tail List of Reporting Requirements

MEADOWBANK GOLD PROJECT		
Authorization Reference	**Reporting Requirement**	**Report Section**
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 non compliance as required by law immediately and report the same to NIRB annually.	11.6.1
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	8.7.1
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	5.1.1
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	5.3.1
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.	5.4.1
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 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.	5.3.2
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.	8.21.1
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	8.5.7
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.	11.4
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
NIRB Project	Prior to opening of the road, and annually thereafter, advertise and hold at least one	11.7.2.1

Certificate No.004 Condition 32e	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.	
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.	11.7.2.1
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.	11.7.1.1
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.	11.7.2.1
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 aright-of-way policy developed in consultation with the KivIA, GN, INAC and theHamlet of Baker Lake, for the safe operation of the all-weather private accessroad; and2. to facilitate monitoring of the environmental and socio-economic impacts of theprivate road and undertake adaptive management practices as required,including responding to any concerns regarding the locked gates.	11.7.1.1
NIRB Project Certificate No.004 Condition 36	Shall ensure the placement of local area marine mammal monitors onboard all vessels transporting fuel or materials for the Project through Chesterfield Inlet.	11.8.2
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.	11.9.1
NIRB Project Certificate No.004 Condition 40	Report to KIA and NIRB's Monitoring Officer annually on the Traditional Knowledge gathered including any operational changes that resulted from concerns shared at the workshop.	11.9.1/11.9.2
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.	11.8.1
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	11.8.5
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.	8.11.1
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	8.16
NIRB Project Certificate No.004, Condition 52	Cumberland shall enforce a no-fishing policy for employees while working on the job site.	8.17
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	8.8.1
NIRB Project Certificate No.004 Condition 54	a. Updated terrestrial ecosystem baseline data; 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	8.18.1.2

	preconstruction baseline harvesting data, to be developed in consultation with local HTOs, the GN-DOE and the Nunavut Wildlife Management Board; 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. 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. h. Details of a monitoring program, including recording the locations and frequency of observing caribou and carnivores and any actions taken to avoid contact with or disturbance, and a specific mitigation plan for Shortearred owls and any other species of special concern pursuant to Schedule 3 of the Species at Risk Act located in the local study area or along the all-weather private access road,	
NIRB Project Certificate No.004 Condition 55	Annual Wildlife Summary Monitoring Report	8.18.1.1
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.	8.18.1.3
NIRB Project Certificate No.004 Condition 57	Participate in a caribou collaring program as directed by the GN-DOE.	8.18.1.4
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	11.9.2
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	11.9.2
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.	8.18.1.9
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	8.13.1
NIRB Project Certificate No.004 Condition 63	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	11.10.1
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	11.10.1
NIRB Project	Cumberland shall include in its socio-economic monitoring program for the Meadowbank	11.10.3

Certificate No.004 Condition 65	Project the collection and reporting of data of community of origin of hired Nunavummiut	
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	8.19
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
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"	8.20.1
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.	8.20.1
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.	8.14.1
NIRB Project Certificate No.004 Condition 72	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.	6.2.1
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.	8.15.1
NIRB Project Certificate No.004 Condition 74	Shall employ environmentally protective method to suppress any surface road dust.	8.14.1
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	7.3
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.	9.2.1.1
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.	11.8.4
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	8.6.1
NIRB Project Certificate No.004 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.	5.3.2
NIRB Project Certificate No.004,	Observe, collect and maintain information on road-use to facilitate monitoring of the nonproject uses of the road	11.10.3

Commitment 18		
NIRB Project Certificate No.004, Commitment 21	Track the community of origin of hired Nunavimmiut to direct monitoring and followup activities	11.10.3
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.	6.1.1
NIRB Project Certificate No.004, Commitment 95	Inuit observation and encounter reports for on-board vessels transporting goods and fuel through Chesterfield Inlet.	11.8.2
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	11.10.3
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	11.10.3
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NWB 2AM-MEA1530 Schedule B-13	A list and description of all unauthorized discharges including volumes, spill report line identification number and summaries of follow-up action taken.	7.1.1
NWB 2AM-MEA1530 Schedule	A summary of modifications and/or major maintenance work carried out on all water and waste related structures and facilities.	11.1.1

B-14		
NWB 2AM-MEA1530 Schedule B-15	The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I.	8.5
NWB 2AM-MEA1530 Schedule B-16	The results of monitoring under the 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 and Groundwater Monitoring.	SECTION 8
NWB 2AM-MEA1530 Schedule B-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.	9.1.1.1
NWB 2AM-MEA1530 Schedule B-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.	5.4.1
NWB 2AM-MEA1530 Schedule B-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.	9.2.1.1
NWB 2AM-MEA1530 Schedule B-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.	10.1.1
NWB 2AM-MEA1530 Schedule B-21	Where applicable, revisions as Addendums, with an indication of where changes have been made, for Plans, Reports, and Manuals.	10.2.1
NWB 2AM-MEA1530 Schedule B-22	An executive summary in English, Inuktitut and French of all plans, reports, or studies conducted under this Licence.	10.4.1
NWB 2AM-MEA1530 Schedule B-23	A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector.	11.5.1
NWB 2AM-MEA1530 Schedule B-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.	11.9
NWB 2AM-MEA1530 Schedule B-25	Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported.	4.6.1/6.3.1
NWB 2AM-MEA1530 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.	10.2.1
NWB 2AM-MEA1530 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.	4.4.2.1
NWB 2AM-MEA1530 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	4.4.3.1
NWB 2AM-MEA1530 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.	4.4.1.1
NWB 2AM-MEA1530 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.	3.3.1
NWB 2AM-	The Licensee shall submit to the Board as part of the Annual Report required under Part B	3.2.1

MEA1530 Part I Item 12	Item 2, all reports and performance evaluations prepared by the Independent Geotechnical Expert Review Panel.	
NWB 2AM-MEA1530 Part I Item 14	The Licensee shall submit the results and interpretation of the Seepage Monitoring program required in Part I, Item 13 in the Annual Report required under Part B, Item 2.	8.5.8.1
NWB 2AM-MEA1530 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.	8.5.7
DFO Authorizations NU-03-0191.3 Condition 3.1, NU-03-0191.4 Condition 3.1; NU-03-0190 Condition 5, NU-14-1046 Condition 3	Submit written report summarizing monitoring results and photographic record of works and undertakings.	8.5
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.	8.5.1.1
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.	8.5.1.1
DFO Authorizations NU-03-0190 Condition 5.3	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 […]	8.5.6.1
DFO NU-03-0190 AWPAR Condition 5.2.4	Creel survey results.	8.16
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.	8.8.1
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, a report describing any variations from the Abandonment and Restoration Plan and updated cost estimates.	9.2.1.2
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.	9.1.1.2
CIRNAC Land Lease 66A/8-72-5 Condition 8	The lessee shall file a report, annually ... i. Quantity of material removed and location of removal, for the immediately preceding calendar year ii. Such other data as are reasonably required by the Minister from time to time.	3.4.1.1
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.	3.4.1.1
CIRNAC Quarry 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.	9.1.1.3
CIRNAC Land Lease 66A/8-72-5	The lessee shall submit to the Minister every 2 years after the commencement date of this lease, a report describing cumulative variations from the C&R Plan with updated cost	9.2.1.2

Condition 37	estimates.	
KIA ROW KVRW06F04 Condition 14	Submit to KIA every two years on each anniversary of the commencement date, a report describing any variations from the Abandonment and Restoration Plan and updated cost estimates.	9.2.1.2
KIA ROW 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.	9.1.1.2
KIA ROW 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.	3.4.1
KIA KVPL08D280 Condition 6.01 (9)	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.	9.1.1.1
WHALE TAIL PROJECT		
Authorization Reference	**Reporting Requirement**	**Report Section**
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) The Proponent shall ensure continuous NO2 monitoring is undertaken downwind of mining activities to allow for comparison to relevant standards including the Canadian Ambient Air Quality Standards; d)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 e) 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.	8.14.2
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.	8.14.2
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.	8.15.2
NIRB Project	Result of all noise monitoring undertaken by the Proponent shall be provided to the Nunavut	8.13.1

Certificate No.008 Condition 5	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.	
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.	4.5
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.	5.2.2.2
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.	5.1.2
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.	5.2.2.3
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	5.4.2

NIRB Project Certificate No.008 Condition 11	The Proponent shall develop and implement an Erosion Management Plan to prevent or minimize erosion and its resulting effects from project-related land disturbance.	8.5.3.2.11
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).	9.1.2.1
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.	9.3
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	5.4.2
NIRB Project Certificate No.008 Condition 15	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.	8.7.2
NIRB Project Certificate No.008 Condition 16	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.	8.7.2
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	8.1.2

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.	SECTION 8
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 and Climate Change Canada, maintain a Core Receiving Environment Monitoring Program (CREMP) designed to:	8.1.2
	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.	
NIRB Project Certificate No.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.	3.4.2.2
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.	8.6.2
NIRB Project Certificate No.008 Condition 23	The Proponent shall, reflecting any direction from Environment and Climate Change Canada and Fisheries and Oceans Canada:	8.10
	a) Conduct additional analysis 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	
	c) Monitor actual loadings/concentrations in the receiving environment, identify trends in downstream chemistry and productivity, and track trophic status of Mammoth Lake	
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.	8.8.2.1
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:	8.18.7
	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.	
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.	9.3
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, Inuit Qaujimajatuqangit shared by knowledge holders, 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.	8.18.2
NIRB Project Certificate No.008, Condition 28	The Proponent shall maintain a Terrestrial Ecosystem Management Plan (TEMP) throughout all phases of the Project. The Plan shall include detailed monitoring, mitigation, and adaptive management measures for wildlife, with consideration for each Project activity predicted to affect wildlife, and with inclusion of specific triggers for mitigation and adaptive management intervention. The TEMP shall demonstrate consideration for all relevant commitments made by the Proponent throughout the Nunavut Impact Review Board's review of the Project. Updates to the TEMP may be required when there are significant changes in project development plans, monitoring results indicating biologically-meaningful changes, significant updates to the scientific understanding of management methods relevant to wildlife at the project site, Inuit Qaujimajatuqangit, Traditional Knowledge, changes in climatic conditions that might subject wildlife to unexpected impacts, or as otherwise necessary. 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, including details of how Inuit Qaujimajatuqangit contributed by knowledge holders has been considered and utilized in associated activities and updates.	8.18
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.	8.18.1.4
NIRB Project Certificate No.008 Condition 30	The Proponent shall work with the Government of Nunavut, the Baker Lake Hunters and Trappers Organization and the Kivalliq Inuit Association through the Terrestrial Advisory Group to develop and update thresholds to trigger implementation of mitigation measures on both the AWAR and Whale Tail Haul road, up to and including temporary road closures. The Proponent shall consider how these thresholds and mitigation measures reflect caribou life cycle sensitivities as well as demonstrate how Inuit Qaujimajatuqangit was incorporated throughout the development of these criteria and procedures.	8.18.2
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	11.7.1.2

	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.	
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.	8.18.3
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:	8.18.4
	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	
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:	8.18.5
	· 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.	
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.	8.18.6
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.	8.18.1.11
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.	11.8
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.	11.8.1
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	11.8.1

	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.	
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.	11.8.2
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.	11.8.3
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.	11.9.1
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	11.8.4
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.	11.10.1
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.	11.10.2
NIRB Project	The Proponent should develop a Project-specific Whale Tail Pit Socio-Economic Monitoring	11.10.2

Certificate No 008, Condition 46	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. - Monitor the success of existing and newly implemented gender-specific initiatives to determine their success and why they were considered successful or to identify any challenges to their implementation. 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.	
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.	9.4
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).	11.10.3/11.11.1.1
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	11.11.1.2
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.	11.10.2

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.	11.11.1.4
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. - Includes a Workforce Transition Plan between the Whale Tail Project and other production mines owned and operated by the Proponent in the Kivalliq region. The Proponent shall advance the recommendations of the Conceptual Socio-economic Closure Plan through the development of a Final Socio-economic Closure Plan that will be part of the Whale Tail Pit Project Final Closure and Reclamation Plan.	9.5
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.	11.11.1.3
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.	11.10.2/11.10.3
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.	11.10.1
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.	8.20.1
NIRB Project	The Proponent shall report any archaeological site discovered during the construction,	8.20.1

Certificate No.008 Condition 56	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.	
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.	10.2.2.1
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.	11.11.1.5
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.	11.10.3
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.	11.11.1.5
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.	11.10.3/11.11.1.6
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	11.10.3
NIRB Project Certificate No.008,	The Proponent shall conduct additional studies as part of its freshwater aquatic effects analyses to ensure that methylmercury concentrations anticipated to increase during	8.2

Condition 63	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.	
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.	11.3.1
NIRB Project Certificate No.008, Condition 65	The Proponent shall, in consultation with the Terrestrial Advisory Group, develop a construction plan for the widening of the Whale Tail haul road which includes	3.5.2.3
	- Design features of the Whale Tail haul road intended to facilitate caribou movement across the road;	
	▪ Identified sections of the roadside that will be constructed with slopes and top-dressing material appropriate for caribou crossing.	
	The plan must incorporate available Inuit Qaujimajatuqangit in the selection of caribou crossing locations. The final construction plan shall be provided to the Nunavut Impact Review Board (NIRB) prior to widening the Whale Tail haul road. Within three months of completion of construction to widen the Whale Tail haul road, the Proponent shall file an 'as-built report' with the NIRB, which includes the backfill height, slope and top-dressing material specifications of designed wildlife crossing sections.	
NIRB Project Certificate No.008, Condition 66	The Proponent shall operate the Whale Tail haul road as a private access road, implement any reasonable measures to limit public access to the road, and develop strategies that account for unauthorized use. These measures must include, but are not limited to, the following:	11.7.2.2
	a) The posting of signs in English and Inuktitut at the gate, each major bridge crossing, and each 10 kilometres of road, stating that public use of the road is prohibited;	
	b) Annually advertise and hold at least one community meeting in the Hamlet of Baker Lake to explain to the community that the road is restricted to mine use only;	
	c) Place local notices (e.g., radio, television, social media) at least quarterly to explain to the community that the road is restricted to mine use only;	
	d) Record all unauthorized non-mine use of the road, and require all mine personnel using the road to	
	e) Develop management strategies to ensure public and operator safety in the event of unauthorized public use.	
	Report unauthorized Whale Tail haul road use and accidents or other safety incidents on the road to the Government of Nunavut, the Kivalliq Inuit Association, Crown-Indigenous Relations and Northern Affairs Canada, the Baker Lake Hunters and Trappers Organization and the Hamlet of Baker Lake immediately, and to the Nunavut Impact Review Board annually.	
NIRB Project Certificate No.008, Condition 67	Subject to the additional direction and requirements of the Nunavut Water Board (NWB), the Proponent shall:	4.4.4
	a) Conduct an evaluation of the potential aquatic effects to Lakes D1 and D5 and downstream that may result from the discharge of treated effluent. The evaluation will include: ▪ Additional water quality and phytoplankton baseline data in Lakes D1 and D5 ▪ Updated water balance and water quality forecast ▪ Updated near field and far field effluent discharge modelling ▪ Updated Water Management Plan, Water Quality and Flow Monitoring Plan,	
	b) Provide adequate rationale for the need to use the alternative discharge contingency, based on the thresholds established as per the Whale Tail Pit Expansion Project water management decision tree.	
	c) In the event that discharge to Lakes D1 and/or D5 is not approved to proceed by the NWB, the Proponent will develop alternative effluent management plans as part of the Water Management Plan.	
	At least 90 days prior to any decision to use the effluent discharge alternatives, the Proponent	

	shall submit the requested evaluation, and rationale for use of the effluent discharge alternatives to the Nunavut Water Board, the Nunavut Impact Review Board (NIRB) and relevant regulatory authorities, for approval to proceed with discharge to one or both of Lakes D1 and D5. If the alternative discharge contingency is approved to proceed, the Proponent will submit the results of its monitoring annually to the NIRB.	
NIRB Project Certificate No.008, Condition 68	The Proponent shall maintain an up-to-date listing of the status of implementation for its commitments made during the Nunavut Impact Review Board's (NIRB) assessment of the Whale Tail Pit Project Proposal and the Whale Tail Pit Expansion Project Proposal through engagement of parties and active monitoring of associated implementation. The Proponent shall provide a status report on the implementation of all its commitments within three (3) months of issuance of the Project Certificate for the Whale Tail Pit Expansion Proposal and annually thereafter within its annual report to the NIRB.	11.12
NIRB Project Certificate No.008 Item 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.	11.6.2
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:	SECTION 8
	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.	
NIRB Project Certificate No.008, Item 9	The Proponent shall make significant monitoring results and/or summaries of significant results available in English, Inuinnaqtun, and Inuktitut, to the extent feasible.	10.4.2
NIRB Project Certificate No.008, Item 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.	11.9.7
NIRB Project Certificate No.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.	10.2.2
NWB 2AM-WTP18230, Schedule B, Item 1	a. An overview of methods and frequency used to monitor deformations, Seepage and geothermal responses;	3.1.2.1
	b. A comparison of measured versus predicted performance;	
	c. A discussion of any unanticipated observations including changes in risk and mitigation measures implemented to reduce risk;	
	d. As-built drawings of all mitigation works undertaken;	
	e. Any changes in the design and/or as-built condition and respective consequences of any changes to safety, water balance and water quality;	
	f. Data collected from instrumentation used to monitor earthworks and an interpretation of that data;	
	g. A summary of maintenance work undertaken as a result of settlement or deformation of dikes and dams; and	
	h. The monthly and annual quantities of Seepage from dikes and dams in cubic metres.	
NWB 2AM-WTP1830 Schedule B, Item 2	Monthly and annual volume of fresh Water obtained from Nemo Lake.	4.1.2.1

NWB 2AM-WTP1830 Schedule B, Item 3	Monthly and annual volume of fresh Water obtained from Mammoth Lake.	4.1.2.4
NWB 2AM-WTP1830 Schedule B, Item 4	Monthly and annual volume of fresh Water obtained from Whale Tail Lake.	4.1.2.2
NWB 2AM-WTP1830 Schedule B, Item 5	Monthly and annual volume of fresh Water obtained from Lakes A-P38, A46, A47, A49, A50, A51, A52, A53, A-P21, A-P10, A-P67, and A-P68.	4.1.2.5
NWB 2AM-WTP1830 Schedule B, Item 6	Monthly and annual volume of fresh Water obtained for drilling from sources proximal to drilling sites.	4.1.2.6
NWB 2AM-WTP1830 Schedule B, Item 7	Monthly and annual volume of fresh Water obtained from unnamed water bodies for Whale Tail Haul Road dust suppressant and for the Emulsion plant.	4.1.2.3
NWB 2AM-WTP1830 Schedule B, Item 8	Monthly and annual volume of fresh Water obtained from Lake D1.	4.1.2.7
NWB 2AM-WTP1830 Schedule B, Item 9	Summary of reporting results for the Water Balance and Water Quality model and any calibrations as required in Part E Items 5, 6, and 8.	4.4.2.2
NWB 2AM-WTP1830 Schedule B, Item 10	Geochemical monitoring results	5.1.2
NWB 2AM-WTP1830 Schedule B, Item 11	Volumes of Waste Rock used in construction and placed in the Waste Rock Storage Facility.	5.2.2.1
NWB 2AM-WTP1830 Schedule B, Item 12	Volumes of ore stockpiled and overburden stored at Whale Tail Pit site.	5.2.2.1
NWB 2AM-WTP1830 Schedule B, Item 13	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
NWB 2AM-WTP1830 Schedule B, Item 14	A summary report of all general waste disposal activities including monthly and annual quantities in cubic metres of waste generated and location of disposal	6.1.2
NWB 2AM-WTP1830 Schedule B, Item 15	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	6.2.2
NWB 2AM-WTP1830 Schedule B, Item 16	A list and description of all unauthorized discharges including volumes, spill report line identification number and summaries of follow-up action taken.	7.1.2
NWB 2AM-WTP1830 Schedule B, Item 17	A summary of Modifications and/or major maintenance work carried out on all Water and Waste-related structures and facilities.	11.1.2
NWB 2AM-WTP1830 Schedule B, Item 18	The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I.	8.5
NWB 2AM-WTP1830 Schedule B, Item 19	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.	SECTION 8
NWB 2AM-WTP1830 Schedule B, Item 20	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.	9.1.2.1
NWB 2AM-WTP1830 Schedule B, Item 21	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.	5.4.2

NWB 2AM-WTP1830 Schedule B, Item 22	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.	9.2.2.1
NWB 2AM-WTP1830 Schedule B, Item 23	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.	10.1.2
NWB 2AM-WTP1830 Schedule B, Item 24	Where applicable, revisions as Addenda, with an indication of where changes have been made, for Plans, Reports, and Manuals.	10.2.2
NWB 2AM-WTP1830 Schedule B, Item 25	An executive summary in English and Inuktitut of all plans, reports, or studies conducted under this Licence.	10.4.2
NWB 2AM-WTP1830 Schedule B, Item 26	A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector.	11.5.1
NWB 2AM-WTP1830 Schedule B, Item 28	Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported.	4.6.2/6.3.2
NWB 2AM-WTP1830 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.	10.2.2
NWB 2AM-WTP1830 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).	9.2.2.1
NWB 2AM-WTP1830 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	3.5.2.1
NWB 2AM-WTP1830 Part D, Item 16	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.	3.5.2.2
NWB 2AM-WTP1830 Part E, Item 5	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	4.4.2.2
NWB 2AM-WTP1830 Part E, Item 6	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.	4.4.2.2
NWB 2AM-WTP1830 Part E, Item 8	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.	4.4.3.2
NWB 2AM-WTP1830 Part E, Item 10	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.	4.4.1.2
NWB 2AM-WTP1830 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	3.3.2

	Engineer.	
NWB 2AM-WTP1830 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.	3.2.2
NWB 2AM-WTP1830 Part I, Item 14	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	3.1.2.1
NWB 2AM-WTP1830 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.	8.5.7.2
NWB 2AM-WTP1830 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.	9.1.2.1
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.	3.5.2.1
DFO Authorization 16HCAA-00370 Condition 2.3.3 20HCAA-00275 Condition 2.3.8	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	8.6.2
DFO Authorization 16HCAA-00370 Condition 2.4 20HCAA-00275 Clause 2.3.7	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	8.11.2
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.	3.5.2.1
DFO Authorization 16HCAA-00370 and 20HCAA-00275 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	8.5.1.2
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	8.5.1.2
DFO Authorization 20HCAA-00275 Condition 3.1.1	Demonstration of effective implementation and functioning: Providing dated photographs and inspection reports to demonstrate effective implementation and functioning of mitigation measures and standards described above to limit the impacts to fish and fish habitat to what is covered by this authorization.	8.5.1.2
DFO Authorization 20HCAA-00275 Condition 3.1.2	Contingency measures: Providing 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.	8.5.1.2
DFO Authorization 16HCAA-00370 Condition 3.1.2 20HCAA-00275 Condition 3.2.1	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.	8.5.1.2

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	8.5.1.2
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.	8.5.1.2
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	8.11.2
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.	8.8.2.4
DFO Authorization 16HCAA-00370 Condition 4.2.1.3 and 20HCAA-00275 Condition 5.3.3.5	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	8.8.2.4.5
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.	8.9
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
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.	8.8.2.2
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	8.8.2.2
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	8.8.2.2
DFO Authorization 16HCAA-00370 Condition 5.1.1.5 and 20HCAA-00275 Condition 5.2.2	As part of the annual Whale Tail fish Habitat Offset Monitoring Report, the Proponent shall include, but not limited to:	8.8.2.2
	- 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	
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	8.8.2.3

	to implementation	
DFO Authorization 16HCAA-00370 Condition 5.2.1	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	8.8.2.1
DFO Authorization 20HCAA-00275 Condition 5.2.1	The Proponent shall provide a Whale Tail Expansion Fish Habitat Offset Monitoring Report to DFO including geotechnical and biological and ecological monitoring as per section 5.1.1. The Proponent is required to provide the Report by March 31 of 2027 and update annually for 10 years or until DFO indicates requirements of this Authorization have been met	8.8.2.2
DFO Authorization 20HCAA-00275 Condition 5.2.3	The Proponent shall provide a summary report of all Whale Tail Expansion Fish Habitat Offset Monitoring Reports described in section 5.2.1 before March 31, 2036 to DFO (and interested parties) which shall analyse results from the offsetting measures of the Whale Tail Expansion Project following the construction of the offsetting habitat. DFO reserves the right to request additional Summary Report if annual reporting were to continue until requirement has been met.	8.8.2.2
DFO Authorization 20HCAA-00275 Condition 5.3.2	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 monitoring plans and complementary measures research projects of the Approved Project (PATH No.: 16-HCAA-00370) and adjust the Habitat Evaluation Procedure (HEP) model according to the results generated. The HSI will be used to refine, as necessary, the performance end-points in habitat units for offsetting	8.8.2.1
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.	3.4.2.1
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.	3.4.2.1
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.	8.20.1
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.	9.1.2.3
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.	9.1.2.2
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	11.7.1.2
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.	11.7.1.2
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.	11.7.2.2
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.	11.7.2.2.1

KIA Production Lease KVPL17D01 Condition 6.01 (10)	Deliver to KIA, not later than March 31, 2022 and not later than March 31st every three (3) years thereafter, a Conceptual Reclamation and Closure Plan and Reclamation Estimate, detailing the reclamation and remediation activities taken in the last three (3) years and to be undertaken in the next three (3) years and planned for the balance of the Term. That includes, but not is not limited to the proposed methods and procedure for the progressive […]	9.1.2.1
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.	9.1.2.3
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.	9.1.2.3
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.	9.1.2.3

Table 1-2 Meadowbank and Whale Tail Summary of Samples Stations

MEADOWBANK GOLD PROJECT			
NWB Station	**Description**	**Phase**	**2020 Reporting Status**
ST-DC-1 to TBD	Monitoring stations during Dike Construction as defined in Part D Item 5	Construction	Not applicable in 2020
ST-DD-1 to TBD	Monitoring stations during Dike Dewatering as defined in Part D Item 5	Construction	Not applicable in 2020
ST-1	Water Intake for camp, mill and re-flooding	Water Intake for camp, mill and re-flooding	Section 4.1.1
ST-1W	Water Intake for re-flooding	Water Intake for camp, mill and re-flooding	Not applicable in 2020
ST-3	Water Intake for Emulsion Plant	Late operation, closure	Section 4.1.1.3
ST-4	Water reclaimed from Tailings Storage Facility	Late operation, closure	Not applicable in 2020
ST-5	Portage Area (east) diversion ditch	Late operation, closure	Section 8.5.3.1.2
ST-6	Portage Area (west) diversion ditch	Late operation, closure	Section 8.5.3.1.2
ST-8	East Dike Seepage Discharge	Late operation, closure	Section 8.5.3.1.3
ST-9	Portage Attenuation Pond prior to discharge through Third Portage Lake Outfall Diffuser	Early operation	Not applicable in 2020
ST-10	Vault Attenuation Pond prior to discharge through Wally Lake Outfall Diffuser	Late operation	Not applicable in 2020
ST-11	Tailings Storage Facility	Post closure	Not applicable in 2020
ST-12	Portage/ Goose Pit Lake	Post closure	Not applicable in 2020
ST-13	Vault Pit Lake	Post closure	Not applicable in 2020
ST-14	Discharge to the land from Landfarm sump at mine site	Late operation, closure	Section 8.5.3.1.22
ST-16	Portage Rock Storage Facility	Late operation, closure	Section 8.5.3.1.7
ST-17	North Portage Pit Sump	Operations	Section 8.5.3.1.8
	Portage Pit Lake	Late operation, closure	Section 8.5.3.1.8
ST-19	South Portage Pit Sump	Early operations	Section 8.5.3.1.9
	Portage Pit Lake	Late operations	Section 8.5.3.1.9

ST-20	Goose Island Pit Sump	Early operations	Section 8.5.3.1.10
	Goose Island Pit Lake	Late operations, closure	Section 8.5.3.1.10
ST-21	Tailings Reclaim Pond	Late operations	Section 8.5.3.1.11
ST-22	Tailings Storage Facility	Closure (drainage run-off)	Not Applicable in 2020
ST-23	Vault Pit Sump	Late operations	Not Applicable in 2020
ST-24	Vault Rock Storage Facility	Late operation, closure	Section 8.5.3.1.13
ST-25	Vault Attenuation Pond	Late operation	Section 8.5.3.1.14
ST-26	Vault Pit Lake	Closure	Section 8.5.3.1.12
ST-30	WEP 1	Late operations, closure	Section 8.5.3.1.15
ST-31	WEP 2	Late operations, closure	Section 8.5.3.1.15
ST-32	Saddle Dam 3	Late operations, closure	Section 8.5.3.1.16
ST-S-1 to TBD	Seeps (to be determined)	Late operations, closure	Sections 8.5.3.1.17/8.5.3.1.18
ST-GW-1 to TBD	Groundwater wells (to be determined)	Late operations, closure	Section 8.7.1
ST-AEMP-1 to TBD	Receiving AEMP	Late operations, closure	Section 8.12
ST-MMER-1 to TBD	Vault, East dike and Portage effluent outfall	Late operations	Section 8.3.1
ST-37	Secondary containment sump at the Bulk Fuel Storage Facility at Meadowbank	Late operation, closure	Sections 8.5.5.1
ST-38	Secondary containment at the Bulk Fuel Storage Facility in Baker Lake - Jet-A containment	Late operation, closure	Sections 8.5.5.2
ST-40.1	Secondary containment sump at the Bulk Fuel Diesel Storage Facility in Baker Lake (Fuel tanks 5&6)	Late operation, closure	Sections 8.5.5.2
ST-40.2	Secondary containment sump at the Bulk Fuel Diesel Storage Facility in Baker Lake (Fuel tanks 1-4)	Late operation, closure	Sections 8.5.5.2
ST-40.3	Secondary containment sump at the Bulk Fuel Diesel Storage Facility in Baker Lake (Fuel tanks 7-8)	Late operation, closure	Sections 8.5.5.2
ST-41	Phaser Pit Sump	Late operations	Section 8.5.3.1.19
ST-42	BB Phaser Pit Sump	Late operations	Section 8.5.3.1.20
ST-43	Phaser Attenuation Pond	Late operations	Section 8.5.3.1.21
WHALE TAIL PROJECT			
NWB Station	**Description**	**Phase**	**2020 Reporting Status**
ST-WT-DC-1 to TBD	Monitoring stations during Dike Construction as defined in Part D Item 5	Construction	Not Applicable in 2020
ST-WT-DD-1 to TBD	Monitoring stations during Dike Dewatering as defined in Part D Item 5	Construction	Section 8.5.2.2 and Appendix 39
ST-WT-S-1 to TBD	Seeps (to be determined)	Operations	Section 8.5.3.2.7
		Closure	Not applicable in 2020
ST-WT-GW-1 to TBD	Groundwater wells (to be determined) as required under Groundwater Monitoring Plan	Operations	Section 8.7.2
		Closure	Not applicable in 2020
ST-WT-1	Attenuation Pond, pre-treatment	Operations	Section 8.5.3.2.1

ST-WT-2	Attenuation Pond, post-treatment; last point of control before discharge to Mammoth Lake via the West Diffuser	Operations	Section 8.5.3.2.13.1
ST-WT-2a	Attenuation Pond, post-treatment; last point of control before discharge to Mammoth Lake via the East Diffuser	Operations	Section 8.5.3.2.13.1
ST-WT-2b	Attenuation Pond, post-treatment; last point of control before discharge to Mammoth Lake via the Winter Diffuser	Operations	Not applicable in 2020
ST-WT-3	Waste Rock Storage Facility (WRSF) Pond prior to pumping to Attenuation Pond	Operations Closure	Section 8.5.3.2.2
	Waste Rock Storage Facility (WRSF) Pond prior to discharge to Mammoth Lake	Post-Closure	Not applicable in 2020
ST-WT-4	Whale Tail Pit or pit sump	Operations	Section 8.5.3.2.3
ST-WT-5	Water Intake from Nemo Lake	Construction Operations	Sections 4.1.2.1
ST-WT-6	Lake A47	Construction Operations Closure	Sections 8.5.3.2.5
ST-WT-7	East diversion channel	Operations	Not applicable in 2020
ST-WT-8	Water Intake from Whale Tail Lake	Closure	Not applicable in 2020
ST-WT-9	North Whale Tail Lake (as the basin fills and when it is connected to the south basin and prior to or when connected to the downstream environment)	Closure Post-Closure	Not applicable in 2020
ST-WT-10	Pit Lake (as the Pit fills)	Closure Post-Closure	Not applicable in 2020
ST-WT-11	Sewage Treatment Plant	Operations Closure	Section 8.5.4.2
ST-WT-12	Secondary containment at Whale Tail Bulk Fuel Storage Facility	Operations Closure	Section 8.5.5.3
ST-WT-13	Lake A45	Operations Closure	Section 8.5.3.2.6
ST-WT-14	Lake A16 outlet	Construction Operations Closure	Section 8.5.3.2.7
ST-WT-15	Lake A15	Construction Operations Closure	Section 8.5.3.2.8
ST-WT-16	Secondary containment at Whale Tail Bulk Fuel Storage Facility Power Plant	Operations Closure	Section 8.5.5.3
ST-WT-17	Whale Tail Dike Seepage	Operations Closure	Section 8.5.3.2.9
ST-WT-18	IVR Pit or IVR Pit sump	Operations	Section 8.5.3.2.4
ST-WT-19	IVR Pit Lake (as the pit fills)	Closure and post-closure	Not applicable in 2020
ST-WT-20	Groundwater Storage Pond 1 (GSP-1)	Operations	
ST-WT-21	Groundwater Storage Pond 2 (GSP-2)	Operations	Not applicable in 2020
ST-WT-22	Groundwater Storage Pond 3 (GSP-3)	Operations	Not applicable in 2020
ST-WT-23	IVR Attenuation Pond, pre-treatment	Operations Closure	Not applicable in 2020
ST-WT-24	IVR Attenuation Pond, post-treatment; last point of control before discharge to Whale Tail South Basin via the Permanent Diffuser	Operations	Not applicable in 2020
ST-WT-24a	Whale Tail Attenuation Pond, post-treatment; last point of control before discharge to Whale Tail South Basin via the Temporary Diffuser	Operations	Section 8.5.3.2.13.2
ST-WT-24b	Whale Tail Attenuation Pond, post-treatment; last point of control before discharge to Whale Tail South Basin via the Permanent Diffuser	Operations	Section 8.5.3.2.13.2

ST-WT-25	Whale Tail Pit Lake (North Wall)	Closure	Not applicable in 2020
ST-WT-26	Whale Tail South Water Transfer to Mammoth Lake Permanent Diffuser	Construction	Not applicable in 2020
ST-WT-26a	Whale Tail South Water Transfer to Mammoth Lake Temporary Diffuser	Construction	Not applicable in 2020
ST-WT-27	Discharge from Landfarm	Operations Closure	Not applicable in 2020
ST-WT-28	IVR WRSF Pond prior to pumping to Attenuation Pond	Operations Closure	Not applicable in 2020
ST-WT-29	Water intake from Lake D1	Closure	Not applicable in 2020
Quarry 1	Quarry 1 discharge to Mammoth Lake	Operations	Section 8.5.3.2.12
NE Pond	NE Pond discharge towards Nemo Lake	Operations	Section 8.5.3.2.11

SECTION 2. SUMMARY OF ACTIVITIES

2.1 2020 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.

The second quarter of 2020 started in reduced operating mode due to measures in response to the COVID-19 pandemic. The open pit operation was reduced to 50% capacity in April. Operations were gradually ramped up in May as temporary workers were added to support mining activities. The processing plant was on care and maintenance for most of the second quarter of 2020, re-starting on May 28th, 2020, and returned to full production levels with higher grade ore by June 13th, 2020. The reduction in activities and suspension of the mill for most of the second quarter of 2020 caused a substantial reduction in production and a corresponding increase in unit costs. In addition, the mining operation has now fully transitioned from the Meadowbank deposit to the Amaruq satellite deposit, which has affected the cost structure.

The delineation of higher-grade mineralization at depth below the proposed open pits at Amaruq led to the decision to construct an exploration ramp into the Whale Tail deposit in 2017. Ramp development commenced in 2018 using a phased approach in order to manage capital costs. In 2020, work on the underground project was reduced due to the restrictions on mining activities in the second quarter of 2020 in response to the COVID19 pandemic and as the Company focused its priorities on completing the ramp up of open pit mining activities at Amaruq. With mining operations now on a strong footing at the Meadowbank Complex, the Amaruq underground project has now been approved for development and first gold production is expected in early 2022. The objective is to mine higher-grade underground portions of the deposit in conjunction with the open pits.

At the Meadowbank Complex, the production guidance is in line with Previous Guidance for 2021 and lower for 2022. The expected decrease in production in 2022 is primarily due to the delay in the Amaruq underground project as a result of the COVID-19 related reduction in activities in the second quarter of 2020. The Company currently forecasts approximately 45,000 ounces of gold being produced from underground operations in 2022, compared to 50,000 to 60,000 ounces forecast in the Previous Guidance.

At the Meadowbank Complex, the Company expects to spend $7.0 million for 34,900 metres of drilling, including 23,900 metres of conversion and 11,000 metres of exploration drilling, focused at testing open-pit extensions and further underground potential of the deposits at the Amaruq satellite operation.

The 2020 highlights for the Meadowbank Gold Project and Whale Tail Project include:

- Commercial production at the IVR Pit was achieved on December 31st, 2020.

- During 2020, payable gold production at Meadowbank totaled 198,418 ounces at a production cost per ounce of $1,436.

- In the full year 2020, gold production, excluding pre-commercial ounces, increased when compared to the prior year. Commercial production tonnes were higher in 2020 compared to the prior year as a significant portion of the ore processed in 2019 was pre-commercial. Gold production, including pre-commercial production, was higher primarily due to higher gold grades as the Amaruq pit deepens, partially offset by lower throughput levels related to the reduction of activities in the second quarter of 2020 as described above.

Every year, the caribou migration is factored into the Company's production plan. This migration can impact the ability to move materials on the road between Amaruq and Meadowbank and between Meadowbank and Baker Lake. Wildlife management is an important priority and the Company is working with Nunavut stakeholders to find the best solutions to safeguard wildlife and minimize production disruptions.

Quarterly progress reports, providing further details of activities throughout the 2020 year, were prepared for the Kivalliq Inuit Association as required by Production Lease KVPL08D280 and KVPL17D01.

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

Figure 1 Meadowbank Site 2020Sampling Locations

Figure 2 EEM Receiving Environment 2020 Sampling Locations

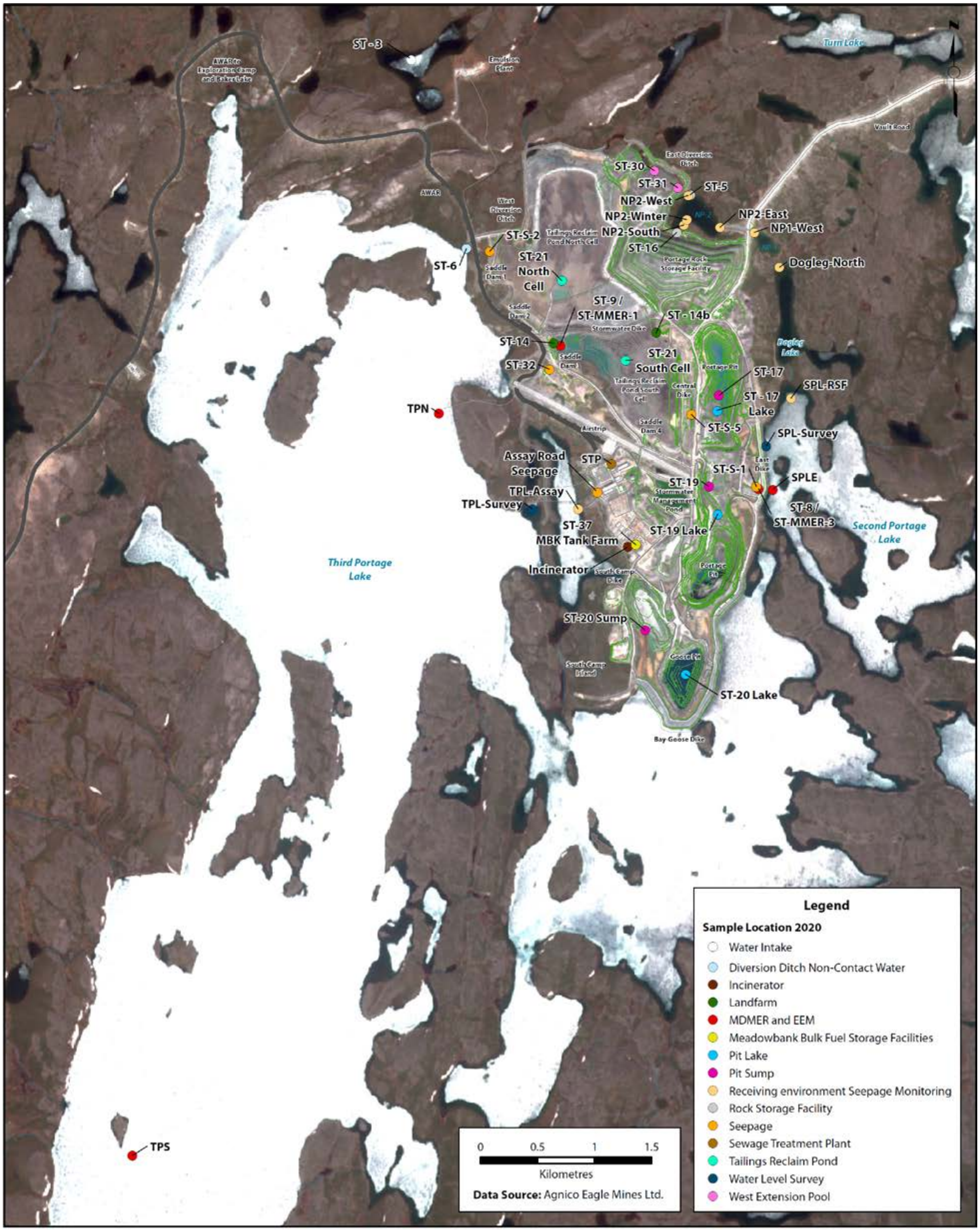


Figure 3 Vault Area 2020 Sampling Locations

Figure 4 Whale Tail Area 2020 Sampling Locations

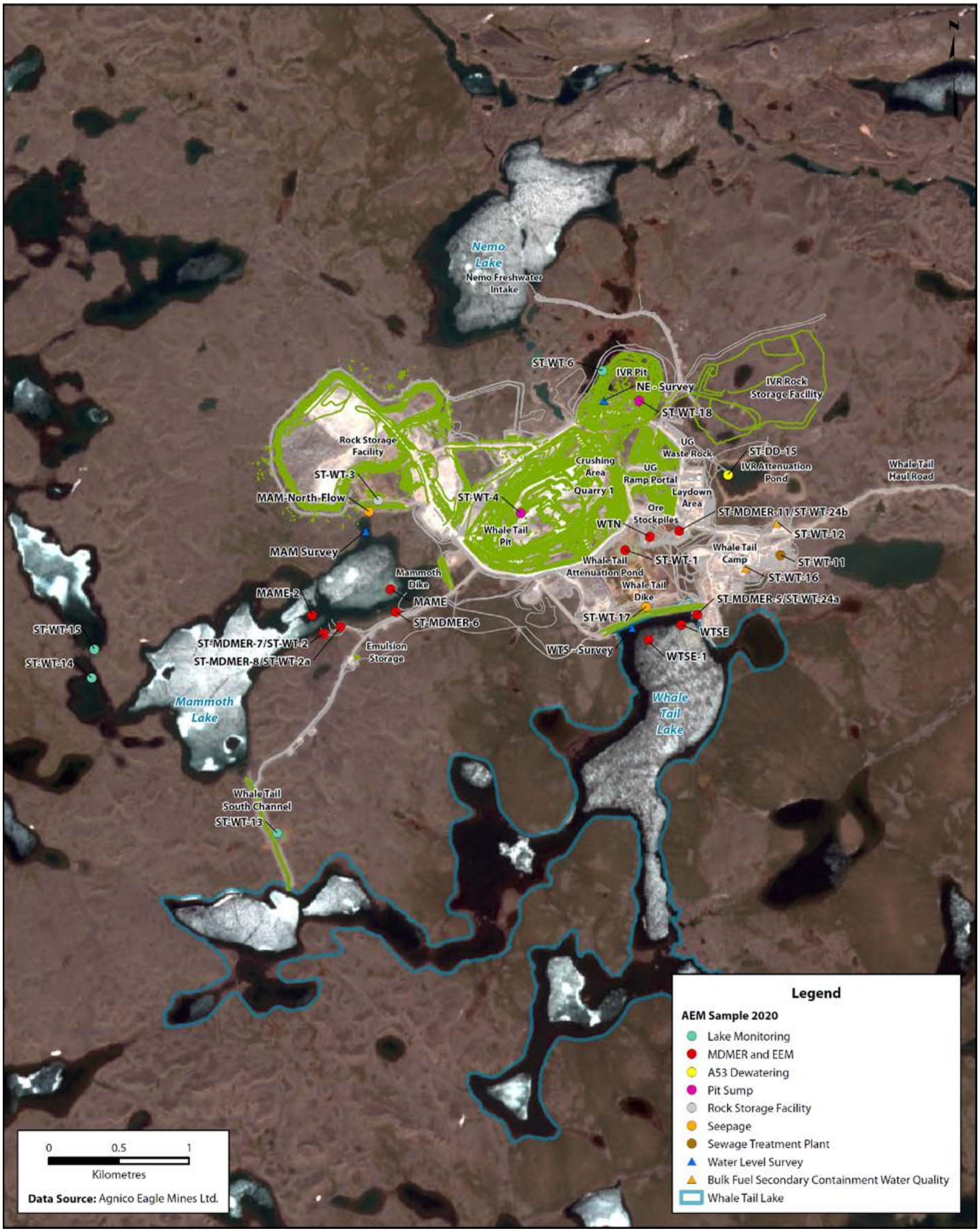


Figure 5 General View from Baker Lake to Whale Tail Project

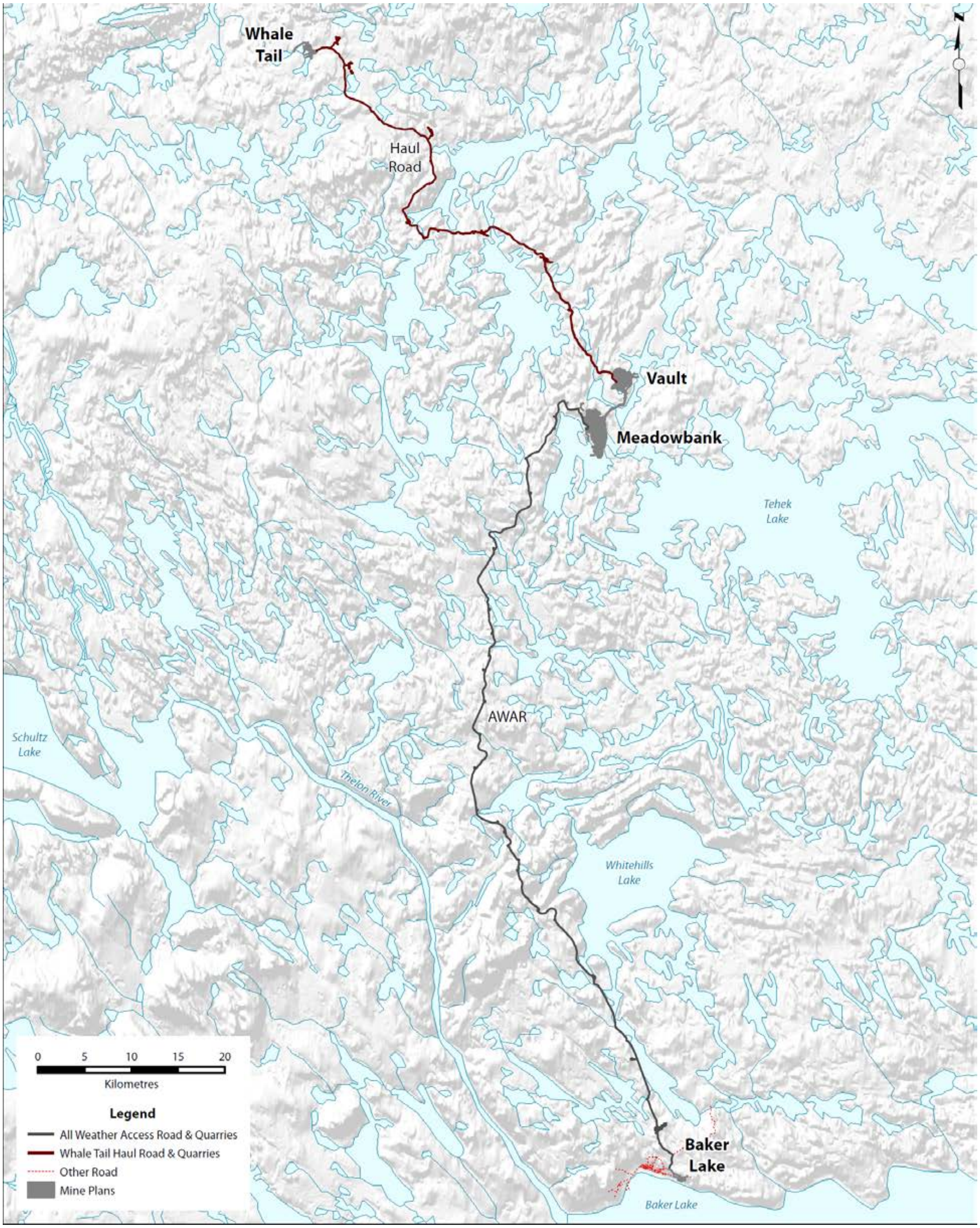


Figure 6 Baker Lake Marshalling Area 2020 Sampling Locations

2.2 2021 MINE PLAN / WORK PLAN

2.2.1 2021 Mine Plan Meadowbank Site

The "2021 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 KivIA on January 7th, 2021, and outlines the activities planned for the project throughout the 2021 year.

The Meadowbank gold mine began the operation phase of the project in February 2010, and thus, is entering its twelfth year of operations. In addition to routine activities throughout the 2021 season, a number of secondary construction/modification projects will be undertaken near the main mine site area and Vault area. Tailings will be mainly deposited in the pit (Portage Pit A and Portage Pit E). Some tailings deposition might occur in the North and South Cell to optimize the landform.

In 2021, no mining activity is planned to occur at Meadowbank as all the pit resources were exhausted in 2019. As no mining is planned, there is no waste rock planned to be managed.

Environmental monitoring (wildlife, aquatic effects, groundwater, noise and air) will continue through 2021 in support of all operational undertakings at the Meadowbank site as required by the NWB Type A Water License 2AM-MEA1530, NIRB Project Certificate No.004, DFO authorizations and MDMER regulations.

2.2.2 2021 Work Plan Whale Tail Site

The "2021 Work Plan" for the Whale Tail Pit Project, prepared for the Kivalliq Inuit Association as required by Production Lease KVPL17D01, is attached in Appendix 3. This report was submitted to the KivIA on January 7th, 2021, and outlines the activities planned for the project throughout the 2021 year.

The Whale Tail Project mine began the commercial production on September 2019, and thus, will be completing its second year of production in 2021. In addition to routine activities throughout the 2021 year, a number of secondary construction/modification projects will be undertaken near the main mine site. Ore will continued to be hauled to Meadowbank Mine for milling process.

The 'Whale Tail Haul Road 2021 Work Plan', prepared for the KivIA as required by Lease KVRW15F01, is attached in Appendix 4. This report was submitted to the KivIA on January 15th, 2021, and detailed planned road maintenance and operation activities along the Whale Tail Haul Road throughout the 2021 year. Environmental monitoring (wildlife, dust suppression, waste management, air and water quality) will continue through 2021.

On January 15th, 2020, Agnico submitted to KivIA the '2021 Work Plan' for Quarry/Esker Permits KVCA15Q01 and KVCA18Q01 (Appendix 5 and 7 respectively). Work Plan for KVCA15Q02 was submitted on March 10th, 2021 (Appendix 6). These Work Plans detail planned activities for the quarry/esker along the Whale Tail Haul Road throughout the 2021 year. As per the Work Plan, Agnico is currently not planning to remove esker and quarry material in 2021. Environmental monitoring will continue through 2021.

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 8), 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-MEA1530, 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 structures include site observation, inspection and instrument monitoring. Details of these surveillance programs and their frequencies are presented in the surveillance section of the TSF Operation Maintenance and Surveillance (OMS) Manual and in the Dewatering Dike OMS Manual.

The main surveillance activities are:

- Site observation – conducted by personnel 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 conditions and weekly during period of flow) and targeting specific activities

- Instruments monitoring – includes the review of instrumentation data including thermistors, piezometers, inclinometers, blast monitoring, seepage flow monitoring, and 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)

- Annual geotechnical inspection – comprehensive technical inspection integrating inspections and results of monitoring instruments. Done by an external geotechnical engineer on a yearly basis. Results are presented to the Independent reviewer (Meadowbank Dike Review Board)

- Independent Review Board Meeting (MDRB) - An annual MDRB meeting is held every year. The following topic are part of the annual MDRB scope of work:
  - Site visit (during period of flow) of all infrastructure covered by the scope of the MDRB;
  - Review of mine waste management strategy (including tailings and waste rock storage facilities);
  - Review water management infrastructure designs and performance (including water retaining infrastructures);
  - Review of on-going construction works and monitoring data;

- Provide opinions and guidance to the operation on the physical integrity, safety, behavior, and performance of the confinement systems for mine waste and water retaining infrastructures.

b. A comparison of measured versus predicted performance;

A detailed comparison and analysis of the measured versus predicted performance can be found in the 2020 Annual Geotechnical Inspection Report presented in Appendix 9. 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. A green level means that the performance of the structure is per normal operating condition while yellow means that 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 Dikes 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	Green (normal operating condition)	Presence of healed tension crack. Situation is stable
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 historically high seepage rate through bedrock

			foundation

At Central Dike, the performance of the structure is deviating from normal operating condition due to the presence of a high amount of seepage through the bedrock foundation. This condition started in 2014 and is still ongoing on 2020, but to a much lesser extent. Further discussion on the risk and mitigation measures is included in Section c) below.

More details are available in the 2020 Annual Geotechnical Inspection available in Appendix 9 and in the 2020 Water Management Report and Plan Version 9 (Appendix 11).

North Cell Internal Structure

During freshet of 2020 some local signs of instability (sloughing & tension cracks) were observed in the fine filter layer of the NCIS structure on the Eastern side of the North Cell. These signs of instability seemed to be caused by water channeling at the upstream area of the structure and which undercut the upstream toe.

These instabilities are located only in the fine filter layer and do not pose a risk to the performance of the structure. These events were surveyed and did not progress in the summer. A remediation plan will be implemented in 2021 to repair the damage observed and ensure that water stops channeling at the toe of the structure.

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 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.

Historically the Central Dike seepage was 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 result 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.

In July 2019 tailings deposition was switched to Goose Pit and the Central Dike seepage was directed in Pit A. This had the impact of further decreasing the Central Dike seepage rate which reached 50 m^3/hr at the end of 2019. The yearly seepage rate trend has remained stable since then. This value is similar to the value from the 2017 seepage modelling done by Golder in closure condition for the South Cell.

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 through 2020.

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

- maintain 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 minimize the amount of water stored in the South Cell by promoting in-pit tailings deposition and redirecting the Central Dike seepage in Portage Pit when feasible.

<u>Recommendation from the 2020 Annual Geotechnical Inspection and MDRB 28 on Central Dike Situation:</u>

- No new recommendations.

<u>Recommendation from the 2020 Annual Geotechnical Inspection and MDRB 28 on the North Cell Internal Structure Situation:</u>

- Corrective measures to repair the fine filter layer were recommended before tailings deposition or capping operations resume in the North Cell. Agnico is planning to implement a corrective action plan.

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

No mitigation work was performed on any dikes in 2020.

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 2020.

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

Sections 3.0 and 5.0 of the 2020 Annual Geotechnical Inspection by Golder, provided in Appendix 9, present the instrumentation data collected in 2020 and their interpretation.

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

No major remediation work on the structures was undertaken in 2020.

Table 3-2 presents the monthly quantities of seepage from dikes. More information can be found in the 2020 Water Management Report and Plan Version 9 (Appendix 11).

Table 3-2 Monthly volume of seepage (m^3) pumped at Meadowbank in 2020

Seepage	Central Dike			East Dike	
Discharge	South Cell (TSF)	Pit A	Pit E	Second Portage Lake	Portage Pit
January	38,029	0	0	13,410	0
February	16,704	0	12,338	12,537	0
March	0	0	36,347	13,949	0
April	0	0	29,543	12,548	0
May	0	0	28,065	14,632	0
June	0	0	131,338	2,040	14,789
July	0	136,921	0	0	17,027
August	0	130,000	0	0	16,476
September	0	59,329	0	0	16,476
October	0	69,033	0	2,927	8,702
November	0	30,903	0	8,401	0
December	0	21,724	0	9,053	0
Total	**54,734**	**447,910**	**237,631**	**89,497**	**73,470**

3.1.2 Whale Tail Site

3.1.2.1 *Performance Evaluation*

As required by NWB Water License 2AM-WTP1830 Part I, Item 14: ***The Licensee shall submit the results and interpretation of the Seepage monitoring required in Part I Item 13 in the Annual Report required under Part B, Item 2***

And

As required by Water License 2AM-WTP1830, Schedule B, Item 1*:*

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

The surveillance program for the water management infrastructure include site observation, inspection and instrument monitoring. Details of these surveillance programs and their frequencies are presented in the surveillance section of the Whale Tail Water Management Infrastructures Operation Maintenance and Surveillance (OMS) Manual.

The main surveillance activities are:

- Site observation – conducted by personnel 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 conditions and weekly during period of flow) and targeting specific activities

- Instruments monitoring – includes the review of instrumentation data including thermistors, piezometers, inclinometers, blast monitoring, seepage flow monitoring, and 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)

- Annual geotechnical inspection – comprehensive technical inspection integrating inspections and results of monitoring instruments. Done by an external geotechnical engineer on a yearly basis. Results are presented to the Independent reviewer (Meadowbank Dike Review Board)

- Independent Review Board Meeting (MDRB) - An annual MDRB meeting will be held every year. The following topic are part of the annual MDRB scope of work:
  - Site visit (during period of flow) of all infrastructure covered by the scope of the MDRB;
  - Review of mine waste management strategy (including tailings and waste rock storage facilities);
  - Review water management infrastructure designs and performance (including water retaining infrastructures);
  - Review of on-going construction works and monitoring data;
  - Provide opinions and guidance to the operation on the physical integrity, safety, behavior, and performance of the confinement systems for mine waste and water retaining infrastructures.

b. A comparison of measured versus predicted performance;

A detailed comparison and analysis of the measured versus predicted performance can be found in the 2020 Annual Geotechnical Inspection report presented in Appendix 9. This assessment is based on visual inspection and analysis of instrumentation monitoring.

Table 3-3 presents the updated Trigger Action Response Plan (TARP) level of each dike at the Whale Tail Site which is an indicator of measured versus predicted performance. A green level means that the performance of the structure is per normal operating condition while yellow means that 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 3-3 Operating Condition of Dikes at Whale Tail

Structure	Type	TARP Level	Comments
Mammoth Dike	Dewatering Dike	Green (normal operating condition)	Level was increased to Yellow due to Mammoth Lake water level and decreased to Green in July 2020
North East Dike	Dewatering Dike	Green (normal operating condition)	Dismantled in summer of 2020
Whale Tail Dike	Dewatering Dike	Yellow (deviation from normal operating condition)	Due to high seepage rate underneath the embankments in the foundation
WRSF Dike	Dewatering Dike	Green (normal operating condition)	TARP level was decreased from yellow to green in May 2020 following remediation work completion

At Mammoth Dike, the performance of the structure was deviating from normal operating in the first half of 2020 due to the water level in Mammoth Lake being over the normal dike operating level. This condition started in December 2019. The TARP level was decreased to Green in July 2020 after the water level decreased below the normal dike operating level and Mammoth Lake outlet was observed to be fully thawed. Further discussion on the risk and mitigation measures is included in Section c) below.

At Whale Tail Dike, the performance of the structure is deviating from normal operating condition due to a high seepage rate underneath the embankments in the foundation. This condition started in May 2019. Further discussion on the risk and mitigation measures is included in Section c) below.

At WRSF Dike, the performance of the structure was deviating from normal operating condition due to seepage observed in August 2019. The TARP level was decreased to Green in May 2020 after the mitigation works were completed. Further discussion on the risk and mitigation measures is included in Section c) below.

More details are available in the 2020 Annual Geotechnical Inspection available in Appendix 9 and in the 2020 Water Management Report Version 6 (Appendix 12).

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

<u>Mammoth Dike</u>

In December 2019 the TARP level of Mammoth Dike was increased to yellow due to the water level in Mammoth Lake being over the normal dike operating level. The water level increase was due to pumping of water from Whale Tail Lake South to Mammoth Lake while Mammoth Lake outlet was frozen preventing water from flowing to the nearby lakes. The risk associated with this event is overtopping of the dike liner, possibly causing damage to the dike and allowing water to flow to the Whale Tail Pit area.

The mitigation strategy to reduce the risks related to overtopping the dike liner included the following:

- The pumping of water to Mammoth Lake was halted in December 2019. It was decided to discharge water form the site to Whale Tail South until the outlet of Mammoth Lake thawed.

- Increased surveillance frequency of the water level in Mammoth Lake (instrumentation review, site observation).

- The hydrology was reviewed to understand the impact of having higher starting water level in Mammoth lake at freshet. This action led to a re-evaluation of the operating level at Mammoth Dike.

- Preparation of an action plan linked to a decision tree if the water level are higher than those expected at freshet. One such action taken was to modify the water management plan to have the possibility to transfer water from WTS to Mammoth Lake by pumping at the end of freshet to create additional storage capacity in WTS to be able to discharge water from the site when the outlet of Mammoth Lake is still frozen.

Following the decrease of the Mammoth Lake level and the thawing of the outlet, the TARP level was decreased to Green in July 2020. The action plan remains in place to prevent another occurrence.

Whale Tail Dike

In May 2019 the TARP level of Whale Tail Dike was increased to yellow due to indications of a high seepage rate underneath the embankments in the foundation. Indicators of the seepage during the summer of 2019 included:

- Cracks, settlement and circular depression observed on the structure (due to permafrost degradation)

- Some thermistors showing warming sign inferring seepage through the foundation

- Seepage streams observed on the downstream side of the structure

As a result of the seepage the TARP level was increased and the following actions were taken :

- Seepage streams were cleared from boulders and two (2) V-notch weirs were installed to monitor the flow. A trench was installed to gather the seepage streams

- Additional thermistor were installed on the structure

- Increased frequency of visual observation and seepage measurement using V Notch

- Increase monitoring of water quality in seepage stream

- Grout committee was formed to develop mitigation measure

- Investigation campaign (Willowstick) was done to increase understanding of potential seepage pathway

A remediation grouting campaign was conducted between November 2019 and March 2020 under the direction of the grout committee. The remediation works were successful in reducing the seepage rate to manageable levels, thus preventing risks of flooding the Whale Tail Pit area. A permanent seepage collection and pumping system was built downstream of Whale Tail Dike and is partly operational, with additional works required to convey all the surface seepage to the four pumping stations.

WRSF Dike

In August 2019 the TARP level of the WRSF Dike was increased to yellow due to seepage observed toward Mammoth Lake. Review of the thermistor data indicated that the most likely cause for the seepage observed was thawing of the foundation keytrench caused by water ponding over it for an extended period of time. The seepage at the downstream toe was estimated to be around 100 m^3/h. Tension cracks along the downstream crest of the dike were also observed. This event was disclosed to the relevant authorities and measures were taken to lower the WRSF pond level. Once the WRSF pond level was lowered the seepage was no longer observed. The risk associated with this event is potential contaminant release to Mammoth Lake and the area downstream of the dike as well as possible damage to the dike. Analyses performed after the event showed that this release did not cause impact to the water quality of Mammoth Lake.

The current mitigation strategy to reduce the risks of reoccurrence of seepage to Mammoth Lake and the area downstream of the dike as well as possible damage to the dike include the following:

- Increased surveillance frequency (instrumentation review, site observation)
- Review the operating level of the structure to minimize water ponding over the key trench and ensure sufficient pumping capacity to comply to the operating level
- Build an upstream berm to mitigate the risk of foundation thawing (completed in Q2 2020, before freshet)

Following the completion of the mitigation measure the TARP level was decreased to Green. These mitigation measures were successful and no seepage was observed at WRSF Dike in 2020.

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

Mitigation work was initiated in 2019 on Whale Tail Dike (grouting, seepage collection system). This mitigation was completed in Q2 2020. Remediation work was also done on WRSF Dike in Q2 2020.

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

Please refer to Section 3.5.2 for as-built construction report.

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

Section 4.0 of the 2020 Annual Geotechnical Inspection by Golder provided in Appendix 9, presents the instrumentation data collected in 2020 and their interpretation.

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

Mitigation work was initiated in 2019 on Whale Tail Dike (grouting, seepage collection system). This mitigation was completed in Q2 2020. Remediation work was also done on WRSF Dike in Q2 2020.

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

Visual and v-notch weir seepage rate estimates were used to calculate the seepage rates from the Whale Tail Dike, however part of the seepage is believed to report underground to the attenuation pond without pumping. More information can be found in the Water Management Plan Version 6 (Appendix 12).

The total seepage flow at the downstream was estimated at 68-89 m^3/h during the summer of 2020.

3.2 MEADOWBANK DIKE REVIEW BOARD

3.2.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1530 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 November 2020 (MDRB 28). The MDRB No.28 report, along with Agnico's response to the recommendations are included in Appendix 13. This Appendix 13 includes a summary table of all recommendations and the Agnico implementation plan.

3.2.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1830 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.***

A special meeting of the MDRB was held in June 2020 (MDRB 26). During MDRB 26, activities at the Meadowbank and Amaruq sites as well as the design of the IVR Diversion Channel were discussed. These aspects are presented in a separate report (MDRB No. 26). This report, along with Agnico's response to the recommendations are included in Appendix 14.

A special meeting of the MDRB was held in August 2020 (MDRB 27). During MDRB 27, the status of the design of the IVR Attenuation Pond Dikes were discussed. These aspects are presented in a separate report (MDRB No. 27). This report, along with Agnico's response to the recommendations are included in Appendix 14.

A special meeting of the MDRB was held in October 2020 (MDRB 28A). During MDRB 28A the thermal analyses conducted for the design of the IVR Attenuation Pond Dikes were discussed. These aspects are presented in a separate report (MDRB No. 28A). This report, along with Agnico's response to the recommendations are included in Appendix 14.

During MDRB 28, the operation and performance of the Whale Tail Project water management infrastructures were discussed. The MDRB No.28 report, along with Agnico's response to the recommendations are included in Appendix 13.

Appendix 14 and 13 includes a summary table of all recommendations and the Agnico implementation plan.

3.3 GEOTECHNICAL ENGINEER'S INSPECTION REPORT

3.3.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1530 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 2020 annual geotechnical inspection was performed by Golder in July 2020. The report, along with Agnico's response to the recommendations are included in Appendices 9 and 15. In order to keep the whole interpretation and understanding of the recommendations and responses, Agnico will refer the reader to the Appendix which contains a summary table of all recommendations and the implementation strategy.

3.3.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1830 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 Whale Tail 2020 annual geotechnical inspection was performed by Golder in July 2020. The report, along with Agnico's response to the recommendations are included in Appendices 9 and 15. In order to keep the whole interpretation and understanding of the recommendations and responses, Agnico will refer the reader to the Appendix which contains a summary table of all recommendations and the implementation strategy.

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 72-6, 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 72-6, 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 2020, Agnico blasted 11,111 m^3 of NPAG material from Quarry 18 (Parcel N) along the Meadowbank All Weather Access Road situated on CIRNAC leased land. The 2020 Annual Quarry Report was sent to CIRNAC on February 26th, 2021. The material removed was used on the AWAR for maintenance. No material was blasted in other quarries situated on CIRNAC and KivIA 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 2020.

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. From 2017 to 2019, the presence of falcon and safety concerns prevented the campaign from being completed.

Taking into consideration the results from the 2014, 2016 and 2018 campaign, Agnico Eagle intended to continue to scarify the surface of Quarry 22 in 2020, with the back-end of a grader, allowing ground surface to be aerated thus increasing degradation of PHC.

A bird cannon was deployed on May 23rd to “discourage” the peregrine falcon to establish their nest in that quarry before scarification occurred. The bird cannon was set in the interval *Random 10*, meaning a shot series is randomly chosen by the control-unit between 1 and 10 minutes. The bird cannon was removed once peregrine falcon activity was observed in the quarry. All activity within the area, including scarification, were postponed minimizing the impact of potential 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. Scarification work was performed on September 22nd, 2020 and the samples were collected on September 24th, 2020. Results from the 2020 sampling were compared to the CCME Remediation Criteria for Industrial use of Coarse material and indicate the presence of contamination remnants associated with Fraction 3. When comparing results of 2020 with the sampling done in 2014, 2016 and 2018, levels of contamination appear to be trending down. For the second consecutive sampling campaign, analysis results for fraction 1, 2, and 4 did not exceed CCME in any of the parcel sampled. More details are provided in the Quarry 22 Report in Appendix 18.

Based on the degradation history of PHC's in the Meadowbank Landfarm and upon analyzing results from the 2014, 2016, 2018 and 2020 Q22 soil sampling, Agnico Eagle is confident that the natural degradation of Petroleum Hydrocarbon related products is an effective remediation method for Q22.

In 2021, 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. Deterrents will be installed before the 2021 next nesting season in Quarry 22 at Meadowbank in order to continue the soil decontamination. If the use of deterrents are successful in Quarry 22, Agnico will continue the work previously initiated in this area. However, 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 2021. 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 2021. Results will then be compared to the previous data (2014, 2016, 2018 and 2020) 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 2020, no new material was taken from the Whale Tail Haul Road eskers/quarries on Crown Land. The 2020 Annual Quarry Report was sent to CIRNAC on February 26th, 2021. No material was also removed from eskers/quarries on KivIA leased land. All material required for construction / maintenance activities in 2020 were from previous material already paid for in previous year.

During peak flow of freshet 2020, daily inspection of eskers and quarries along the Whale Tail Haul Road were performed to ensure that runoff, if any, would be free of any visible sheen and would not impact the environment. Freshet leaders were hired in 2020 and were 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 2020.

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 were designed and excavated respecting this 31 metre setback distance.

3.5 2020 CONSTRUCTION

3.5.1 Meadowbank Site

In 2020, the construction activities at the Meadowbank site consisted of the continuation of the construction of the In-Pit Tailings Deposition Project (tailings deposition infrastructures in Pit E). More details regarding the In-Pit Deposition can be found in the 2020 Water Management Plan Version 9 (Appendix 11).

3.5.2 Whale Tail Site

In 2020, the construction activity of the water management infrastructure at the Whale Tail Project included completion of the construction work on the South Whale Tail Channel, remedial grouting of WTD, WRSF Dike seepage mitigation measures (upstream thermal berm, seepage collection system), WTS diffusers, lake dewatering infrastructure for the expansion project and IVR Diversion Channel. The following construction projects were also initiated: seepage collection system at WTD and IVR attenuation pond water management infrastructure (ramp).

Construction was done in accordance with the requirements of the Design and Technical Specifications developed for each structure.

The data collected from the quality assurance (QA) and quality control (QC) program during the various construction activities 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.

North East Dike is the temporary structure required to prevent run-off from the northeast watershed to the Whale Tail pit area. At the end of 2020, North East Dike was dismantled as part of the IVR Pit development.

WRSF Dike is the structure built to contain contact water generated by snow melt and runoff from direct precipitation on the waste rock stockpile that has the potential to be acid generating. In 2020, seepage mitigation measures (upstream thermal berm) were implemented and construction activity included foundation preparation, fill placement (rockfill, esker and esker amended with bentonite), and geotextile installation. The downstream collection system is a low point for pumping any potential seepage. A sump was also excavated in the WRSF pond (upstream of the dike) to control the water level by pumping.

Whale Tail Dike is the structure to isolate the North portion of Whale Tail Lake for dewatering and provides access to the Whale Tail pit area. In Q2 2020, the additional grouting works started in 2019 and aimed at mitigating the seepage were completed. The seepage collection system construction was continued and is planned to be completed in 2021. The construction will be reported on in the 2021 Annual Report.

The South Whale Tail Channel is a channel that will ensure that water is able to flow from Whale Tail South to Mammoth Lake. Work was completed in Q2 2020.

The IVR Diversion Channel is a channel that will ensure that non-contact water is able to flow from the North-East watershed to Nemo Lake. Work was completed in Q3 2020 with the installation of geotextile at the inlet and outlet. It will be commissioned at freshet 2021.

Other elements were built at the Whale Tail site in 2020:

- Mammoth Lake Diffuser: composed of three (3) permanent diffusers for discharge into Mammoth Lake.

- Whale Tail Attenuation Dewatering Ramp: the infrastructure required to install the pumping infrastructure needed for the operation of the Whale Tail Attenuation Pond.

- Whale Tail North Dewatering System: the objective of this system was to dewater Whale Tail North (WTN) to free up the footprint required for the mining of the Whale Tail Pit and to establish the Whale Tail Attenuation Pond

- A53 to Whale Tail South Pumping System: built and commissioned during the dewatering of A53 in the framework of Phase 2 dewatering operations.

- Phase 2 Dewatering System: the objective of this system was to dewater the IVR Pit and WRSF footprint, as well as to start the construction of the IVR Attenuation Pond, located in former lake A53.

3.5.2.1 *Design Report and Construction Drawings*

As required by NWB Water License 2AM-WTP1830 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:***

- ***Water works, including: Water Intake and causeway, Water control structures (dikes, berms, jetties, channels) and Water crossings (culverts, bridges);***
- ***Waste disposal facilities including: Wastewater Treatment Plant, Sewage Treatment Plant, Discharge Diffuser, Waste Rock Storage Facility, Overburden stockpiles, and Landfill; and***
- ***Whale Tail Bulk Fuel Storage Facility***

And

As required by NWB Water License 2AM-WTP1830 Part D, Item 2: ***The Licensee shall submit to the Board for review, at least thirty (30) days prior to Construction, final design and for-Construction drawings accompanied by a detailed report as described in Part D, Item 3 and stamped and signed by an Engineer for infrastructure (such as access roads, jetties, and conveyance systems) used for dewatering the following lakes, as authorized under the Licence: Lakes A47; A49; A-50; A-51; A-52; A53; and A-P21***

And

As required by DFO Authorization 16HCAA-00370 Condition 2.3.5 and 20HCAA-00275 Condition 2.3.9: ***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 and 20HCAA-00275 Condition 2.3.5: ***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.***

2020 was an other important year in the construction of the Whale Tail Project. Table 3-4 below provides 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 address DFO Authorization 16HCAA-00370 Condition 2.3.5 and 2.4.1 and 20HCAA-00275 Condition 2.3.5 and 2.3.9, in 2020, designs for IVR area waterbodies dewatering, Whale Tail South winter and summer diffusers, IVR diversion channel and IVR D-1 dike were submitted to NWB and were available for DFO review. No comments from DFO were received and the construction started once NWB approved the Design Report. Construction summary report, 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-WTP1830) Part D Item 16. DFO has the opportunity to comment all design reports and construction summary report submitted to the NWB. Agnico will continue to construct 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 Whale Tail 2020 List of Design Report Submitted

Design Report	60-day notice Submission to NWB	NWB Design Report Approval
Lakes Dewatering (A46, A47, A49, A50, A51, A53, A-P21)*	May 25, 2020	June 16, 2020
WRSF Instrument Design	May 13, 2020	June 30, 2020
Whale Tail South Winter and Summer Diffusers	June 22, 2020	July 27, 2020
IVR Diversion Channel	June 29, 2020	August 21, 2020
IVR D-1 Dike	December 23, 2020	February 15, 2021

**As per Water License 2AM-WTP1830 Part D, Item 2, Lakes Dewatering (A46, A47, A49, A50, A51, A53, A-P21) design report was submitted at least 30 days in advance*

3.5.2.2 *Construction Summary Report*

As required by NWB Water License 2AM-WTP1830 Part D, Item 16: *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.*

Table 3-5 below provided a list of the 2020 Construction Summary Report submitted to NWB following the completion of the facilities/infrastructures construction. All of the reports 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/D15/)

Table 3-5 Whale Tail 2020 List of Construction Summary Report Submitted

Design Report	Submission to NWB
Whale Tail Dike	November 20, 2020
Whale Tail North Dewatering	October 2, 2020
Baker Lake Tank Farm Expansion- Tank 7	January 16, 2020
Mammoth Lake Summer and Winter Diffusers	September 11, 2020
Road 24 to Whale Tail Diversion Channel and Whale Tail South Diversion Channel	October 6, 2020
Whale Tail Haul Road Km 132 Fuel Tank	October 23, 2020

3.5.2.3 *Whale Tail Haul Road Construction Plan*

As required by Project Certificate No. 008 Condition 65: *The Proponent shall, in consultation with the terrestrial Advisory Group, develop a construction plan for the widening of the Whale Tail Haul Road which includes:*

- ***Design Features of the Whale Tail haul road intended to facilitate caribou movement across the road;***
- ***Identified sections of the roadside that will be constructed with slopes and top-dressing material appropriate for caribou crossing.***

The plan must incorporate available Inuit Quajimajatuqangit in the selection of caribou crossing locations.

There was no widening of the Whale Tail Haul Road in 2020 and there is actually no plan to widening it in 2021.

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-MEA1530 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 2020 was 2,184,110 m^3.

The volume of reclaim water used in the mill in 2020 was 1,362,920 m^3. The volume of freshwater that is contained in the ore to the mill in 2020 was 38,334 m^3.

Table 4-1 Meadowbank 2020 Freshwater Usage

Water Location	Source Lake	Jan	Feb	March	April	May	June	
Camp	Third Portage Lake	3,612	3,264	3,141	2,155	2,484	2,807	
Mill (freshwater tank)	Third Portage Lake	220,085	229,949	270,242	219,998	231,334	130,128	
Emulsion plant	Unnamed Lake	67	76	75	70	114	83	
Total Freshwater Usage (m^3)		**223,764**	**233,289**	**273,458**	**222,223**	**233,932**	**133,018**	
Ore Water (m^3)	Ore	4,668	3,821	2,306	0	534	5,737	
Reclaim Water Usage (m^3)	Tailings Pond	0	0	0	0	864	185,144	
Water Location	**Source Lake**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Total**
Camp	Third Portage Lake	2,966	2,634	2,467	2,584	2,526	2,680	33,320
Mill (freshwater tank)	Third Portage Lake	183,029	170,286	144,040	145,024	79,589	125,812	2,149,515
Emulsion plant	Unnamed Lake	137	116	110	168.2	161.6	99.5	1,274
Total Freshwater Usage (m^3)		**186,132**	**173,036**	**146,617**	**147,776**	**82,276**	**128,591**	**2,184,110**
Ore Water (m^3)	Ore	4,895	3,585	3,135	2,606	3,429	3,618	**38,334**
Reclaim Water Usage (m^3)	Tailings Pond	152,428	161,914	202,706	164,427	240,836	254,601	**1,362,920**

4.1.1.1 *Third Portage Lake*

As required by NWB Water License 2AM-MEA1530 Schedule B, Item 2: ***Monthly and annual volume of fresh Water obtained from Third Portage Lake*.**

A total volume of 2,182,835 m^3 of freshwater was used from Third Portage Lake for the project in 2020, which was in compliance with the Water License Freshwater maximum usage volume of 4,935,000 m^3 (Water License 2AM-MEA1530 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-MEA1530 Schedule B, Item 3: *Monthly and annual volume of fresh Water obtained from Wally Lake*.

As per Type A Water License 2AM-MEA1530 Part E Item 2, Agnico was authorized to withdraw 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 2020.

4.1.1.3 *Unnamed Lake*

Water used from unnamed lake was for the explosive mixing. In 2020, the total of freshwater obtained from unnamed lake was 1,274 m^3. This was compliant with the Water License 2AM-MEA1530 Part E Item 3 which allows 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 4.1.2.8 and Table 4-2 below details the freshwater consumption per source. The total volume of freshwater pumped from the surrounding lakes and used for the Whale Tail Project in 2020, under Water License 2AM-WTP1830, was 40,876 m^3.

Table 4-2 Whale Tail 2020 Freshwater Usage – License 2AM-WTP1830

Water Location	Source Lake	Jan	Feb	March	April	May	June	
Camp	Nemo	2,062	2,184	2,317	1,485	1,845	2,013	
Construction/Operation	Nemo	1,518	1,840	1,284	879	1,967	1,039	
Dust Suppression	Nemo / WTHR Pond	0	0	0	0	0	0	
Explosive	Mammoth Lake	0	0	0	0	0	0	
Drilling	Proximal Sources	0	0	0	0	0	0	
Total Freshwater Usage (m^3)		**3,579**	**4,024**	**3,601**	**2,364**	**3,812**	**3,052**	
Water Location	**Source Lake**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Total**
Camp	Nemo	2,187	2,424	2,620	2,709	2,745	2,826	24,590
Construction/Operation	Nemo	498	1,533	1,935	1,261	1,031	1,050	14,786
Dust Suppression	Nemo / WTHR Pond	1,500	0	0	0	0	0	1,500
Explosive	Mammoth Lake	0	0	0	0	0	0	0
Drilling	Proximal Sources	0	0	0	0	0	0	0
Total Freshwater Usage (m^3)		**4,184**	**3,958**	**4,555**	**3,970**	**3,777**	**3,875**	**40,876**

4.1.2.1 *Nemo Lake*

As required by NWB Water License 2AM-WTP1830 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-WTP1830 to take 209,544 m^3 of water per year from Nemo Lake during operations. Total freshwater consumption in 2020 from Nemo Lake was 39,376 m^3.

4.1.2.2 *Whale Tail Lake*

As required by NWB Water License 2AM-WTP1830 Schedule B, Item 4: *Monthly and annual volume of fresh Water obtained from Whale Tail Lake.*

No freshwater obtained from Whale Tail Lake in 2020.

4.1.2.3 *Unnamed Lake*

As required by NWB Water License 2AM-WTP1830 Schedule B, Item 7: *Monthly and annual volume of fresh Water obtained from unnamed water bodies for Whale Tail Haul Road dust suppressant..*

Agnico Eagle is authorized as per Part E Item 1 of the Water License 2AM-WTP1830 to take 109,135 m^3 of water per year from sources proximal to the Whale Tail Haul Road (WTHR) for dust suppression.

In 2020, 1,500 m^3 of water was taken from the pond along the Whale Tail Haul Road for dust suppression.

4.1.2.4 *Mammoth Lake*

As required by NWB Water License 2AM-WTP1830 Schedule, B Item 3: Monthly and annual volume of fresh Water obtained from Mammoth Lake.

Agnico Eagle is authorized as per Part E Item 1 of the Water License 2AM-WTP1830 Item 1 to take 2,500 m^3 from Mammoth Lake for explosives mixing and associated uses. In 2020 no water was taken from Mammoth Lake.

4.1.2.5 *Lakes in the IVR Footprint*

As required by NWB Water License 2AM-WTP1830 Schedule, B Item 5: *Monthly and annual volume of fresh Water obtained from Lakes A-P38, A46, A47, A49, A50, A51, A52, A53, A-P21, A-P10, A-P67, and A-P68.*

Agnico Eagle is authorized as per Part E Item 1 of the Water License 2AM-WTP1830 to dewater the lakes in the IVR footprint for a total dewatering volume of 153,735 m^3. In 2020, a total volume of 311,144 m^3 was dewatered in July and August 2020. Please refer to the 2020 Water Quality Monitoring Report for Dike Construction and Dewatering in Appendix 39 for a discussion about the dewatering activities.

4.1.2.6 *Fresh Water For Drilling*

As required by NWB Water License 2AM-WTP1830 Schedule, B Item 6: *Monthly and annual volume of fresh Water obtained for drilling from sources proximal to drilling sites.*

Agnico Eagle is authorized as per Part E Item 1 of the Water License 2AM-WTP1830 to use 109,135 m^3 from proximal sources for drilling activities. No water was taken from proximal sources in 2020 for drilling activities.

4.1.2.7 *Lake D1*

As required by NWB Water License 2AM-WTP1830 Schedule, B Item 8: *Monthly and annual volume of fresh Water obtained from Lake D1*.

In 2020, no water was withdrawn from Lake D1.

4.1.2.8 *Underground Activities*

In 2020, a total volume of 2,297 m^3 was discharged from the underground to the GSP1 Pond. Refer to Section 8.5.3.2.14 for more information.

4.2 LAKE LEVEL MONITORING

4.2.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1530 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)*.

In 2020 as in previous year (2015 to 2019) the lake level for Third Portage, Second Portage and Wally lakes remained within the range of naturally occurring levels. Refer to PEAMP Section 12.4.1.1 and Table 12-3 for a complete discussion of the impacts of discharge on water level in the receiving environment. Figure 42 - 45 in Section 12 presents historical trending up to 2020. Overall, modeling predicted the natural range of water levels in Third Portage Lake to be 133.82 – 134.19 masl. (2020 measured value range from 133.63 – 133.75 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.

No water was discharged in Third Portage Lake in 2020. The elevation, in metres above sea level (masl), of Third Portage Lake continued to be monitored in 2020. 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 4-3 and Figure 7. The average water level for TPL in 2020 is 133.68 masl which is between the natural variation of the lake.

Water from the East Dike Seepage was discharged into Second Portage Lake in 2020. The elevation, in metres above sea level, of Second Portage Lake continued to be monitored in 2020. 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 4-3 and Figure 7; the lake level remained within the range of naturally occurring levels. The average for 2020 is 132.97 masl (values range from 132.83 – 133.17).

No water was discharged from the Vault Attenuation Pond in 2020. The elevation measurement, in metres above sea level, of Wally Lake was ongoing in 2020. 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 4-3 and Figure 7; the lake level remained within the range of naturally occurring levels, 139.31 – 139.64 masl. with an average of 139.48 masl.

Following recommendation from CIRNAC regarding the 2018 Annual Report, starting 2019, Turn Lake water level monitoring in the next open water season was completed, reported and compared to predictions. The lake level monitoring results are presented in Table 4-3 and Figure 7. For Turn Lake, no baseline water levels were provided in the 2005 FEIS or 2015 FEIS Addendum for Turn Lake so 2019 was the first year for which measurements are available. Similar water levels were observed in 2020.

Following this analysis, Agnico concluded the water level in Third Portage, Second Portage and Wally Lakes still remain within the range of naturally occurring levels. Natural seasonal variation comparison is not completed, as water elevation surveys are only taken during open water periods Table 4-4 below provide the 2013 -2020 water level monitoring average.

Table 4-3 Meadowbank 2020 Lake Water Level Monitoring

Date	Third Portage Lake (masl)	Second Portage Lake (masl)	Turn Lake (masl)	Wally Lake (masl)
Code Identification	TPL-Survey	SPL-Survey	TL-Survey	WL-Survey
6/6/2020		132.99		
6/14/2020	133.63	132.88		
6/20/2020	133.64	133.01		
6/27/2020	133.73	133.17		
7/6/2020	133.71	133.08	139.31	139.64
7/16/2020	133.75	133.08	139.19	139.51
7/28/2020	133.75	133.01	139.03	139.48
8/1/2020		132.96		
8/13/2020	133.68	132.88	139.01	
8/27/2020	133.63	132.86		
9/8/2020	133.64	132.90		
10/4/2020		132.84		139.31

Figure 7 Meadowbank 2020 Lake Water Level Monitoring

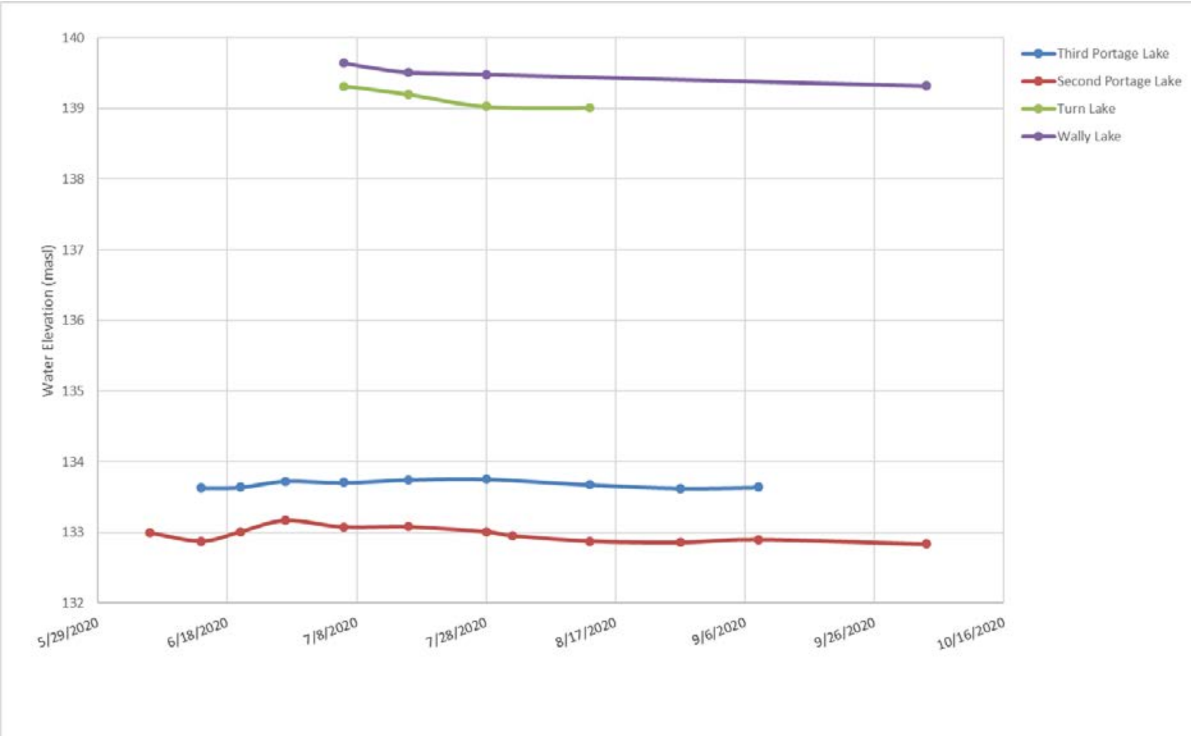


Table 4-4 Meadowbank 2013-2020 Lake Water Level Monitoring Average

Date	Wally Lake (masl)	Second Portage Lake (masl)	Third Portage Lake (masl)	Turn Lake (masl)
Code Identification	**WL-Survey**	**SPL-Survey**	**TPL-Survey**	**Turn Lake-Survey**
2013	139.38	132.94	133.57	NA
2014	139.42	133.26	133.53	NA
2015	139.47	133.12	133.65	NA
2016	139.47	132.95	133.64	NA
2017	139.52	132.92	133.58	NA
2018	139.41	132.96	133.67	NA
2019	139.50	132.94	133.61	139.17
2020	139.48	132.97	133.68	139.13

4.2.2 Whale Tail Site

The elevation, in metres above sea level, of Whale Tail Lake South Basin (range from 155.03 – 155.76), Mammoth Lake (range from 152.21 – 152.98) and Nemo Lake (range from 155.81 – 156.76) were monitored minimally on a weekly basis, during open water season and, weather permitting. Results are presented in Table 4-5 and Figure 8. The location of the lake level survey monitoring is identified as WTS-Survey, MAM-Survey and NEMO-Survey, respectively, on Figure 4. The lake level average results

2018-2020 are presented in Table 4-6. A complete discussion of measured and predicted water levels in the Whale Tail South flood zone is provided in the 2020 Water Quality Monitoring for Dike Construction and Dewatering Report (Appendix 39) For discussion regarding the flooding of the Whale Tail South, North-East Pond are provided in the 2020 Migratory Bird Protection Report (Appendix E of the Wildlife Monitoring Summary Report in Appendix 47). Comparison to FEIS are provided in Section 12.5.1.1 Agnico will refer to these reports for a complete discussion of the results in 2020.

Table 4-5 Whale Tail 2020 Lake Water Level Monitoring

Date	Whale Tail South (masl)	Mammoth Lake (masl.)	Nemo Lake	Date	Whale Tail South (masl)	Mammoth Lake (masl.)	Nemo Lake	Date	Whale Tail South (masl)	Mammoth Lake (masl.)	Nemo Lake	Date	Whale Tail South (masl)	Mammoth Lake (masl.)	Nemo Lake
Code Identification	**WTS-Survey**	**MAM-Survey**	**NEMO-Survey**	**Code Identification**	**WTS-Survey**	**MAM-Survey**	**NEMO-Survey**	**Code Identification**	**WTS-Survey**	**MAM-Survey**	**NEMO-Survey**	**Code Identification**	**WTS-Survey**	**MAM-Survey**	**NEMO-Survey**
14-Jan	155.14	152.82		1-Apr	155.17	152.83		1-Jul	155.62	152.69		1-Oct	155.27	152.40	
15-Jan	155.18	152.82		2-Apr	155.19	152.83		2-Jul	155.60	152.67		2-Oct	155.27	152.40	
16-Jan	155.22	152.82		3-Apr	155.19	152.83		3-Jul	155.59	152.66		3-Oct	155.26	152.39	
17-Jan	155.27	152.82		4-Apr	155.18	152.83		4-Jul	155.58	152.64		4-Oct	155.26	152.39	
18-Jan	155.27	152.82		5-Apr	155.17	152.83		5-Jul	155.57	152.63		5-Oct	155.26	152.38	
19-Jan	155.27	152.82		6-Apr	155.17	152.83		6-Jul	155.55	152.62	156.12	6-Oct	155.25	152.38	155.84
20-Jan	155.26	152.82		7-Apr	155.16	152.83		7-Jul	155.55	152.60		7-Oct	155.24	152.37	
21-Jan	155.26	152.82		8-Apr	155.15	152.83		8-Jul	155.53	152.59		8-Oct	155.24	152.36	
22-Jan	155.26	152.81		9-Apr	155.15	152.83		9-Jul	155.55	152.61		9-Oct	155.24	152.35	
23-Jan	155.26	152.81		10-Apr	155.14	152.83		10-Jul	155.53	152.60		10-Oct	155.24	152.34	
24-Jan	155.26	152.81		11-Apr	155.13	152.83		11-Jul	155.51	152.59		11-Oct	155.24	152.33	
25-Jan	155.26	152.81		12-Apr	155.13	152.83		12-Jul	155.52	152.58	156.15	12-Oct	155.23	152.32	
26-Jan	155.26	152.82		13-Apr	155.12	152.82		13-Jul	155.51	152.56		13-Oct	155.25	152.33	
27-Jan	155.26	152.82		14-Apr	155.11	152.82		14-Jul	155.50	152.54		14-Oct	155.26	152.32	
28-Jan	155.25	152.81		15-Apr	155.11	152.84		15-Jul	155.49	152.53		15-Oct	155.27	152.32	
29-Jan	155.25	152.82		16-Apr	155.12	152.85		16-Jul	155.49	152.53		16-Oct	155.26	152.31	
30-Jan	155.24	152.82		17-Apr	155.13	152.85		17-Jul	155.48	152.53		17-Oct	155.26	152.30	
31-Jan	155.24	152.82		18-Apr	155.14	152.85		18-Jul	155.47	152.51		18-Oct	155.26	152.30	
1-Feb	155.23	152.82		19-Apr	155.14	152.85		19-Jul	155.46	152.50		19-Oct	155.26	152.30	
2-Feb	155.22	152.82		20-Apr	155.14	152.85		20-Jul	155.46	152.49	156.09	20-Oct	155.25	152.29	
3-Feb	155.21	152.82		21-Apr	155.14	152.85		21-Jul	155.45	152.47		21-Oct	155.26	152.29	
4-Feb	155.20	152.82		22-Apr	155.13	152.85		22-Jul	155.44	152.45		22-Oct	155.26	152.28	
5-Feb	155.19	152.82		23-Apr	155.13	152.85		23-Jul	155.44	152.43		23-Oct	155.25	152.27	
6-Feb	155.18	152.82		24-Apr	155.12	152.85		24-Jul	155.43	152.41		24-Oct	155.25	152.26	
7-Feb	155.18	152.82		25-Apr	155.12	152.85		25-Jul	155.44	152.39		25-Oct	155.25	152.26	
8-Feb	155.17	152.82		26-Apr	155.12	152.86		26-Jul	155.43	152.38		26-Oct	155.25	152.26	
9-Feb	155.17	152.82		27-Apr	155.13	152.87		27-Jul	155.43	152.37		27-Oct	155.24	152.25	
10-Feb	155.16	152.82		28-Apr	155.13	152.87		28-Jul	155.42	152.36	156.04	28-Oct	155.24	152.25	
11-Feb	155.15	152.82		29-Apr	155.14	152.88		29-Jul	155.42	152.35		29-Oct	155.23	152.24	
12-Feb	155.16	152.82		30-Apr	155.14	152.88		30-Jul	155.41	152.34		30-Oct	155.23	152.23	
13-Feb	155.17	152.82		1-May	155.14	152.88		31-Jul	155.40	152.33		31-Oct	155.23	152.23	
14-Feb	155.19	152.82		2-May	155.12	152.87		1-Aug	155.40	152.32		1-Nov	155.22	152.22	
15-Feb	155.20	152.82		3-May	155.12	152.88		2-Aug	155.39	152.31		2-Nov	155.22	152.22	
16-Feb	155.21	152.82		4-May	155.12	152.88		3-Aug	155.38	152.30		3-Nov	155.21	152.21	
17-Feb	155.22	152.82		5-May	155.11	152.88		4-Aug	155.37	152.28	156.02	4-Nov	155.21	152.22	
18-Feb	155.22	152.82		6-May	155.10	152.88		5-Aug	155.36	152.27		5-Nov	155.20	152.21	
19-Feb	155.22	152.82		7-May	155.09	152.87		6-Aug	155.35	152.26		6-Nov	155.20	152.21	
20-Feb	155.22	152.82		8-May	155.09	152.87		7-Aug	155.35	152.25		7-Nov	155.20	152.21	
21-Feb	155.23	152.82		9-May	155.10	152.88		8-Aug	155.35	152.24		8-Nov	155.20	152.21	
22-Feb	155.23	152.82		10-May	155.10	152.88		9-Aug	155.34	152.23	155.99	9-Nov	155.21	152.21	
23-Feb	155.23	152.82		11-May	155.10	152.87		10-Aug	155.33	152.23		10-Nov	155.21	152.21	
24-Feb	155.22	152.82		12-May	155.10	152.87		11-Aug	155.33	152.22		11-Nov	155.20	152.21	
25-Feb	155.21	152.82		13-May	155.11	152.88		12-Aug	155.32	152.22		12-Nov	155.20	152.21	
26-Feb	155.20	152.82		14-May	155.10	152.87		13-Aug	155.32	152.21		13-Nov	155.20	152.21	
27-Feb	155.20	152.82		15-May	155.11	152.87		14-Aug	155.32	152.21		14-Nov	155.20	152.21	
28-Feb	155.19	152.82		16-May	155.10	152.87		15-Aug	155.32	152.21		15-Nov	155.19	152.21	
29-Feb	155.19	152.82		17-May	155.10	152.87		16-Aug	155.32	152.21	155.98	16-Nov	155.20	152.21	
1-Mar	155.20	152.82		18-May	155.09	152.87		17-Aug	155.32	152.21		17-Nov	155.20	152.21	
2-Mar	155.21	152.82		19-May	155.08	152.87		18-Aug	155.31	152.21		18-Nov	155.19	152.21	
3-Mar	155.21	152.82		20-May	155.08	152.88		19-Aug	155.30	152.21		19-Nov	155.19	152.21	
4-Mar	155.22	152.82		21-May	155.07	152.88		20-Aug	155.32	152.23		20-Nov	155.19	152.21	
5-Mar	155.22	152.83		22-May	155.06	152.87		21-Aug	155.32	152.24		21-Nov	155.19	152.22	
6-Mar	155.22	152.82		23-May	155.06	152.89		22-Aug	155.31	152.24		22-Nov	155.19	152.22	
7-Mar	155.22	152.82		24-May	155.06	152.91		23-Aug	155.31	152.24		23-Nov	155.19	152.22	
8-Mar	155.22	152.82		25-May	155.05	152.93		24-Aug	155.31	152.25	155.89	24-Nov	155.19	152.22	
9-Mar	155.21	152.82		26-May	155.04	152.94		25-Aug	155.31	152.26		25-Nov	155.19	152.22	155.81
10-Mar	155.21	152.82		27-May	155.04	152.96		26-Aug	155.30	152.26		26-Nov	155.20	152.22	
11-Mar	155.20	152.82		28-May	155.03	152.97		27-Aug	155.29	152.27		27-Nov	155.20	152.22	
12-Mar	155.19	152.82		29-May	155.03	152.98		28-Aug	155.29	152.27		28-Nov	155.20	152.22	
13-Mar	155.19	152.82		30-May	155.05	152.98		29-Aug	155.29	152.28		29-Nov	155.20	152.22	
14-Mar	155.18	152.82		31-May	155.06	152.98		30-Aug	155.28	152.29		30-Nov	155.21	152.23	
15-Mar	155.18	152.83		1-Jun	155.07	152.97		31-Aug	155.29	152.30		1-Dec	155.21	152.23	
16-Mar	155.18	152.83		2-Jun	155.08	152.98		1-Sep	155.33	152.35		2-Dec	155.21	152.23	

Date	Whale Tail South (masl)	Mammoth Lake (masl.)	Nemo Lake	Date	Whale Tail South (masl)	Mammoth Lake (masl.)	Nemo Lake	Date	Whale Tail South (masl)	Mammoth Lake (masl.)	Nemo Lake	Date	Whale Tail South (masl)	Mammoth Lake (masl.)	Nemo Lake
Code Identification	**WTS-Survey**	**MAM-Survey**	**NEMO-Survey**	**Code Identification**	**WTS-Survey**	**MAM-Survey**	**NEMO-Survey**	**Code Identification**	**WTS-Survey**	**MAM-Survey**	**NEMO-Survey**	**Code Identification**	**WTS-Survey**	**MAM-Survey**	**NEMO-Survey**
17-Mar	155.18	152.83		3-Jun	155.08	152.98		2-Sep	155.35	152.38		3-Dec	155.21	152.23	
18-Mar	155.19	152.83		4-Jun	155.09	152.97		3-Sep	155.35	152.41		4-Dec	155.21	152.23	
19-Mar	155.19	152.82		5-Jun	155.09	152.97		4-Sep	155.36	152.43		5-Dec	155.20	152.23	
20-Mar	155.20	152.82		6-Jun	155.11	152.97		5-Sep	155.36	152.45		6-Dec	155.21	152.24	
21-Mar	155.21	152.83		7-Jun	155.15	152.96		6-Sep	155.36	152.46		7-Dec	155.21	152.24	
22-Mar	155.21	152.83		8-Jun	155.21	152.94		7-Sep	155.36	152.47		8-Dec	155.22	152.24	
23-Mar	155.20	152.83		9-Jun	155.27	152.92		8-Sep	155.37	152.48	155.90	9-Dec	155.23	152.24	
24-Mar	155.19	152.83		10-Jun	155.34	152.90		9-Sep	155.36	152.48		10-Dec	155.22	152.24	
25-Mar	155.18	152.83		11-Jun	155.40	152.87		10-Sep	155.35	152.48		11-Dec	155.22	152.23	
26-Mar	155.18	152.83		12-Jun	155.48	152.84		11-Sep	155.35	152.48		12-Dec	155.22	152.23	
27-Mar	155.17	152.83		13-Jun	155.58	152.80		12-Sep	155.35	152.48	155.89	13-Dec	155.22	152.23	
28-Mar	155.16	152.83		14-Jun	155.64	152.78		13-Sep	155.35	152.48		14-Dec	155.21	152.23	
29-Mar	155.16	152.83		15-Jun	155.71	152.76		14-Sep	155.36	152.48		15-Dec	155.21	152.23	
30-Mar	155.15	152.83		16-Jun	155.74	152.74		15-Sep	155.35	152.48		16-Dec	155.20	152.23	
31-Mar	155.16	152.83		17-Jun	155.76	152.75		16-Sep	155.33	152.48		17-Dec	155.19	152.23	
				18-Jun	155.66	152.78		17-Sep	155.33	152.49		18-Dec	155.19	152.23	
				19-Jun	155.40	152.81		18-Sep	155.33	152.49		19-Dec	155.18	152.23	
				20-Jun	155.44	152.81		19-Sep	155.32	152.49		20-Dec	155.18	152.24	
				21-Jun	155.61	152.81		20-Sep	155.31	152.49	155.88	21-Dec	155.18	152.24	
				22-Jun	155.55	152.80		21-Sep	155.31	152.48		22-Dec	155.18	152.24	
				23-Jun	155.67	152.79		22-Sep	155.31	152.47		23-Dec	155.17	152.23	
				24-Jun	155.72	152.78		23-Sep	155.30	152.47		24-Dec	155.16	152.24	
				25-Jun	155.70	152.77		24-Sep	155.30	152.46		25-Dec	155.16	152.24	
				26-Jun	155.69	152.76		25-Sep	155.29	152.45		26-Dec	155.15	152.24	
				27-Jun	155.68	152.75		26-Sep	155.28	152.44		27-Dec	155.14	152.24	
				28-Jun	155.66	152.74		27-Sep	155.28	152.43		28-Dec	155.15	152.24	
				29-Jun	155.65	152.72		28-Sep	155.28	152.43		29-Dec	155.16	152.24	
				30-Jun	155.63	152.71		29-Sep	155.27	152.42		30-Dec	155.18	152.24	
								30-Sep	155.27	152.41	155.86	31-Dec	155.18	152.24	

Figure 8 Whale Tail 2020 Lake Water Level Monitoring

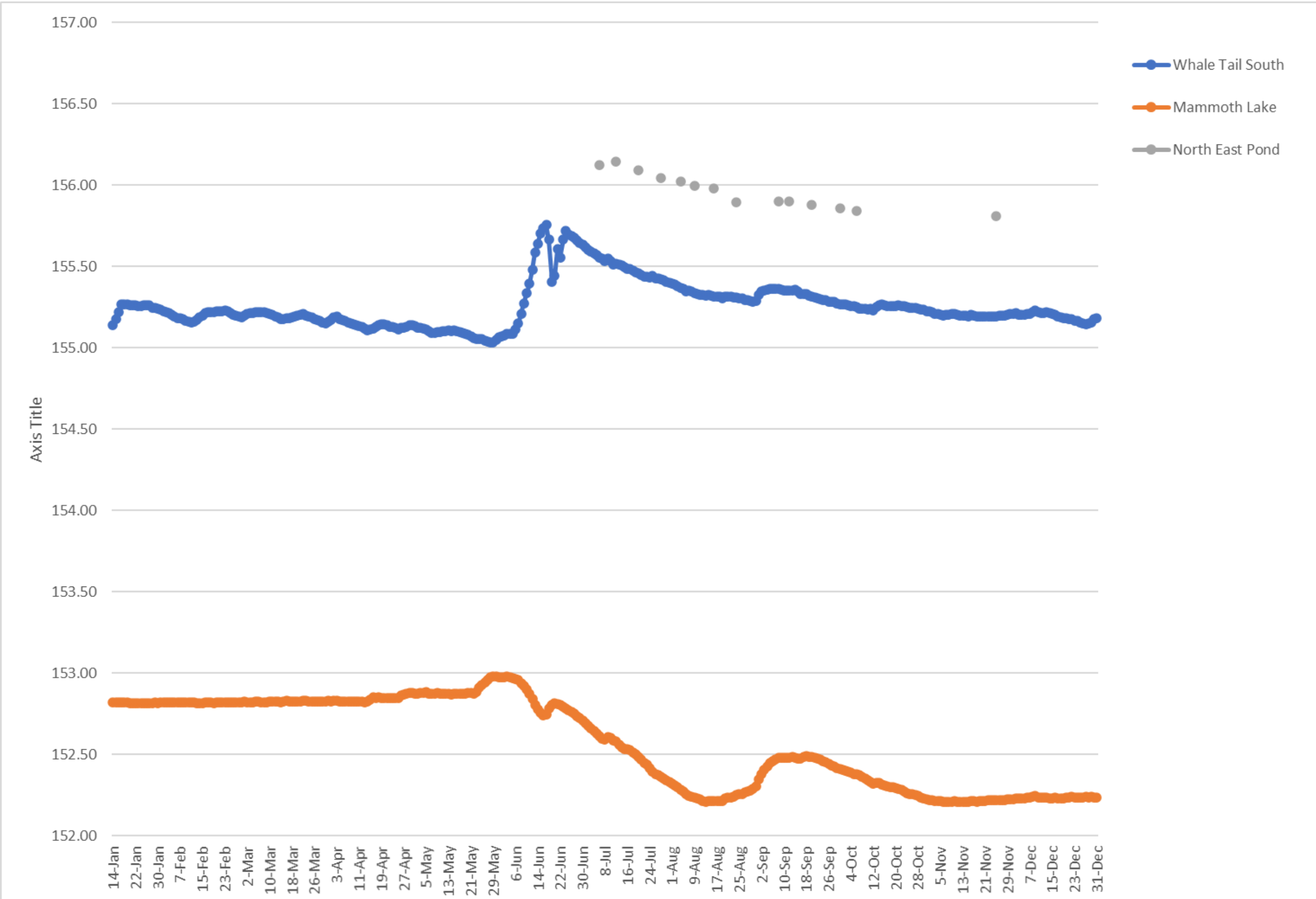


Table 4-6 Whale Tail 2018-2020 Lake Water Level Average

Date	Whale Tail Lake South Basin (masl)	Mammoth Lake (masl)	Nemo Lake (masl)
Code Identification	WTS-Survey	MAM-Survey	NEMO-Survey
2018	152.71	152.53	-
2019	154.85	152.49	156.16
2020	155.26	152.57	156.04

4.3 BATHYMETRIC SURVEYS BAKER LAKE MARSHALLING FACILITY

As required by NWB Water License 2AM-MEA1530 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 August 22nd, 2020 and is included in Appendix 19. 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-MEA1530 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 inspections on the dewatering dikes and tailings facility are performed every week and are documented during period of flow or 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 Engineer of Record.

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

Agnico also conducted weekly inspections for seepage sump and contact and non-contact water ditches and document the inspections. During freshet period, inspection frequency is increased as detailed in the Freshet Action Plan (Appendix D of the 2020 Water Management Report and Plan Version 9 (Appendix 11).

4.4.1.2 *Whale Tail Site*

As required by NWB Water License 2AM-WTP1830 Part E, Item 10: ***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.***

Agnico has an inspection program in place to inspect the water management infrastructures. Site inspections on the dewatering dikes are performed every week and are documented during period of flow or 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 Engineer of Record.

More information is presented in the Water Management Plan Version 6 (Appendix 12) and in the Water Management Infrastructures OMS manual.

Agnico also conducted weekly inspections for sumps and ditches on a weekly basis and documented the inspections. During freshet period, inspection frequency is increased as detailed in the Freshet Action Plan (Appendix D of the 2020 Water Management Plan Version 6 (Appendix 12).

4.4.2 Water Balance Water Quality Model Reporting Summary

4.4.2.1 *Meadowbank Site*

As required by NWB Water License 2AM-MEA1530 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-MEA1530 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 2020 was completed. The technical report 2020 Water Management Report and Plan is included in Appendix 11.

The 2020 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, including In-Pit Tailings Deposition.
- 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 2020 Water Management Plan, SNC, 2021) 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 2020 Water Management Plan, as it pertains to the activities within the current approved license for the Meadowbank mine.

In 2020, 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, including In-Pit Tailings Deposition;
- Optimized reclaim strategy to maximize reclaim while limiting infrastructure movement;
- Update mill throughput forecast based on the future addition of components in the mill;
- Seepage flow update;
- Water transfer flow update based on new in-pit deposition plan and reclaim strategy.

Revisions and modifications to the Water Balance are discussed in detail in the 2020 Water Management Report and Plan Version 9 (Appendix 11) and are summarized below:

- Freshwater pumped from Third Portage Lake was mainly used at the mill (average of 173,857 m^3/month in 2020) and the camp (average of 2,776 m^3/month in 2020);
- In 2020, a total of 1,368,060 m^3 was reused by the Mill. The fresh water utilization (Mill and Camp) will vary from 0.78 Mm^3 to 1.75 Mm^3 per year for 2020 to 2025, and will then decrease to 34,000 m^3 in 2026 once mill operation stops. This does not include pit flooding;
- The freshwater consumption at the process plant in 2020 is lower compared to 2019 due to improvements in the reclaim system. Freshwater consumption is forecast to drop significantly in subsequent years due to efforts to optimize the reclaim system;
- The Water Quality Forecast 2020 (SNC, 2021) 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, and the Portage, Goose, Vault and Phaser Pits. A review of the available water quality data measured in 2019 was undertaken. Treatment may be required for aluminium, arsenic, cadmium, chromium, copper, iron, lead, nickel, selenium, thallium, chloride, fluoride, sulphate, and total ammonia/total nitrogen equivalent, as the pit water quality may exceed CCME limits if the water is not treated, based on the completely mixed assumption. For the Vault area, ammonia and nitrate are the parameters of concern, but no actual or forecasted concentration exceeds the Type A Water License discharge requirements for this area.

The following recommendations are presented in the 2020 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 2021.
- Continue to update the deposition plans of the In-Pit Deposition areas and TSF 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 2021 In-Pit Deposition area and TSF 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.
- Implement 2020 Meadowbank Water Quality Forecasting (SNC, 2021) recommendations.

4.4.2.2 *Whale Tail Site*

As required by NWB Water License 2AM-WTP1830 Schedule B, Item 9: ***Summary of reporting results for the Water Balance and Water Quality model and any calibrations as required in Part E Items 5, 6, and 8.***

And

As required by NWB Water License 2AM-WTP1830 Part E, Item 5: ***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-WTP1830 Part E, Item 6: ***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.***

A water balance and water management report and plan update for 2020 was completed. The technical report 2020 Water Management Plan Version 6 is included in Appendix 12.

The 2020 Water Management Plan for the Whale Tail 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;
    - Attenuation pond strategy;
    - Mine pits layout; and
    - Rock storage 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 (Whale Tail Water Quality Forecasting Update, Golder, 2021) 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 2020 Water Management Plan, as it pertains to the activities within the current approved license for the Whale Tail mine.

In 2020, in addition to the changes in the LOM, revisions/modifications were made to the Water Balance for optimization purposes including:

- Fresh water consumption revision;
- Flooding sequence and volumes update to take into account the updated pit inflows; and
- Water transfer flow update based on new water management plan.

Revisions and modifications to the Water Balance are discussed in detail in the 2020 Water Management Plan Version 6 (Appendix 12) and is summarized below:

- In 2020 additional water management system components were put in place at the Whale Tail mine in order to adapt effectively to the site conditions and to manage non contact water adequately.
- The Water Quality Forecast 2020 provides water quality modelling with updated parameters (including dissolved) to determine the need for potential treatment at closure. A review of the available water quality data measured in 2020 was undertaken. At closure and post-closure, flooded pit water quality is predicted to meet receiving water quality criteria when flooding is complete, allowing reconnection with the downstream receiving environment. Arsenic release from the submerged Whale Tail Pit walls is anticipated once pit-flooding commences, but is expected to be a relatively short-lived source to the flooded pit lake.

The following recommendations are made 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 2021.
- Conduct the water quality modelling analysis on a yearly basis based on updated water quality results and water balance through the life of mine.
- Implement 2020 Whale Tail Water Quality Forecasting (Golder, 2021) recommendations.

4.4.3 Predicted Vs Measured Water Quality

4.4.3.1 *Meadowbank Site*

As required by NWB Water License 2AM-MEA1530 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-MEA1530 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. Since 2017, 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 from 2012 to 2020. 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 20 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 2020, and from 2012 to 2019. The information is summarized in Figure 9 below.

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

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

Water Quantity

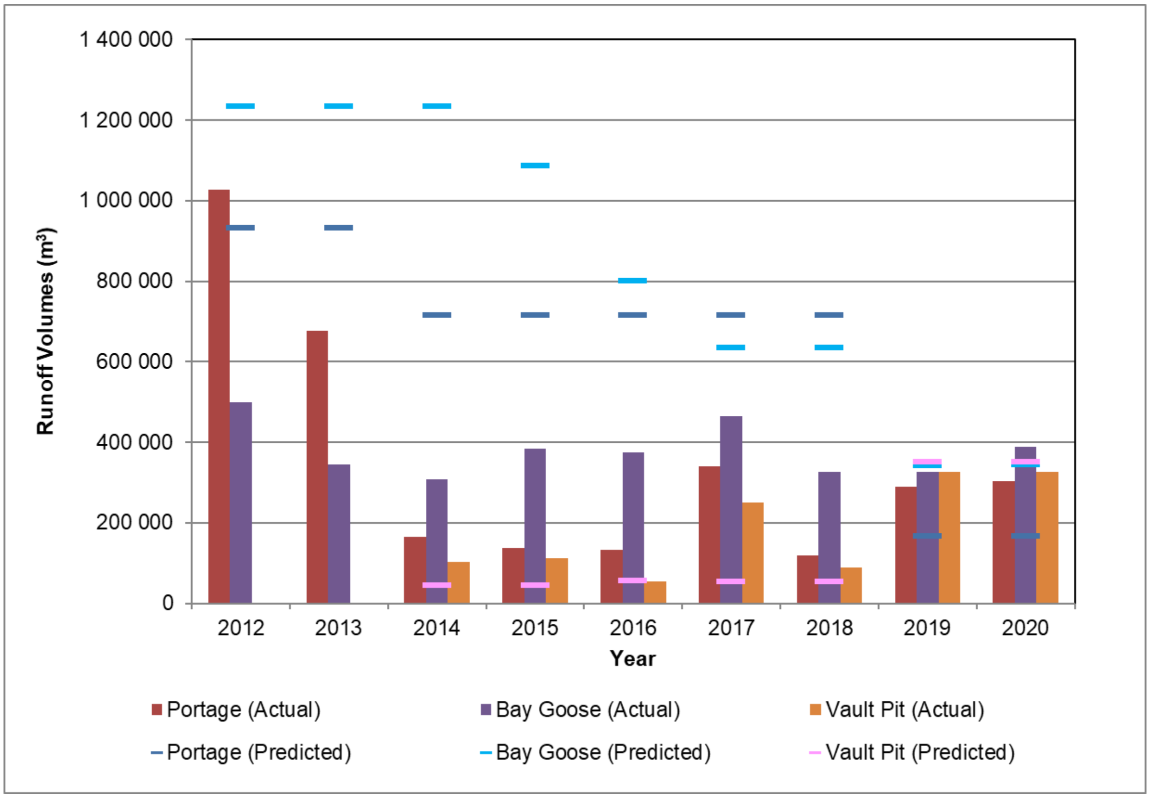
For Portage Pit, as presented in Appendix 20, the % difference between water volume predicted in Golder (2007) and water volume measured were less than predicted by more than 20% from 2013 to 2018. For 2012, the volume was slightly higher than predicted (+10%). This indicates that the seepage and groundwater sources and volumes predicted that collectively make up the water in the pits from 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. As of 2019, the % difference between water volume predicted in the Meadowbank Interim Closure and Reclamation Plan (ICRP), updated in 2019 and water volume measured was more than predicted by more than 20 % for 2019. More precisely, the measured water volume in 2019 in Portage Pit is 73 % higher than the predicted water volume. This can be explained in part by the higher precipitation observed in 2019 at the site and the transfer of the runoff volumes toward Portage Pit. In 2020, the % difference between the predicted and measured water value is 80 %. This can be explained in part by higher anticipated runoff volume and higher fresh water consumption at the mill since in 2020, reclaim water was transferred from North Portage Pit to the mill for re-use. The pumping system was undergoing commissioning and consequently less reclaim water was pumped back to the mill than planned. In 2021, the pumping system shall be undergoing further optimization and improvement to maximize reclaim water use at the mill.

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. The % difference between water volume predicted in the Meadowbank ICRP updated in 2019 and water volume measured in Goose Pit was not significant in 2019 (i.e. -5%). In 2020, the measured volume was higher than the predicted value by 13%.

For Vault Pit, the % differences 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 translated to a higher consumption of diesel fuel to operate the pumps. In 2019 and 2020, there was no significant difference between the predicted and measured volume (i.e. -7%).

The following figure summarizes the runoff to the different pits measured from 2012 to 2020 and compares them against the forecasted values.

Figure 9 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 2020 are summarized in Appendix 20. 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 Pits (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. For year 2012 to 2018, the predicted values were evaluated in the water quality prediction model developed in 2007. As of 2019, the predicted values for Portage and Goose pits were based on the water quality forecast considered in the Meadowbank Interim Closure and Reclamation Plan, updated in 2019 since in-pit deposition has started in Goose Pit. In addition, as of 2019, the measured values were also compared to the predicted values obtained in the water quality prediction model developed in 2007 to ensure continuity with previous years analysis.

Furthermore, the measured data was also compared to the Water License discharge criteria to Third Portage Lake and Wally Lake, the Metal and Diamond Mining Effluent Regulations (MDMER) and the CCME water quality guidelines for the protection of aquatic life. Sulphate concentrations were compared 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 laboratory services selected by Agnico are conducted by accredited facilities and reach the analysis lower detection limits (LDL) 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.

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. 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%). 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 MMER 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 MMER 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 MMER 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 MMER 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 MMER 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 MMER 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 MMER 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 MMER 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 MMER 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 MMER and Water License criteria.
  - Sulphate concentration was higher than the threshold value.

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

- For Vault Pit:
  - o 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.
  - o 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 MMER and Water License criteria.
  - o Sulphate concentration was higher than the threshold value.
- For Goose Pit:
  - o 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).
  - o The following measured parameters were found to be higher than the CCME guidelines: fluoride, nickel and nitrate. No parameters exceeded the MMER and Water Licence criteria.
- For Third Portage Pit:
  - o 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.
  - o 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 MMER and Water License criteria.
  - o Sulphate concentration was higher than the threshold value.
- For North Portage Pit:
  - o 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 MMER 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 MMER 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 MMER 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 MMER 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 MMER 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.
  - During re-flooding of Vault Pit, no treatment is expected to be required because the pit will be flooded with natural runoff and with water coming from the Wally Lake. With a significant inflow volume of clean water, the parameters that exceed CCME guidelines will be attenuated. Water quality will be monitored during pit re-flooding and the dike will only be breached if the water quality meets the final closure discharge criteria.
- 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.

In 2019 (year 10 of the Life of Mine):

- For Vault Pit:
  - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor End scenarios of year 7) versus the mean of measured values in Vault Pit were found for all of the parameters except for pH (0% for both scenarios), dissolved barium (-11% for Possible Poor End scenario), for dissolved Iron (+4% for Possible Poor End scenario) and for dissolved zinc (-3% for Possible Poor End scenario). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios of year 7), except for pH (0% for both scenarios), for dissolved copper (+8% for Possible Poor End scenario), for dissolved barium (-17% for Possible Poor End scenario) and for dissolved Iron (+4% for Possible Poor End scenario).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.03 mg/L vs CCME guideline of 0.016 mg/L), dissolved copper (mean value 0.0023 mg/L vs CCME guideline of 0.002 mg/L), fluoride (mean value of 0.17 mg/L vs CCME guideline of 0.12 mg/L) and nitrate (mean value of 7.45 mg/L vs CCME guideline of 2.74 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 of year 7) versus the mean of measured values in Phaser Pit were found for all of the parameters except for pH (-6% for both scenarios) and total dissolved solids (-17% for Possible Poor End scenario). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios of year 7), except for pH (-11% for both scenarios), dissolved iron (+4% for Possible Poor End scenario) and total dissolved solids (-18% for Possible Poor End scenario).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.028 mg/L vs CCME guideline of 0.016 mg/L), dissolved copper (mean value of 0.0045 vs CCME guideline of 0.002 mg/L), fluoride (mean value of 0.13 mg/L vs CCME guideline of 0.12 mg/L) and nitrate (mean value of 3.3 mg/L vs CCME guideline of 2.94 mg/L). No parameters exceeded the MDMER and Water Licence criteria.
  - Sulphate concentration was below the threshold value.

- For Goose Pit:
  - Comparison Based on In-Pit Deposition Water Quality Model (Interim Closure and Reclamation Plan, 2019):
    - The mean water quality concentrations measured in the Goose Pit Lake exceeded +/-20% predicted concentrations for Annual Average and Lower 25th centile scenarios of year 10 for all the parameters except for alkalinity (-16% for Annual Average and -15% for Lower 25th centile scenarios), fluoride (-14% for Annual Average and -12% for Lower 25th centile scenarios) and dissolved nickel (-2% for Annual Average and 0% for Lower 25th centile scenarios). 25th percentile couldn't be calculated due to insufficient data (less than 3 measurements). Note that the measured values were generally lower than the forecasted values.
  - Comparison Based on Initial Model, Year 3 (Golder, 2007):
    - The mean water quality concentrations measured in the Goose Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor scenarios of year 3 for all the parameters except for dissolved barium (+12 % for both Probable and Possible Poor scenarios) and total dissolved solids (+20 % for both Probable and Possible Poor scenarios). 25th percentile couldn't be calculated due to insufficient data (less than 3 measurements).
    - The measured values in Goose Pit are generally higher than the prediction of year 3. This can be explained by the in-pit deposition in Goose Pit that started in 2019 that added contaminants into water accumulated into the pit.
  - The following measured parameters were found to be higher than the CCME guidelines: unionized ammonia (mean value of 0.032 mg/L vs CCME guideline of 0.016 mg/L), ammonia nitrogen (mean value of 10.5 mg/L vs CCME guideline of 1.83 mg/L), dissolved arsenic (mean value of 0.0146 mg/L vs CCME guideline of 0.005 mg/L), dissolved copper (mean value of 0.354 mg/L vs CCME guideline of 0.002 mg/L), fluoride (mean value of 0.54 mg/L vs CCME guideline of 0.12 mg/L), dissolved molybdenum (mean value of 0.1025 mg/L vs CCME guideline of 0.073 mg/L), dissolved selenium (mean value of 0.0015 mg/L vs CCME guideline of 0.001 mg/L). Dissolved copper was higher than MDMER criteria (mean value of 0.354 mg/L vs MDMER criteria of 0.3 mg/L) and higher than Water Licence criteria (mean value of 0.354 mg/L vs Water Licence criteria of 0.1 mg/L).
  - Sulphate concentration was higher than the threshold value.
- For Third Portage Pit:
  - Comparison Based on In-Pit Deposition Water Quality Model (Interim Closure and Reclamation Plan, 2019):
    - The mean water quality concentrations measured in the Third Portage Pit sump exceeded +/-20% predicted concentrations for Annual Average and Lower 25th centile scenarios of year 10 for all the parameters, except for ammonia nitrogen (+20% for Lower 25th centile scenario), chloride (-3% for Lower 25th centile scenario), nitrate (+2% for Annual Average scenario), sulphate (-5% for Lower 25th centile scenario) and total dissolved solids (-18% for Lower 25th centile). For the

lower 25th percentile, all parameters measured exceeded the predicted (Average Annual and Lower 25th centile scenarios of year 10), except for chloride (-14% for Lower 25th centile scenario), nitrate (-8% for Lower 25th centile scenario) and sulphate (-4% for Lower 25th centile scenario). Note that the measured values were generally lower than the forecasted values.

- o Comparison Based on Initial Model, Year 4 (Golder, 2007):
    - ▪ The mean water quality concentrations measured in the Third Portage Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor scenarios of year 4 for all the parameters, except for dissolved arsenic (+1% for Probable scenario), hardness (-7% for Probable and -10% Possible Poor scenarios), dissolved mercury (-15% for Probable scenario) and dissolved thallium (-17% for Possible Poor scenario). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor scenarios of year 4), except for alkalinity (+15% for Probable and +7% for Possible Poor scenarios), ammonia nitrogen (+16% for Probable scenario), dissolved arsenic (-17% for Probable scenario), hardness (-7% for Probable and -10% for Possible Poor scenarios), dissolved mercury (-15% for Probable scenario), dissolved selenium (-14% for Probable scenario) and dissolved thallium (-17% for Possible Poor scenario).
    - ▪ The measured value of ammonia (unionized) is significantly higher than the prediction of year 4.
- o The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.11 mg/L vs CCME guideline of 0.016 mg/L), ammonia nitrogen (mean value of 5.44 mg/L vs CCME guideline of 1.83 mg/L), fluoride (mean value of 0.39 mg/L vs CCME guideline of 0.12 mg/L) and nitrate (mean value 10.6 mg/L vs CCME guideline of 2.94 mg/L). No parameters exceeded the MDMER and Water License criteria.
- o Sulphate concentration was higher than the threshold value.
- o It is important to note that pH and unionized ammonia were not forecasted for year 10.

- For North Portage Pit:
    - o Comparison Based on In-Pit Deposition Water Quality Model (Interim Closure and Reclamation Plan, 2019):
        - ▪ The mean water quality concentrations measured in the North Portage Pit sump exceeded +/-20% predicted concentrations for Annual Average and Lower 25th centile scenarios of year 10 for all the parameters except for fluoride (-7% for Annual Average and +15% for Lower 25th centile scenarios), dissolved barium (-14% for Annual Average and +4% for Lower 25th centile scenarios), dissolved cadmium (+4% for Annual Average scenario), dissolved molybdenum (-14% for Annual Average and +5% for Lower 25th centile scenarios) and total dissolved solids (+1% for Annual Average and +12% Lower 25th centile scenarios). 25th percentile couldn't be calculated due to insufficient data (less than 3 measurements).

- Comparison Based on Initial Model, Year 4 (Golder, 2007):
    - The mean water quality concentrations measured in the North Portage Pit exceeded +/-20% predicted concentrations for Probable and Possible Poor scenarios of year 4 for all the parameters except for dissolved cadmium (+11 % for Possible Poor scenario). 25th percentile couldn't be calculated due to insufficient data (less than 3 measurements).
    - The measured values in North Portage Pit are generally higher than the prediction of year 4. This can be explained by the transferred reclaim water from Central Downstream Pond to North Portage Pit that added contaminants into the pit water.
- The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.105 mg/L vs CCME guideline of 0.016 mg/L), ammonia nitrogen (mean value of 6.7 mg/L vs CCME guideline of 1.83 mg/L), dissolved arsenic (mean value of 0.2721 mg/L vs CCME guideline of 0.005 mg/L), chloride (mean value of 162 mg/L vs CCME guideline of 120 mg/L), dissolved copper (mean value of 0.0249 mg/L vs CCME guideline of 0.002 mg/L), fluoride (mean value of 0.38 mg/L vs CCME guideline of 0.12 mg/L), dissolved nickel (mean value 0.0640 mg/L vs CCME guideline of 0.025 mg/L), dissolved cadmium (mean value of 0.0001 mg/L vs CCME guideline of 0.00004 mg/L), dissolved molybdenum (mean value of 0.1533 mg/L vs CCME guideline of 0.073 mg/L). dissolved selenium (mean value of 0.0075 mg/L vs CCME guideline of 0.001 mg/L) and nitrate (mean value of 4.59 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.
- It is important to note that pH and unionized ammonia were not forecasted for year 10.

In 2020 (year 11 of the Life of Mine):

- For Vault Pit:
    - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor End scenarios of year 7) versus the mean of measured values in Vault Pit were found for all the parameters except for pH (0% for both scenarios), dissolved selenium (-17% for Possible Poor End scenario) and for dissolved zinc (-17% for Possible Poor End scenario). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios of year 7), except for pH (-1% for both scenarios) and for dissolved zinc (-17% for Possible Poor End scenario).
    - The following measured parameters were found to be higher than the CCME guidelines: dissolved selenium (mean value 0.0011 mg/L vs CCME guideline of 0.001 mg/L). No parameters exceeded the MDMER and Water Licence criteria.
    - The Vault Pit is undergoing natural reflooding in 2020. There is an observable improvement in water quality in 2020 compared to 2019 measurements.

- For Phaser Pit:
    - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor End scenarios of year 7) versus the mean of measured values in Phaser Pit were found for all of the parameters except for pH (-3% for both scenarios), dissolved copper (-1% for Possible Poor End Scenario), dissolved zinc (+10% for Probable End Scenario) and total dissolved solids (-17% for Possible Poor End scenario). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios of year 7), except for pH (-6% for both scenarios), sulphate (+10% for Possible Poor End scenario) and total dissolved solids (-17% for Possible Poor End scenario).
    - All measured parameters were found to be lower than the CCME guidelines. No parameters exceeded the MDMER and Water Licence criteria.
    - The Phaser Pit is undergoing natural reflooding in 2020. There is an observable improvement in water quality in 2020 compared to 2019 measurements.
- For Goose Pit:
    - Comparison Based on In-Pit Deposition Water Quality Model (Interim Closure and Reclamation Plan, 2020):
        - The mean water quality concentrations measured in the Goose Pit Lake exceeded +/-20% predicted concentrations for Annual Average and Lower 25th centile scenarios of year 11 for all the parameters except for dissolved lead (-7% for Lower 25th centile scenario), dissolved molybdenum (+12% for Annual Average scenario) and sulphate (+1% for Annual Average scenario).
        - The lower 25th percentile water quality measured in the Goose Pit Lake exceeded +/-20% predicted concentrations for Annual Average and Lower 25th centile scenarios of year 11 for all the parameters except for ammonia nitrogen (-7% for Annual Average scenario), dissolved copper (-2% for Lower 25th centile scenario), dissolved barium (+19% for Annual Average scenario), dissolved molybdenum (-17% for Annual Average scenario), dissolved selenium (-6% for Annual Average scenario) and total dissolved solids (+14% for Annual Average scenario).
    - Comparison Based on Initial Model, Year 3 (Golder, 2007):
        - The mean water quality concentrations measured in the Goose Pit Lake exceeded +/-20% predicted concentrations for Probable and Possible Poor scenarios of year 3 for all the parameters except for nitrate (-1% for both scenarios).
        - The lower 25th percentile water quality concentrations measured in Goose Pit Lake exceeded +/-20% predicted concentrations for Probable and Possible Poor scenarios of year 3 for all the parameters except for dissolved barium (+8% for both scenarios).
        - The measured values in Goose Pit are generally higher than the prediction of year 3. This can be explained by the in-pit deposition in Goose Pit that started in 2019 and ended in 2020 added contaminants into water accumulated into the pit.
    - The following measured parameters were found to be higher than the CCME guidelines:

- unionized ammonia (mean value of 0.59 mg/L vs CCME guideline of 0.016 mg/L)
- ammonia nitrogen (mean value of 19.2 mg/L vs CCME guideline of 1.83 mg/L)
- dissolved arsenic (mean value of 0.672 mg/L vs CCME guideline of 0.005 mg/L)
- chloride (mean value of 193 mg/L vs CCME guideline of 120 mg/L)
- dissolved copper (mean value of 0.587 mg/L vs CCME guideline of 0.002 mg/L)
- fluoride (mean value of 0.25 mg/L vs CCME guideline of 0.12 mg/L)
- dissolved nickel (mean value of 0.134 mg/L vs CCME guideline of 0.025 mg/L)
- dissolved molybdenum (mean value of 0.081 mg/L vs CCME guideline of 0.073 mg/L)
- dissolved selenium (mean value of 0.0326 mg/L vs CCME guideline of 0.001 mg/L)
- nitrate (mean value of 3.96 mg N/L vs CCME guideline 2.94 mg N/L)

o Dissolved arsenic and copper were higher than MDMER criteria (mean value of 0.6172 and 0.587 mg/L vs MDMER criteria of 0.5 and 0.3 mg/L respectively) and higher than Water Licence criteria (Water Licence criteria of 0.3 and 0.1 mg/L respectively). Also, ammonia nitrogen was higher than Water License criteria (mean value of 19 mg N/L vs 16 mg N/L). Note that the discharge criteria outlined in the MDMER and Water License are based on total concentrations and are used herein for compassion purposes only.

o Sulphate concentration was higher than the threshold value.

- For Third Portage Pit (Pit E):
  - o Comparison Based on In-Pit Deposition Water Quality Model (Interim Closure and Reclamation Plan, 2020):
    - The mean water quality concentrations measured in the Third Portage Pit sump exceeded +/-20% predicted concentrations for Annual Average and Lower 25th centile scenarios of year 11 for all the parameters, except for alkalinity (-1% for Lower 25th centile scenario), dissolved arsenic (-16% for Lower 25th centile scenario), chloride (+1% for Annual Average scenario), fluoride (-14% for Annual Average scenario), nitrate (+9% for Annual Average scenario) and sulphate (-6% for Lower 25th centile scenario).
    - For the lower 25th percentile, all parameters measured exceeded the predicted (Average Annual and Lower 25th centile scenarios of year 11), except for alkalinity (-3% for Lower 25th scenario), nitrate (-13% for Annual Average scenario) and sulphate (-14% for Lower 25th centile scenario).
    - The measured value dissolved selenium is much higher than model prediction.
  - o Comparison Based on Initial Model, Year 4 (Golder, 2007):

- The mean water quality concentrations measured in the Third Portage Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor scenarios of year 4 for all the parameters, except for dissolved barium (-5% for Probable Poor End scenario), dissolved mercury (+13% for Probable scenario) and dissolved thallium (-17% for Possible Poor scenario).
- For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor scenarios of year 4), except for dissolved barium (+7% for Probable scenario), dissolved mercury (-15% for Probable scenario), dissolved thallium (-17% for Possible Poor scenario) and nitrate (+5% for Possible Poor scenario).
- The measured value of ammonia (unionized), dissolved arsenic, dissolved copper and dissolved selenium is significantly higher than the prediction of year 4, which can be explained by the start of in-pit deposition in Pit E in 2020.

o The following measured parameters were found to be higher than the CCME guidelines:

- unionized ammonia (mean value of 0.49 mg/L vs CCME guideline of 0.016 mg/L)
- ammonia nitrogen (mean value of 15 mg/L vs CCME guideline of 1.83 mg/L)
- dissolved arsenic (mean value of 0.56 mg/L vs CCME guideline of 0.005 mg/L)
- chloride (mean value of 149 mg/L vs CCME guideline of 120 mg/L)
- dissolved copper (mean value of 0.17 mg/L vs CCME guideline of 0.002 mg/L)
- fluoride (mean value of 0.34 mg/L vs CCME guideline of 0.12 mg/L)
- dissolved nickel (mean value of 0.39 mg/L vs CCME guideline of 0.025 mg/L)
- dissolved manganese (mean value of 0.45 mg/L vs CCME guideline of 0.23 mg/L)
- dissolved molybdenum (mean value of 0.16 mg/L vs CCME guideline of 0.073 mg/L)
- dissolved selenium (mean value of 0.061 mg/L vs CCME guideline of 0.001 mg/L)
- nitrate (mean value of 401 mg N/L vs CCME guideline 2.94 mg N/L)

o Dissolved arsenic was higher than MDMER criteria (mean value of 0.56 mg/L vs MDMER criteria of 0.5) and higher than Water Licence criteria (Water Licence criteria of 0.3 mg/L). Also, dissolved copper and dissolved nickel were higher than Water License criteria (mean value of 0.17 and 0.39 mg/L vs water License criteria of 0.1 and 0.2 mg/L respectively). Note that the discharge criteria outlined in the MDMER and Water License are based on total concentrations and are used herein for compassion purposes only.

o Sulphate concentration was higher than the threshold value.

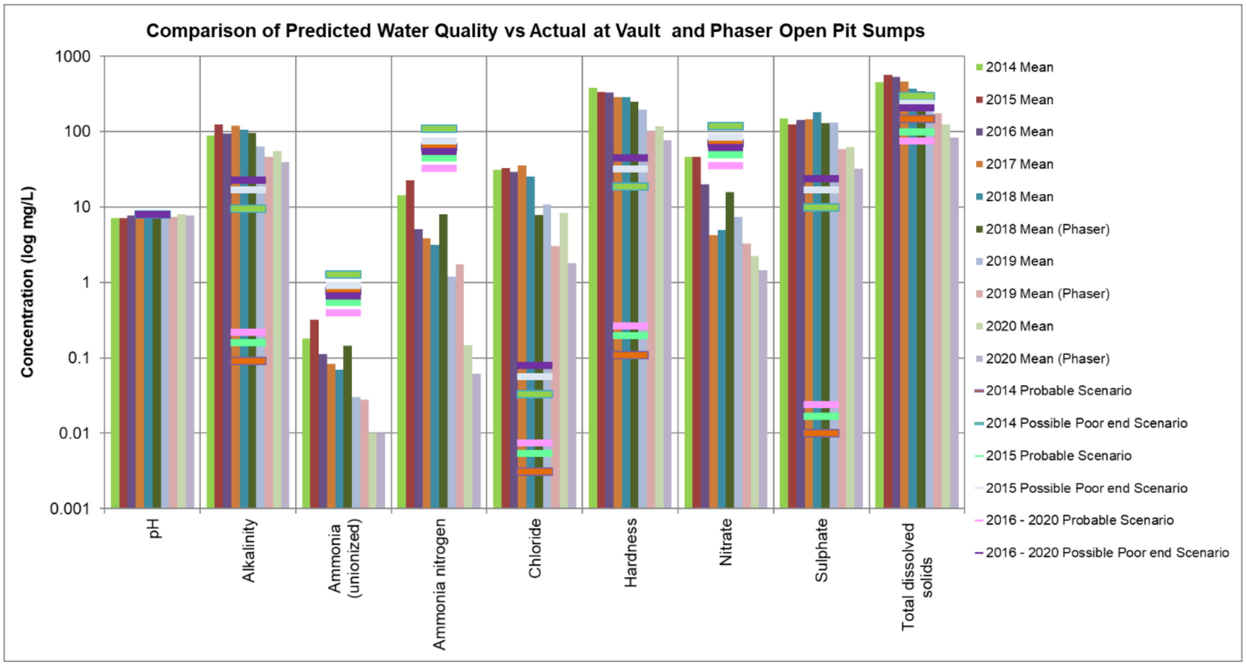
- For North Portage Pit (Pit A):
  - o Comparison Based on In-Pit Deposition Water Quality Model (Interim Closure and Reclamation Plan, 2020):
    - The mean water quality concentrations measured in the North Portage Pit sump exceeded +/-20% predicted concentrations for Annual Average and Lower 25th centile scenarios of year 11 for all the parameters except for chloride (+15% for Annual average scenario), hardness (+12% for Average Annual scenario and nitrate (-14% for Lower 25th centile scenario).
    - For the lower 25th percentile, all parameters measured exceeded the predicted (Average Annual and Lower 25th centile scenarios of year 11), except for alkalinity (-6% for Average annual and +9% for Lower 25th scenarios), dissolved barium (+13% for Lower 25th centile), dissolved manganese (+12% for Annual Average scenario) and nitrate (-18% for Lower 25th centile scenario).
    - The measured value dissolved nickel is much higher than model prediction.
  - o Comparison Based on Initial Model, Year 4 (Golder, 2007):
    - The mean water quality concentrations measured in the North Portage Pit exceeded +/-20% predicted concentrations for Probable and Possible Poor scenarios of year 4 for all the parameters except for ammonia nitrogen (+9% for Probable scenario) and dissolved manganese (-7 % for Possible Poor scenario).
    - For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor scenarios of year 4), except for ammonia nitrogen (+8% for Probable scenario).
    - The measured values in North Portage Pit are significantly higher than the prediction of year 4. This can be explained by the continued transfer of reclaim water from South Cell TSF, Central Downstream Pond and Goose Pit to North Portage Pit that added contaminants into the pit water.
  - o The following measured parameters were found to be higher than the CCME guidelines:
    - unionized ammonia (mean value of 0.31 mg/L vs CCME guideline of 0.016 mg/L)
    - ammonia nitrogen (mean value of 13 mg/L vs CCME guideline of 1.83 mg/L)
    - dissolved arsenic (mean value of 0.34 mg/L vs CCME guideline of 0.005 mg/L)
    - chloride (mean value of 124 mg/L vs CCME guideline of 120 mg/L)
    - dissolved copper (mean value of 0.33 mg/L vs CCME guideline of 0.002 mg/L)
    - fluoride (mean value of 0.25 mg/L vs CCME guideline of 0.12 mg/L)
    - dissolved nickel (mean value of 0.092 mg/L vs CCME guideline of 0.025 mg/L)
    - dissolved molybdenum (mean value of 0.090 mg/L vs CCME guideline of 0.073 mg/L)

    - dissolved selenium (mean value of 0.019 mg/L vs CCME guideline of 0.001 mg/L)

- Dissolved copper was higher than MDMER criteria (mean value of 0.33 mg/L vs MDMER criteria of 0.3) and higher than Water Licence criteria (Water Licence criteria of 0.3 mg/L). Also, dissolved arsenic and copper were higher than Water License criteria (mean value of 0.34 and 0.33 mg/L vs Water License criteria of 0.3 and 0.1 mg/L respectively). Note that the discharge criteria outlined in the MDMER and Water License are based on total concentrations and are used herein for compassion purposes only.
- Sulphate concentration was higher than the threshold value.

Figures 10 to 13 on the following pages illustrate the measured annual mean concentrations (represented by the vertical bars) and the probable and possible poor scenario, for years 2012 to 2020, or annual average and lower 25th centile scenarios for year 2020 (represented by horizontal lines). 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 10 Meadowbank Mean Annual Water Quality - Vault and Phaser Open Pit Sumps



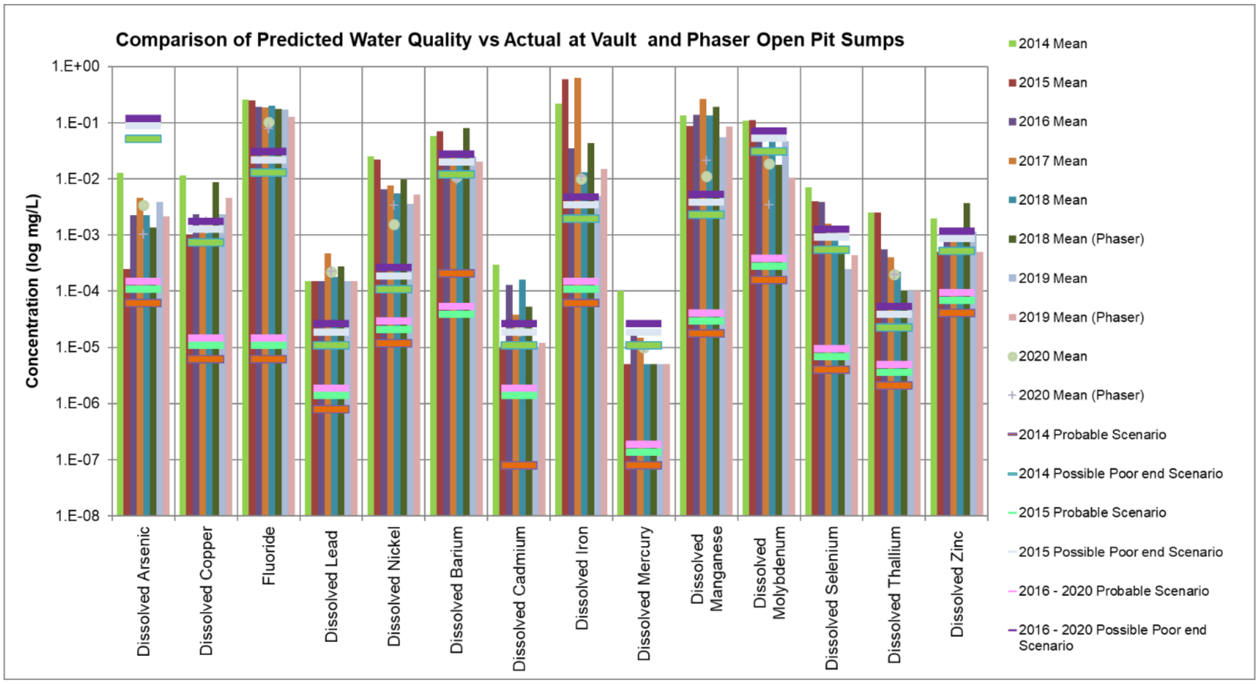
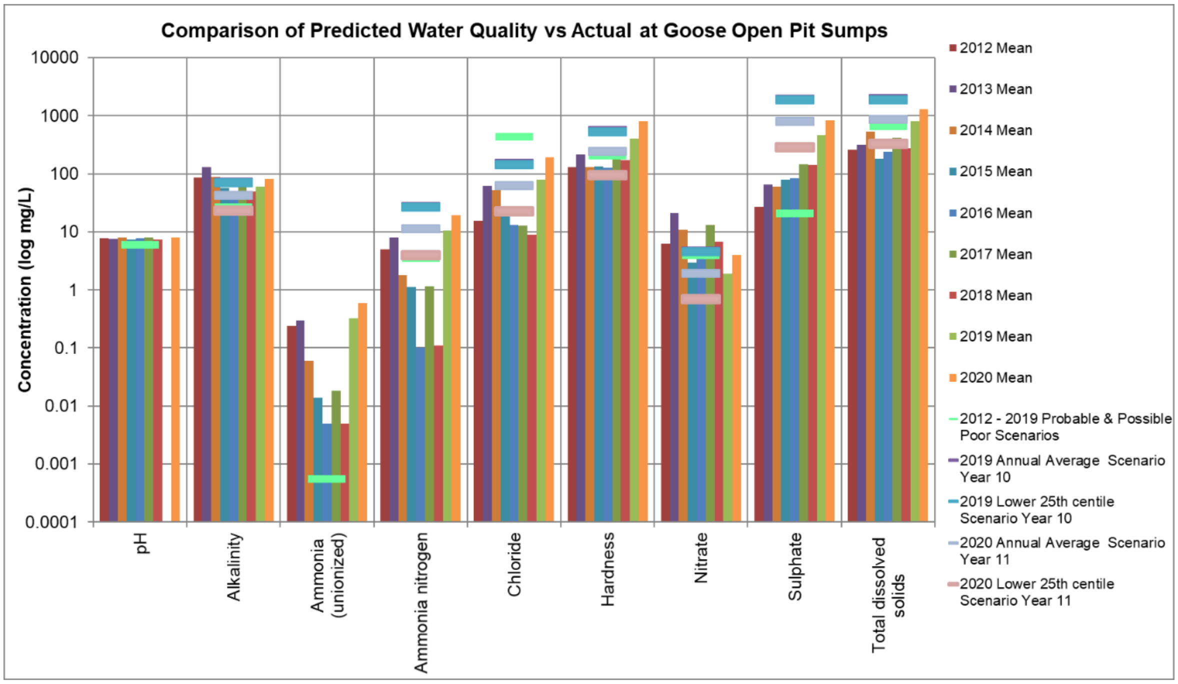


Figure 11 Meadowbank Mean Annual Water Quality – Goose Open Pit Sumps



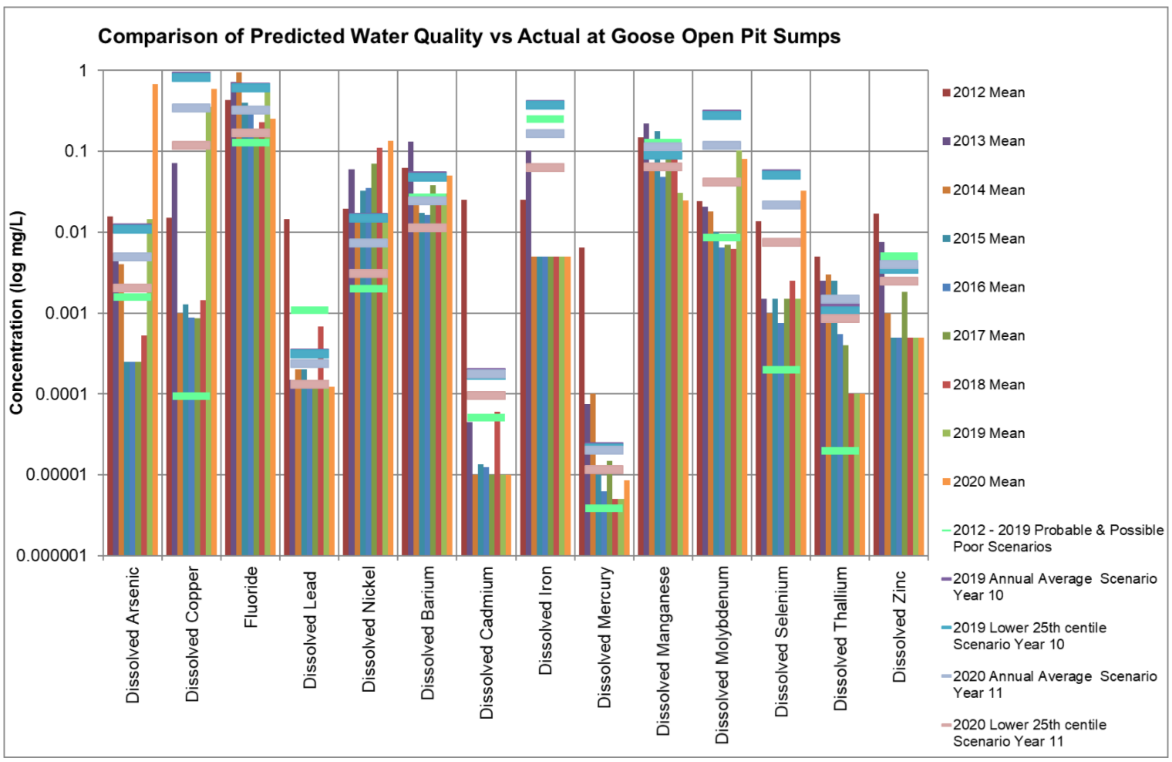
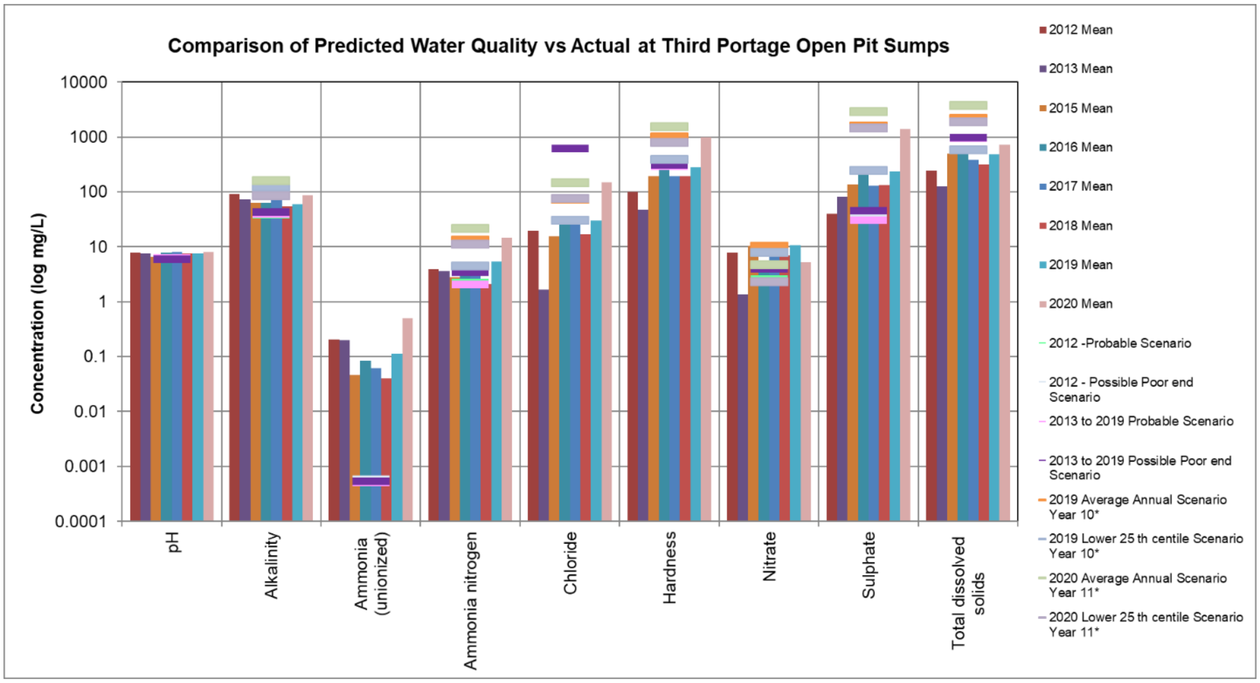


Figure 12 Meadowbank Mean Annual Water Quality – Third Portage Pit (Pit E) Sumps



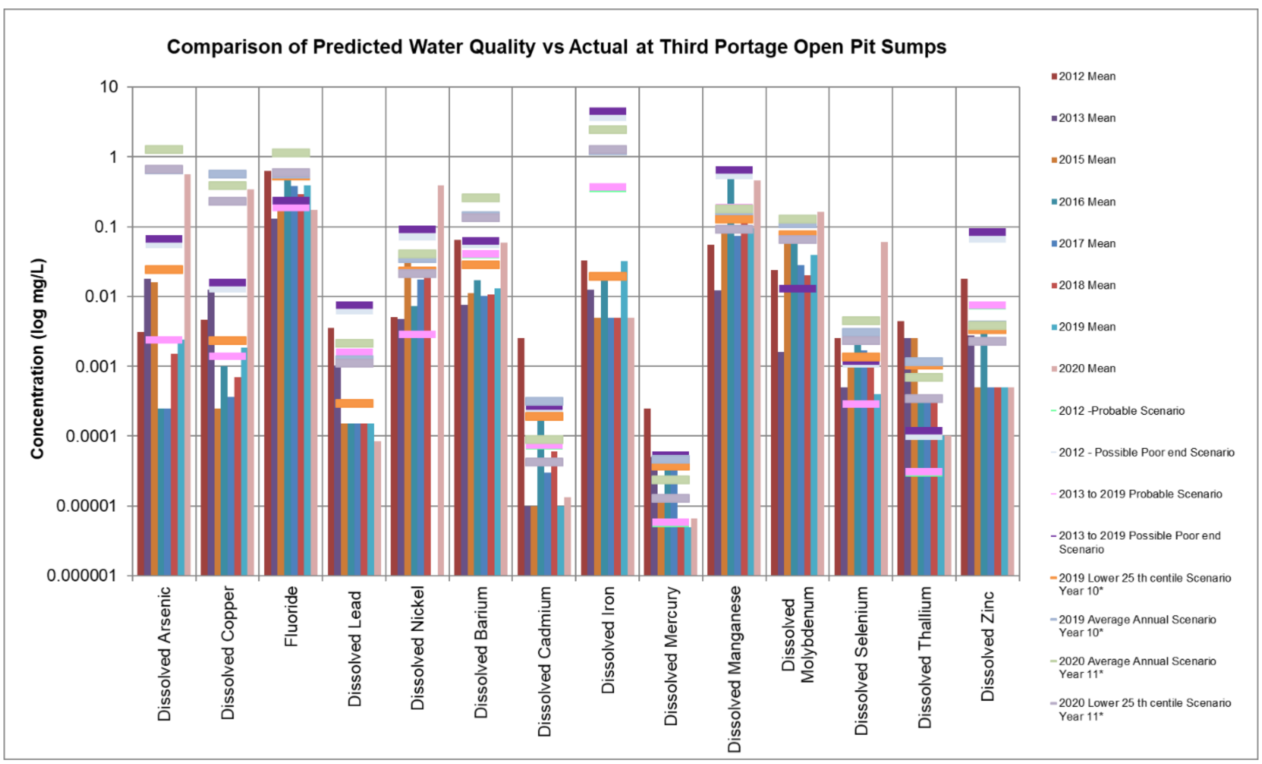
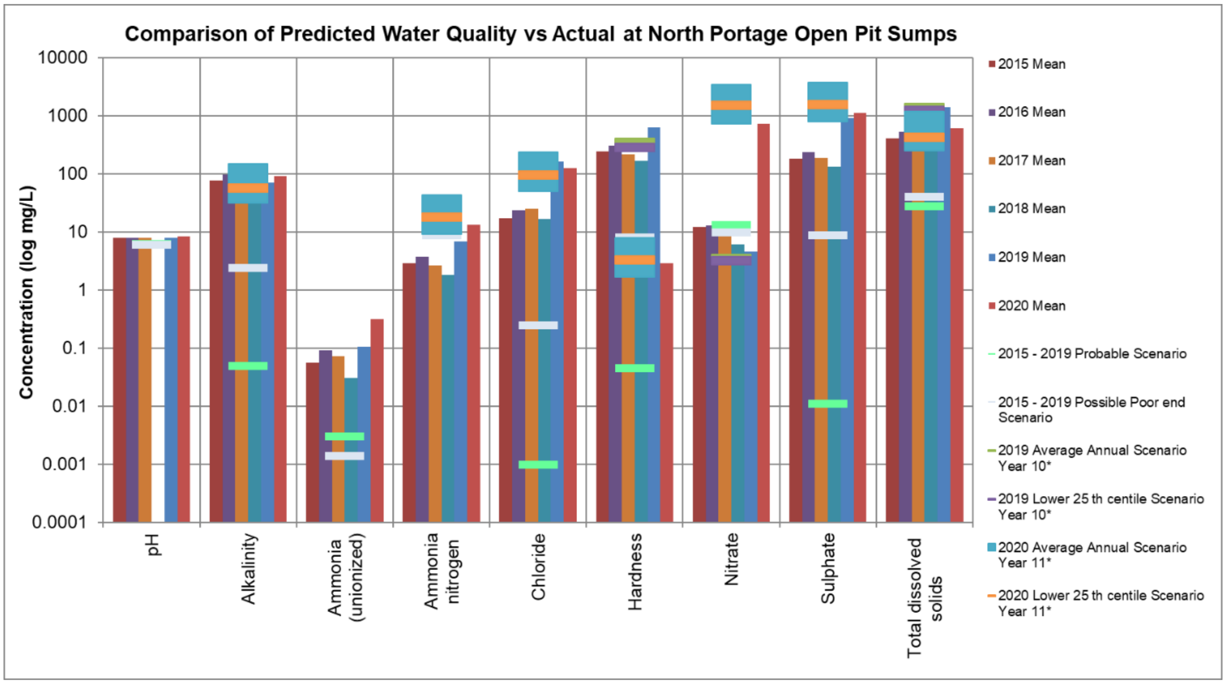
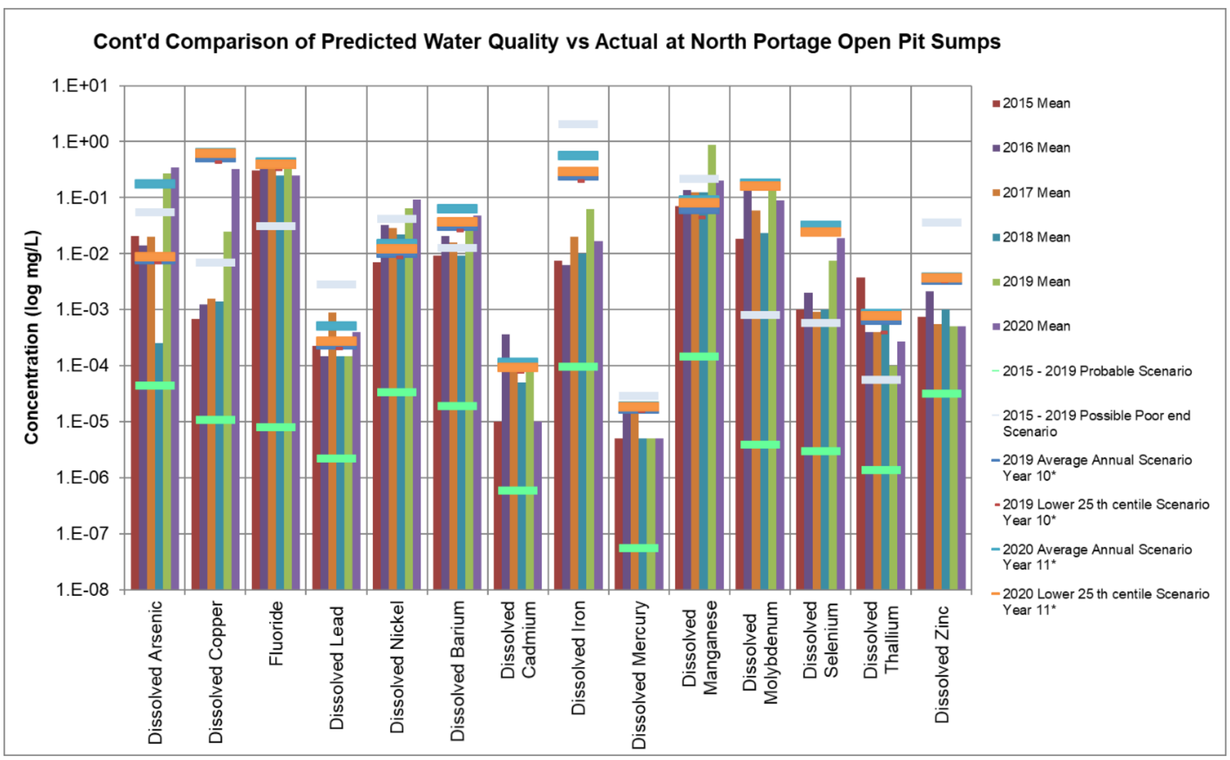


Figure 13 Meadowbank Mean Annual Water Quality – North Portage Pit (Pit A) Sumps





Based on this analysis, many of the predicted values for the Probable and Probable Poor End scenarios and Annual Average and 25% Centile Water Quality Forecast 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 measured 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 was less volume of water to attenuate any contaminant loads that may accumulate in the pit sump water body.
- For Portage Pit, the measured water volumes of 2019 and 2020 were higher than what was originally predicted. This can be explained by the higher observed precipitation at the site and more runoff being directed toward Portage Pit. Consequently, there was more volume of water to attenuate contaminant loads that may accumulate in the pit sump water body.
- The contaminant loads measured in Portage and Goose Pits water were higher than the prediction until 2018. In 2019, the contaminant loads measured in Third Portage and Goose Pits water were lower than the prediction of year 10. However, in Goose Pit, the sample data set available in 2019 for the pit lake was limited. In North Portage pit, some parameters were much higher than the forecasted values of year 10, such as dissolved arsenic and manganese. This can be explained by the additional transfer of reclaim water from the Central Downstream Pond to North Portage Pit that in 2019.
- In 2020, in-pit deposition continued in Goose Pit and started in Third Portage Pit (Pit E). In Goose Pit, there were some measured concentrations higher than the prediction for year 11. Of note, dissolved arsenic and dissolved nickel were significantly higher. A higher proportion of tailings deposited in Goose Pit originated from ore from Whale Tail Pit. This ore was shown to leach out higher concentration for certain metals, such as arsenic.
- For Third Portage Pit, in 2020, the measured values were generally lower than the prediction of year 11, which accounted for the nature of the tailings originating from the Whale Tail Pit. Dissolved manganese and selenium where found to be higher than the model prediction for year 11.
- For North Portage Pit, in 2020, the measured values were generally lower than the prediction of year 11, except for dissolved arsenic, nickel and manganese. The higher load could originate from water transfer from South Cell TSF, Downstream Pond and Goose Pit that occurred in 2020.
- The contaminant loads measured in Vault and Phaser Pits water were generally higher than the prediction. However, there has been a continued improvement in pit water quality year after year since the end of mining at Vault and natural re-flooding was allowed to take place in the pits.
- Higher observed load in the seepages flowing into the pits seems to contribute in part to the contaminant loads observed in Goose and Portage pits.
- Since 2019, in-pit deposition activities in Goose and Portage Pit contribute the main contaminant loading to the pit water.

- 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 influenced 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 from Goose Pit, Third Portage Pit and North Portage Pit 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 and from natural degradation of cyanate, the by-product produced from the cyanide destruction process. Other parameters found in the pit water could originate from the natural groundwater seepage into the pit (i.e. fluoride, sulphates, etc.), from contact of runoff water and seepage water with potentially acid generating (PAG) rock surfaces of the pit wall and/or from loads coming from the reclaim water that is deposited with the tailings in the pits.

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). In-pit tailings deposition in Goose Pit was started in July 2019 and finished in August 2020. It continued in Third Portage Pit as of August 2020. Reclaim water from the South Cell TSF Reclaim Pond and Central Downstream Pond was also transferred to North Portage pit in 2020.
- 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). 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). From 2018 to 2020, 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

Based on the updated Interim Closure and Reclamation Plan 2020, reclaim Water stored in Goose Pit, Third Portage Pit and North Portage Pit shall be treated and discharge to Third Portage Lake following the end of in-pit deposition. Once treatment is completed, aggregate cover construction over the tailings in the pits will begin, if feasible, followed by re-flooding of the pits with natural runoff and water transfer from Third Portage Lake. For this study, parameters of concern were identified using the current Water License limits, however, final site-specific treated effluent discharge limits for closure will be developed through review of the final closure plan by regulatory agencies.

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 at the end of in-pit deposition is in this forecast. Table 4.1 of the Meadowbank Water Quality Forecasting Update for the 2020 Water Management Plan found in Appendix C of the 2020 Water Management Report and Plan Version 9 (Appendix 11) summarizes the forecasted concentrations of applicable parameters in Portage and Goose Pits (based on measured water quality from the TSF) predicted in the pits at the end of in-pit deposition.

Based on the results of the water quality mass balance presented in Section 4.2 of the Meadowbank Water Quality Forecasting Update for the 2020 Water Management Plan, treatment of the reclaim water at the end of in-pit deposition will be required for metals removal (such as for aluminium, arsenic, copper, iron and nickel) and TSS removal. Ammonia removal may also be needed, as well as Total Dissolved Solids reduction.

For the Vault pit, no treatment would likely be required after the pit has been re-flooded prior to dike reconnection. 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 and/or baseline criteria per the Water License. Table 5.1 of the Meadowbank Water Quality Forecasting Update for the 2020 Water Management Plan Report presents the average concentrations of water quality from samples taken in the Vault area in 2020.

Potential treatment option for the removal of the metals in Reclaim Water prior to discharge to Third Portage Lake is caustic or lime precipitation, while aeration is recommended for total nitrogen reduction via ammonia volatilization. Coagulation with ferric sulfate could be used to co-precipitate the arsenic as a ferric arsenate precipitate. Additional treatment steps could be considered once the actual nature of the water to treat is known, such as additional polishing steps, like multimedia or membrane filtration.

For the Vault area, ammonia and nitrate are the parameters of concern identified by Environment Canada, but no actual or forecasted concentration exceeds the Type A Water License discharge requirements for this area. Current concentrations for these two parameters are also below the CCME guidelines.

It is important to note that the water quality in the pits will be subject to CCME guidelines or site-specific criteria and/or baseline criteria per the Water License at closure once the water level in the Goose and Portage Pits are equal to the water level in the Third Portage Lake, following reclaim water treatment and natural and active pit reflooding. The dikes will only be breached once the water quality in the pits meets CCME guidelines or site specific criteria and/or baseline criteria per the Water License 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-WTP1830 Part E, Item 8: ***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.***

As per the NWB requirement, this comparison will be provided once in closure.

4.4.4 Alternative Effluent Discharge Locations

As required by Project Certificate No. 008 Condition 67: ***Subject to the additional direction and requirements of the Nunavut Water Board (NWB), the Proponent shall:***

a)Conduct an evaluation of the potential aquatic effects to Lakes D1 and D5 and downstream that may result from the discharge of treated effluent. The evaluation will include:

- ***Additional water quality and phytoplankton baseline data in Lakes D1 and D5***
- ***Updated water balance and water quality forecast***
- ***Updated near field and far field effluent discharge modelling***
- ***Updated Water management Plan, Water Quality and Flow Monitoring, and Core-receiving Environment Monitoring Plan***

b) Provide adequate rationale for the need to use the alternative discharge contingency, based on the thresholds established as per the Whale Tail Pit Expansion Project water management decision tree.

c) In the event that discharge to Lakes D1 and/or D5 is not approved to proceed by the NWB, the Proponent will develop alternative effluent management plans as part of the Water Management Plan.

Agnico Eagle completed additional baseline data collection in Lakes D1 and D5 in 2020 but no studies were completed as discharge to Lakes D1 and D5 is not considered at this point.

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.

This condition was fulfilled with the submission of the Hydrodynamic Modelling of Mammoth Lake report found in Appendix 16 of the 2018 Annual Report. Agnico will review the hydrodynamic model during operation, if needed, and during closure.

4.6 ADDITIONAL INFORMATION

4.6.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1530 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 2020.

4.6.2 Whale Tail Site

As required by Water License 2AM-WTP1830 Schedule B, Item 28: ***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 2020.

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-MEA1530 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);

As no mining occurred at Meadowbank mine in 2020, no blast holes were analyzed for sulphur and carbon. Agnico Eagle will refer to previous annual report for historical information.

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, no more surface water quality monitoring have been completed since 2012. Previous water sampling results showed no evidence of geochemical issues in the quarries. Agnico will refer to the 2012 and previous Annual Report. The water chemistry in quarries remains consistent between years and due to the isolated nature of the pool, the water collected in the quarry does not likely pose a risk to the aquatic environment. It was recommended that unless turbidity issues are visually observed, surface water quality sampling is not deemed necessary at non-HADD crossings or contact pools. In 2020, no turbidity issues were visually observed so surface water quality sampling was not deemed necessary at quarry contact water pool. As in the past, Quarry 4 and 14 are flooded, as noted in the 2020 Annual Geotechnical Inspection (Appendix 9). 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. Slope remediation is in progress in some quarries but none of them were completely 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.

Beginning of June 2020, small streams began flowing and by end of June all of the streams and rivers along the AWAR opened up. Sixteen (16) formal erosion inspections were completed by qualified environment technicians between May 1st and August 20th 2020 (7 in May, 4 in June, 3 in July and 2 in August) 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 2020.

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

In 2020, Agnico continued to conducts inspections around the Rock Storage Facilities (RSF) to determine if there is seepage at the base of the RSF. In 2020, as in previous years, seepage has been observed. Samples are taken in accordance with the NWB Water License 2AM-MEA1530 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 with 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 effectively control 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-MEA1530. There are no applicable license limits. Results are presented in Table 8-35 for WEP1 and Table 8-36 for WEP 2, 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 were 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 2020, ponded water was observed at the base of the WRSF (sampling station ST-24) and was sampled in June, July, August and September. As per NWB Water License, samples were collected to assess water quality and the results are presented in Table 8-32. No water was pumped from this location as there is no major water accumulation and it's mainly a ponding area without flow. 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 monthly samples of tailings (as per the Pore Water Quality Monitoring Program – Section 5.1.1.1 below) that are sent to an accredited laboratory to analyse for ABA and Metal Leaching. No samples taken in April and May as the mill was not operating. Table 5-1 below presents the results of tailings solids. These sample results are also integrated in the Water Quality Forecast updated yearly.

Table 5-1 Meadowbank 2020 Tailings Solids Monitoring

Analysis	Date / Units	05-Jan-20	08-Feb-20	16-Mar-20	17-Jun-20	09-Jul-20	11-Aug-20	12-Sep-20	12-Oct-20	07-Nov-20	13-Dec-20
NP	t $CaCO_3$/1000 t	50.4	48.5	39.7	65.9	47.3	58	49.3	51.7	71.7	93.3
AP	t $CaCO_3$/1000 t	71.9	95.3	73.4	57.8	75.0	54.7	81.6	83.8	55.6	61.2
Net NP	t $CaCO_3$/1000 t	-21.48	-46.81	-33.74	8.09	-27.70	3.31	-32.26	-32.05	16.1	32
NP/AP	ratio	0.70	0.51	0.54	1.14	0.63	1.06	0.60	0.62	1.29	1.52
Sulphur	%	2.51	3.21	2.28	1.19	2.32	1.70	2.48	2.73	2.07	1.95
Acid Leachable SO4-S	%	0.21	0.16	<0.02	<0.04	<0.04	<0.04	<0.04	0.05	0.29	<0.04
Sulphide	%	2.30	3.05	2.35	1.85	2.40	1.75	2.61	2.68	1.78	1.96
C	%	0.482	0.555	0.640	0.807	0.694	0.740	0.747	0.612	0.984	1.12
CO_3	%	1.16	1.43	1.99	2.64	2.11	2.32	2.28	1.76	3.69	3.91

Analysis	Date	05-Jan-20	08-Feb-20	16-Mar-20	17-Jun-20	09-Jul-20	11-Aug-20	12-Sep-20	12-Oct-20	07-Nov-20	13-Dec-20
	Units										
Final pH	units	1.55	1.56	1.68	1.56	1.56	1.91	1.59	1.59	1.73	1.66
As	mg/L	1.70	2.10	1.40	1.10	1.90	1.40	0.980	1.60	1.50	1.40
Cu	mg/L	0.120	0.078	0.040	0.110	0.078	0.140	0.170	0.110	0.092	0.092
Ni	mg/L	0.800	0.075	0.400	0.800	0.730	0.790	0.670	0.680	0.590	0.700
Zn	mg/L	0.082	0.078	0.086	0.076	0.083	0.084	0.076	0.071	0.070	0.086

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

See Section 5.1.1c above.

5.1.1.1 *Pore Water Quality*

Agnico received on May 24th, 2019 from NWB the Ministers Approval regarding the Amendment No.3 to Type A Water Licence No. 2AM-MEA1526 to authorize Water Uses and Waste Deposits associated with the In-Pit Tailings Disposal Proposal. Tailings generated from the Whale Tail Pit Project will be deposited in the mined-out Goose and Portage pits. As part of their decisions, Agnico was required to submit a Tailings Pore Water Quality Monitoring Program for the Board review and approval (Section IV, Part B: General Conditions). This plan was approved on October 21st, 2019 with a commitment to revisit the Pore Water Quality Monitoring plan as part of the 2019 Annual Report and commit to organize a meeting with ECCC and CIRNAC to discuss of the sampling methodology prior to the update of the plan. The meeting with ECCC and CIRNAC was held on February 6th, 2020. The revised Pore Water Quality Monitoring Program is attached in Appendix 23 of the 2019 Annual Report.

The chemical composition of the mill effluent process water will have significant influence on the quality of supernatant water above the tailings surface (i.e. reclaim water) as well as the exfiltration from the tailings. The chemical composition of the tailings pore water is expected to be controlled by the chemical composition of the mill effluent and the reclaim water, which is a mixture of mill effluent process water and any other direct inputs to the pit (i.e. precipitation, runoff, etc.). Geochemical reactions within the tailings solids themselves are not expected to influence pore water chemistry.

In-Pit disposal in Goose Pits started on July 5th, 2019 and stopped on August 19th, 2020. In-pit disposal in Portage Pit E started on August 20th, 2020 and is ongoing. As part of this program, Agnico collected on a monthly basis one sample of plant effluent slurry representative of the end of pipe prior to tailings disposal in Goose/Portage pits (collected in the mill). Tailings sample were taken every month except in April and May when the mill was not operating. Sample of reclaim water from the Pits where tailings are actively being deposited were also taken, if possible to be done safely, and the result are provided in Section 8.5.3.1 below.

Once Goose Pit has reached its full storage capacity, pore water samples will be collected directly from the in-pit tailings, once it is safe to do. Agnico will sample in-pit tailings for two (2) subsequent years. If year two is within 20% or lower of year one, and within our prediction, then no further sampling in-situ will be performed. Monitoring pore water quality from Goose Pit will provide insights on the behavior of the pore water quality over time as the tailings self-consolidate. The data collected from Goose Pit should be representative of the behavior within Portage Pit A and Pit E since similar tailings are deposited in these pits.

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-WTP1830 Schedule B, Item 10: ***Geochemical monitoring results including:***

After one (1) year of mining activity in Whale Tail Pit and after accumulating substantial information and knowledge of the Whale Tail deposit, Agnico Eagle deems necessary to review the waste sampling default ratios defined by the Operational ARD-ML Sampling and Testing. In this view, an updated Operational ADR-ML Sampling Testing and Plan (Version 6, November 2020) (Appendix 21) which included new sampling frequency in Whale Tail Pit was provided to NWB. This updated plan was approved on January 22nd, 2021.

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 3, March 2020) submitted in Appendix 28 of the 2019 Annual Report. 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 2020, Agnico sampled approximately 25% of the 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 21). See Table 5-2 below for a summary of Acid Rock Drainage (ARD) Guidelines used to classify Whale Tail waste rock. 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.

Table 5-2 Summary of ARD Guidelines used to classify Waste

Initial Screening Criteria	ARD Potential
NPR< 1	Potentially Acid Generating (PAG)
1 < NPR < 2	Uncertain or low acid generating
2 < NPR, As < 75 ppm	Non Potentially Acid Generating (NPAG)
2 < NPR, As > 75 ppm	Potentially Acid Generating (PAG)

The mine geology staff uses the derived NPR and arsenic (As) values to characterize the rock in the blast pattern. Mine surveyors and grade control technicians use this information to delineate and place 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 5-4 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 Whale Tail 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 continue to be applied at the Whale Tail Project. Operational sampling and analysis is completed on site during mining activities in order to identify and delineate the material type in the pits during mining.

The geochemical properties of all mining wastes have been confirmed with duplicates samples sent to a certified laboratory, through both static and kinetic testing on numerous representative samples, by various test methods and through multiple project development stages. In 2020, to validate the method used by Agnico, approximately 392 samples from Whale Tail Pit 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. No samples from IVR Pit, due to both pits sharing common lithologies, were sent externally. The results from the external laboratory confirmed Agnico's methodology and results to differentiate PAG/NPAG rock.

The results of the NPAG-PAG classification confirmation are logged in the Meadowbank LIMS database and also stored as models in MineTrust. 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 in 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 2020, Agnico analyzed 29,718 samples from blast holes at Whale Tail Pit and 8,081 samples from IVR Pit at its on-site laboratory. Refer to Table 5-3 below for the percentage of PAD, uncertain and NPAG per pits.

Table 5-3 Whale Tail Site Geochemical ARD determination 2018-2020 (including all waste types)

Year	Whale Tail Pit			IVR Pit		
	PAG (%)	Uncertain (%)	NPAG (%)	PAG (%)	Uncertain (%)	NPAG (%)
2018	28	11	61	NA	NA	NA
2019	42	11	47	NA	NA	NA
2020	30	11	58	2	1	93

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 23).

Sampling and testing of waste materials for ARD and ML are 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.

If ponding water is found at the base of the WRSF (ST-WT-3), as per NWB Water License, samples were collected to assess water quality and water discharged to the Whale Tail Attenuation Pond. In 2020, water was pumped from this location. Refer to Section 8.5.3.2.2 for a complete discussion of the result. 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 2020.

Pre-freshet and freshet inspections were conducted at crossings along the Whale Tail Haul Road, eskers and quarries in 2020. 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. Freshet leaders were hired in 2020 and were only dedicated to the inspection of Whale Tail Haul Road including the esker, quarries, culvert and bridges. Refer to Section 8.5.3.2.15 for more information.

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

No leaching was observed on the pit slope or dike faces in 2020.

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

There is no geochemical outcomes or observations that could lead to an environmental impact in 2020.

Refer to Section 8.5.8.2.4 for a discussed regarding the WRSF dike flow in 2020.

5.2 WASTE ROCK AND ORE VOLUME

5.2.1 Meadowbank Site

In accordance with NWB Water License 2AM-MEA1530 Schedule B, Item 8: *Volumes of waste rock used in construction and placed in the Rock Storage Facilities.*

There is no more mining in Portage, Vault and Goose Pit so no more waste rock was generated in 2020.

The Mine Waste Rock and Tailings Management Plan (Version 11) was revised in April 2021 and can be found in Appendix 22. Details of all waste rock deposition and tailings management are contained in the revised Plan.

5.2.2 Whale Tail Site

5.2.2.1 *Waste and Ore Stockpile Volume*

In accordance with NWB Water License 2AM-WTP1830 Schedule B, Item 11 *Volumes of Waste Rock used in construction and placed in the Waste Rock Storage Facility.*

And

In accordance with NWB Water License 2AM-WTP1830 Schedule B, Item 12: *Volumes of ore stockpiled and overburden stored at Whale Tail Pit site.*

The total volume of waste rock generated by Whale Tail Pit in 2020 was 28,839,141 tonnes. The use and location of all of the rock, by volume, is presented in Table 5-4 and is identified by the following categories:

- Roads – used for road construction and maintenance;
- WRSF – stored in the Waste Rock Storage Facilities;
- Stockpiles – stored in stockpile for later usage for construction purposes;
- Construction;
  - o Crushers – taken to the mobile crusher and used for construction or maintenance purposes;
  - o Miscellaneous uses;
  - o Pads construction;
  - o Dewatering ramp road construction.

The Whale Tail Waste Management Plan (Version 7) was revised in April 2021 and can be found in Appendix 23. Details of all waste rock deposition and tailings management are contained in the Plan.

Table 5-4 Whale Tail 2020 Rock Volume

Month	Whale Tail Pit								Ore Processed in Mill (tonnes)
	Ore[1]	Waste Rock						Overburden	
		Dikes	Roads[2]	WRSF[3]	Stockpiles	Construction[4]	Total		
January	195,771	-	20,130	1,549,398	31,157	500,689	2,101,374	210,033	332,823
February	164,705	-	13,003	1,255,368	3,301	386,726	1,658,397	334,966	338,470
March	180,719	-	9,320	1,560,672	5,031	323,775	1,898,798	123,090	140,991
April	112,846	33,894	30,569	1,295,063	9,562	358,987	1,728,075	1,534	-
May	291,193	-	39,964	2,252,323	87	307,655	2,600,029	102,109	51,778
June	220,718	-	27,232	2,261,059	58,844	404,077	2,751,212	676	96,443
July	206,971	-	38,429	2,578,092	54,805	270,929	2,942,255	18,565	134,796
August	285,396	-	14,882	2,662,605	53,251	493,149	3,223,887	26,904	140,511
September	332,799	-	144,030	1,977,141	85,286	577,810	2,784,267	224,474	140,758
October	360,984	-	236,103	1,787,253	76,239	36,283	2,135,878	423,077	148,533
November	284,421	-	24,279	1,615,920	81,653	142,759	1,864,611	233,899	83,884
December	396,271	-	23,532	2,893,803	117,918	115,105	3,150,358	-	150,253
TOTAL	**3,032,794**	**33,894**	**621,473**	**23,688,696**	**577,134**	**3,917,944**	**28,839,141**	**1,699,327**	**1,759,239**

1 *All ore mined is stockpiled before it's long hauled to the Mill; Ore Stockpile balance on Dec. 31st, 2020: 664,444 tonnes*
2 *Include road construction and maintenance; excludes Whale Tail Haul Road*
3 *Includes the waste rock that is stored in temporary locations*
4 *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 updates. The last version 7 (April 2021) (Appendix 23) was updated to align with recommendations issued from the various authorities. Agnico will continue to update the plan on an annual basis during the operation phase of the Whale Tail Project.

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 of the 2018 Annual Report) as required by Condition 9. Please refer to this document in for a complete overview of the investigations 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 five (5) specific locations:

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

- IVR D-1 Dike.

Field investigation campaigns have been carried out at the WRSF, Mammoth Dike, 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, on 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.

Geotechnical investigations (test pits and boreholes) were conducted in 2019 and 2020 in the area of the projected IVR D-1 Dike, which will form part of the IVR attenuation pond. The information available indicates that the bedrock depth varies between 2.1 m and 6.7 m below ground surface. hence no major sensitive land features have been identified at these locations. The design report of the IVR D-1 Dike contains all the required information on the field investigations carried out at the IVR D-1 Dike, and should be referred to for all the implications of geotechnical investigations for construction.

5.3 TAILINGS STORAGE FACILITY MEADOWBANK SITE

5.3.1 Tailings Storage Facility Capacity*

As required by NWB Water License 2AM-MEA1530 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 2020 a total of 37 Mt of dry tailings slurry from the mill had been deposited in the TSF's and the In-Pit Tailings Deposition sites as indicated in Table 5-5. In 2020, a total of 5.4 Mt of tailings slurry was deposited in the In-Pit Tailings Deposition sites, representing 2.6Mt dry tonnes. A monthly summary of the tailings produced in 2020 is provided in Table 5-6.

Agnico revised the tailings deposition plan (available in Updated Mine Waste Rock and Tailing Management Plan Version 11 presented in (Appendix 22), to comply with the new LOM produced. The deposition model completed is valid until the end of the mining operation in 2026. 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 and the In-Pit Tailings Deposition sites is designed for end of pipe discharge.

Table 5-7 presents the summary of the tailings management strategy in 2020-2026. More information on the tailings deposition modeling is presented in the Waste and Tailings Management Plan.

The main conclusions from the modeling results are:

- The total maximum capacity of the In-Pit Tailings Deposition sites is estimated at: 42 Mt (without raising the West Road);
- The LOM mill throughput is 32.1 Mt, indicating there is sufficient capacity in the approved In-Pit Tailings Deposition sites.

Table 5-5 Meadowbank Deposition location (realized)

Date	Deposition location	Tailings deposited (dried tonnes)
February 2010 to November 2014	North Cell	16.0M tonnes
November 2014 to July 2015	South Cell	2.7M tonnes
July 2015 to October 2015	North Cell	1.0M tonnes
October 2015 to August 2018	South Cell	10.8M tonnes
August 2018 to October 2018	North Cell	0.5M tonnes
October 2018 to April 2019	South Cell	1.4M tonnes
April 2019 to July 2019	North Cell	0.6M tonnes
July 2019 to December 2019	Goose Pit	1.4M tonnes
January 2020 to August 2020	Goose Pit	1.4M tonnes
August 2020 to December 2020	Pit E	1.2M tonnes

Table 5-6 Meadowbank 2020 Processed Tailings Volume and Associated Properties

Month	Total Dry Tailings (tonnes)	Density of Tailings (% solid)	Density of Slurry (tonnes / m^3)	Tailings Placed in TSF (m^3)
January-20	220316	58.2%	1.63	135,163
February-20	198,217	54.4%	1.63	121,606
March-20	160,266	48.9%	1.63	98,323
April-20	0	N/A	N/A	0
May-20	30,296	57.2%	1.63	18,587
June-20	281,982	46.4%	1.63	172,995
July-20	300,850	46.5%	1.63	184,571
August-20	292,719	46.5%	1.8	162,622
September-20	313,712	46.5%	1.8	174,284
October-20	219,600	46.5%	1.8	122,000
November-20	275,307	46.5%	1.8	152,948
December-20	309,563	46.5%	1.8	171,979
TOTAL	**2,602,828**	**48.1%**		**1,515,077**

Table 5-7 Meadowbank Deposition plan and infrastructure construction – summary

Date	Discharge location	Dry tonnes deposited	Infrastructure construction
January 2021 -July 2022	Pit E	5.70 Mt	• Reclaim water from Pit A a. Reclaim system optimization early in 2021. Increase reclaim capacity by 50 to 100 m^3/h • June to August 2021 and July 2022: Water transfer from Goose Pit to Pit A
August 2022 – July 2023	Pit A	4.18 Mt	• Reclaim water from Pit E • July 2023: Water transfer from Goose Pit to Pit E
August 2023 – July 2025	Pit E	8.50 Mt	• Reclaim water from Pit A • July 2024: Water transfer from Goose Pit to Pit A
August 2025 – July 2026	Pit A	3.40 Mt	• Reclaim water from Pit E • August 2025: Water transfer from Goose Pit to Pit E

5.3.2 Tailings in-Pit Disposal Meadowbank Site*

As required by NIRB Project Certificate No.004, 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 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.

As per Condition 87 (Project Certificate 008), Agnico has submitted the requested study in advance of the Meadowbank In-pit disposal. 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 of the 2018 Annual Report). 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 of the 2018 Annual Report. Agnico have received the Minister approval for the NWB Water License 2AM-MEA1526 Amendment no.3 on May 23rd, 2019.

To ensure the environment protection and evaluate potential risks for tailing migration into groundwater, a feasibility study was conducted by SNC-Lavalin professionals in 2016-2017. The feasibility study included a complementary characterization of the geological structures and permafrost extent on site and the development of a detailed hydrogeological numerical 3D model. Main geological structures (Bay Fault, Second Portage Lake Fault and geological contact with quartzite formation) were identified and implemented in the 3D model with defined hydraulic conductivity and porosity to simulate potential reclaim water seepages out from in-pit tailings pore water. The numerical simulations were designed to represent the worst-case scenarios in terms of contaminant transport within the aquifers. Therefore, a groundwater monitoring program was designed in relation to the groundwater flow and contaminant transport simulation results. The hydrogeological model and solute transport simulations were updated to version 4 during the detailed engineering study completed by SNC-Lavalin and following Natural Resources Canada (NRCan) recommendations addressed during In-Pit Tailings Deposition Project approval process.

In 2018, the latest version of the groundwater numerical model was used to forecast the post closure evolution of chloride concentrations at existing wells, including the four new wells installed in 2018. Breakthrough chloride concentration curves (predicted concentrations of chloride over time at a specific point of the 3D model) were extracted from the model at each monitoring well. Concentration increases over time showed that monitoring wells could intercept the contaminant plume from Pit A, Pit E and Goose Pit after closure over different period and at different concentrations.

As the in-pit deposition project will continue, updates of the hydrogeological model will be performed at closure period using the gathered site data such as ground temperature, hydraulics heads, in-pit tailings pore water quality, etc. Breakthrough curves will be reviewed at this time to adapt the Groundwater Monitoring Plan.

As Goose Pit, Portage Pit A and Portage Pit E are mined out, faults mapping and (location, azimuth, dip, aperture) could be carry out in each current final pit shells. Other former and new structural information can be revisited such as existing televiewer surveys performed in few geotechnical boreholes, specifically in IPD boreholes and in the Central Dike area. Other available investigation results such the pit wall stability analysis or any rock core logging database could be also reviewed to identify main fracture zones or lithology contacts. Relevant information will be integrated to the revised 3D model, at closure period.

The Groundwater Management Plan (Version 11, March 2020 – Appendix 60 of the 2019 Annual Report) 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-MEA1530 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.***

Thermistors 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. The thermistors 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. Tailings that are unfrozen are showing sign of permafrost aggradation over time. Thermistors installed within the Portage RSF indicate that freezeback is occurring within the Portage RSF structures. The instruments show that the active layer is variable in thickness based on the thermistors location. Refer to the Waste Rock and Tailings Management Plan (Appendix 22) and the Meadowbank Thermal Report (Appendix 24) for more information.

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. The capping installed is not representative of the cover system that will be achieved once the final landform is achieved.

Update on Field Trials

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 2019 the RIME finished collecting and analysing the data on the cover field trial and on the long term performance of ultramafic rockfill as a cover material. Research paper on this subject were published in 2020 and 2021. The results of these study will be considered in the update of the closure strategy.

The full list of all publications produced by the RIME related to the TSF and RSF covers is listed below.

RIME Publication List

Conference papers and abstracts

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. (TSF)

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. (TSF)

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. (TSF)

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. (TSF + RSF)

Boulanger-Martel, V., Bussière, B. & Rossit, M. 2020. Determination of the water retention curve of large particle sizes–high water retention capacities materials. 73th Canadian Geotechnical Conference, Calgary, Alberta, Canada. Abstract no. 300 (TSF)

Special presentations

Boulanger-Martel, V. 2019. Thermal performance of two insulation covers to control sulfide oxidation at Meadowbank mine, Nunavut. Canadian Geotechnical Society graduate presentation award, 72th Canadian Geotechnical Conference, St- John’s, Newfoundland and Labrador, Canada. October 1st 2019. (TSF)

Journal papers

Boulanger-Martel, V., Bussière, B. & Côte, J. 2021. Resistance of a waste rock unit to freeze-thaw and wet-dry cycles: implications for use in a reclamation cover in the Canadian Arctic. Bulletin of Engineering Geology and the Environment, 80: 41-54. (TSF + RSF)

Boulanger-Martel, V., Bussière, B. & Côte, J. 2021. Thermal behaviour and performance of two field experimental insulation covers to control sulfide oxidation at Meadowbank mine, Nunavut. Canadian Geotechnical Journal. 58(3): 427–440. doi:10.1139/cgj-2019-0616. (TSF)

Boulanger-Martel, V., Bussière, B. & Côte, J. 2021. Insulation covers with capillary barrier effects to control sulfide oxidation in the Arctic. Canadian Geotechnical Journal. doi:10.1139/cgj-2019-0684. (TSF)

Poirier, A., Bussière, B., Côte, J., & Boulanger-Martel, V. 2019. Thermal behaviour of a waste rock pile located in the Arctic: case study of Meadowbank mine, Nunavut. Paper to be resubmitted to the Canadian Geotechnical Journal in 2021. (RSF)

Thesis

Boulanger-Martel, V. 2019. Évaluation de la performance de recouvrements miniers pour contrôler le drainage minier acide en climat nordique. Ph. D. thesis, Département des génies civil, géologique et des mines, Polytechnique Montréal. 446 pp. (TSF)

Poirier, A. 2019. Étude du comportement thermique d’une halde à stérile située en conditions nordiques. M.S.A. thesis, Département des génies civil, géologique et des mines, Polytechnique Montréal. 196 pp. (RSF)

Published dataset

Boulanger-Martel, V. 2019. Evolution of the physical and mechanical properties of NPAG waste rock cores with respect to freeze-thaw and wet-dry cycles. Mendeley data, v1, http://dx.doi.org/10.17632/2kzf6grgvb.1 (TSF and RSF)

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

This section presents a brief thermal monitoring of the tailings in the TSF and the waste rock in the RSF.. The Meadowbank Thermal Report (Appendix 24) also lists all the thermistors installed within the tailings of the TSF and the waste rock of the RSF and provides the thermal profiles of all the thermistors as well as an interpretation of the results.

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 subjected to freeze and thaw processes. Depending on the cover (tailings or rockfill), the active layer varies due to different thermal processes.

For the TSF, the thermistors are indicating that freezeback is occurring within the North Cell TSF. Instruments located near the pond of water of the North Cell are showing a portion of unfrozen tailings at depth with frozen tailings in surface and a progression of the freezing front advancing at depth.

Instruments installed in the capping or rockfill structure above taillings show that the active layer remained confined in the waste rock showing the effectiveness of the capping concept.

The thermal prediction of the tailings freezeback made by Golder in 2008 indicated that for the more conservative scenario the entire tailings body would be completely frozen within a period of about 40 years after the end of operations with the freezing front advancing into the foundation beneath the tailings in the long term. The results are aligned with this modelling with most data showing a quicker freezeback than anticipated.

In 2019 Agnico initiated a mandate with O'Kane to review the thermal model of the Portage RSF with the objective of evaluating the accuracy of the thermal model by comparing the simulated results with field data collected from the thermistor data.

The study done by O'Kane came to the following conclusion:

- Decreasing trends in active zone depth are recorded at most thermistor locations
- The thermal model predicted colder temperatures near surface compared to recorded near surface temperatures
- Temperature trends are becoming more consistent with simulated temperatures over time
- The observed active zone is generally thicker on the north slope compared to the south slope which is the opposite of the conceptual model.

The conclusion of the 2019 thermal model update of the Portage RSF by O'Kane was that the numerical modelling undertaken in 2016 by O'Kane tended to predict colder soil temperatures than the thermistors during the observed period at all locations. However, the difference between the modelled and observed temperature is becoming less over time and the overall trend in the observed data is becoming more consistent with the model. The timing and amplitude of seasonal trends already show a good match between observed and modelled results, but the model results are shifted lower due to the predicted colder temperatures. It is expected that the trend towards consistency will continue, further increasing confidence.

The detailed analysis of the thermal monitoring is presented in the 2020 Annual Geotechnical Inspection Report (Appendix 9). Table 5-8 below presents the sections of this report associated with each structure. Agnico will refer the reader to the 2020 Annual Geotechnical Inspection Report for a complete review of the results.

Table 5-8 Meadowbank Thermal Data Interpretation Sections in the 2020 Annual Geotechnical Inspection

Structure	Section in the 2020 Annual Geotechnical inspection (Golder, 2020)
Saddle Dam 1	5.2.2
Saddle Dam 2	5.3.2
RF1 & RF2	10.1.2
North Cell Tailings	5.1.2
Stormwater Dike	5.5.2
North Cell Internal Structure	5.4.2

Structure	Section in the 2020 Annual Geotechnical inspection (Golder, 2020)
Central Dike	5.7.2.1
Saddle Dam 3	5.6.2
Saddle Dam 4	5.6.2
Saddle Dam 5	5.6.2

5.4.2 Whale Tail Site

As required by Water License 2AM-WTP1830 Schedule B, Item 21: ***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 (O'Kane) to develop the detailed engineering design for the capping of the Whale Tail RSF. This mandate included thermal modelling to re-assess the capping thickness. This information was also used to inform the instrumentation program to ensure that the WRSF cover performs according to its design intent. These studies were completed in 2019 and provided to the authorities (Landform Water Balance Modelling of Whale Tail and IVR WRSF under RCP8.5., O'Kane Reference No. 948-011-015 rev4 and Amaruq Waste Rock Storage Facility Thermal Cover System Design Basis. O'Kane Reference No. 948-011-M-007 Rev3).

The study "Landform Water Balance Modelling of Whale Tail and IVR WRSF under RCP8.5" completed a landform water balance including estimates of runoff, interflow, and basal seepage rates for different slopes and aspects of the WRSF under the Representative Concentration Pathway 8.5 (RCP8.5) climate change condition. The results of the study provided effective precipitation for the 150-year climate database, provided a surface water balance, concluded that basal seepage will be negligible, determined the interflow distribution by month, and forecasted trends in pore space temperature. Results of the surface water balance support the conceptual model that the hydraulic regimes are expected to be different based on the North and South aspect. Generally, higher net radiation results in greater evaporation and soil heating. With more evaporation, less water is available to runoff and/or infiltrate. Higher net radiation will also result in more sublimation, as more energy is available to convert snow into water vapour.

The study “Amaruq Waste Rock Storage Facility Thermal Cover System Design Basis” goes over the cover system design, the surface water management design, design drawings, construction specifications, and the Operations, Maintenance and Surveillance Manual for the WRSF cover systems.

Agnico Eagle has documented permafrost conditions on site with 45 thermistors placed at strategic locations recommended by the different designers and consultants involved in the project. The Thermal Monitoring Report (Appendix 25) presents a summary of the thermal monitoring program at Whale Tail Pit Project from the period of 2016 to 2020 along with interpretation of the thermistor results.

The data presented in Appendix A of the Thermal Monitoring Report informed and will continue to inform the detailed design of the project infrastructure such as the Whale Tail pit, water management structures, mine site and haul roads, and the waste rock storage facility.

At the WRSF thermistors are showing thermal behaviour along the expected trend (no permafrost degradation) and the instruments are now covered by waste rock. The instrumentation data are showing thermal behaviour along the expected trend at Mammoth Dike and in the talik area of Whale Tail Dike (no change in existing talik condition). A degradation of the permafrost at the Eastern abutment of Whale Tail Dike was observed following flooding of the area in the summer of 2019 (0+710 U/S). This was predicted to occur eventually based on the thermal model of the structure but not within such a short timeframe. The trend of permafrost degradation at the abutment continued in 2020 and was observed at the Western abutment (0+142) and at the Eastern abutment up to Sta 0+750. A degradation of the thermal condition in the keytrench of WRSF Dike was observed in the summer of 2019 leading to seepage attributed to heat transfer from ponded water. In 2020, data are indicating that the areas have frozen back following mitigation measures. The thermistors currently installed near the pit area are following the expected trend and are not showing any impact on the surrounding permafrost.

Agnico updated the Whale Tail Thermal Monitoring Plan (Version 3) in March 2020 and it is presented in Appendix 28 of the 2019 Annual Report.

The detailed analysis of the thermal monitoring of the dikes is presented in the 2020 Annual Geotechnical Inspection Report (Appendix 9). Table 5.9 below presents the sections of this report associated with each structure. Agnico will refer the reader to the 2020 Annual Geotechnical Inspection Report for a complete review of the results.

Table 5-9 Whale Tail Thermal Data Interpretation Sections in the 2020 Annual Geotechnical Inspection

Structure	Section in the 2020 Annual Geotechnical inspection (Golder, 2020)
Whale Tail Dike	4.1.2.2
WRSF Dike	4.2.2
Mammoth Dike	4.4.2

SECTION 6. WASTE MANAGEMENT ACTIVITIES

6.1 GENERAL WASTE DISPOSAL ACTIVITY

6.1.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1530 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 2020 is included in Table 6-1. A total of 3,229.5 m^3 were incinerated. More details regarding quantities incinerated can be found in Section 6.2.1.

Table 6-1 Meadowbank 2020 volume of waste transferred to incinerator

Month	Volume of waste send to incinerator (m^3)*
January	331.8
February	210.1
March	143.8
April	276.5
May	298.6
June	265.4
July	276.5
August	309.7
September	287.6
October	276.5
November	320.7
December	232.3
TOTAL	**3,229.5**

**Volume included waste from Whale Tail Project*

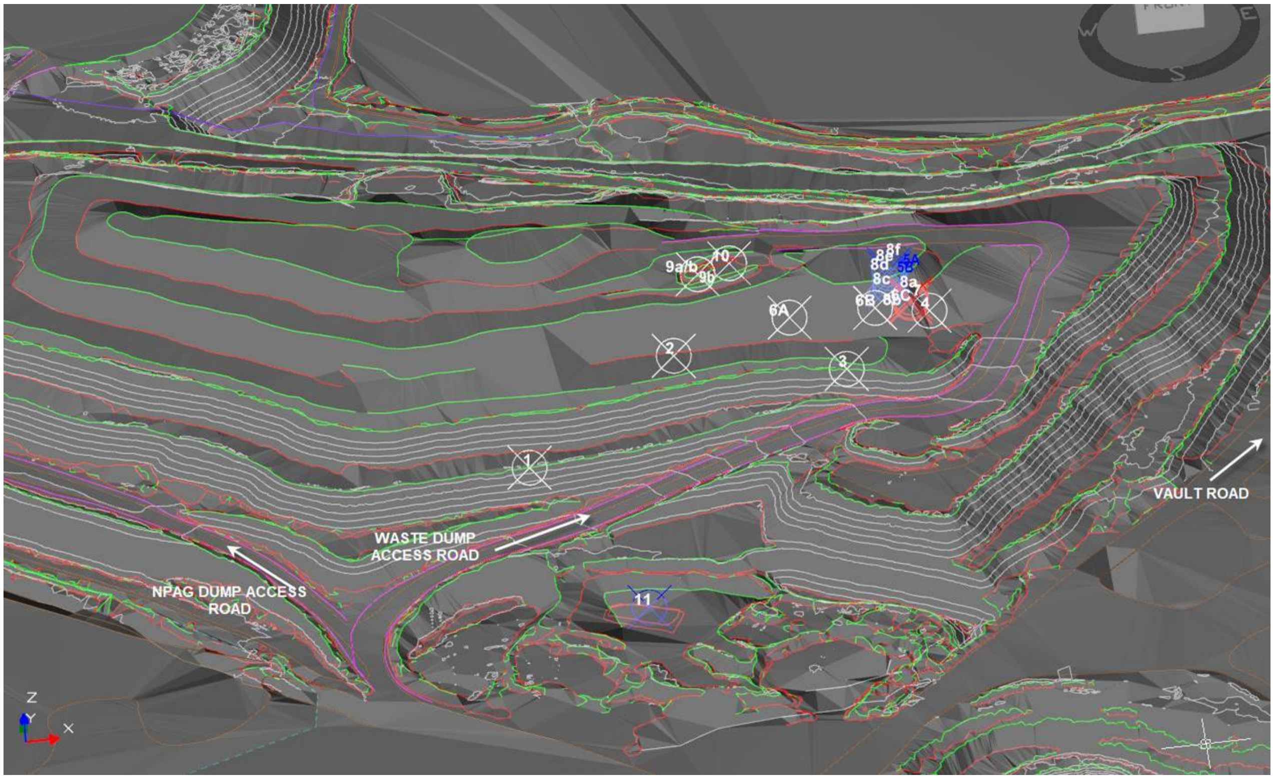
Table 6-2 below indicates the volume of waste in cubic meter (m^3) disposed of in each sub-landfill from 2012 to 2020 and Figure 14 indicates the location of each sub-landfill used to date. The volume of waste landfilled from the start of the project is 113,575 m^3. This is based on the engineering survey done at each sub-landfill. It should be noted that this amount is overestimated as some of the survey were completed once the capping of the landfill were completed. Sometime the waste were not yet compacted in the landfill and the volume is also overestimated. From that amount, Agnico landfilled 4,480 m^3 in

2020. In 2020, sub-landfill #9b and #10 were used for waste disposal and have all been covered with NPAG waste rock by the end of 2020. Landfill #11 is currently in use.

Table 6-2 Meadowbank volume of waste disposed in each 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	17,864	Nov-30-2017
#8b	7215790.10	638878.40	217	2,709	Jan-27-2018
#8b	7215790.10	638878.40	217	13,019	June-01-2018
#8c	7215800.70	638865.40	221	2,800	Oct-01-2018
#8d	7215800.70	638865.40	227	9,377	Apr-04-2019
#8e	7215800.7	638865.4	232	8,482	Aug-01-2019
#8f	7215800.7	638865.4	235	12,175	Sept-02-2019
#9a	7215823.5	638733.9	233	350	TBD
#9b	7215823.5	638733.9	235	4,079	Mar-28-2020
#10	7215829.7	638756.6	235	1,350	Nov-17-2020
#11	7215539.9	638667.8	150	1,691	Active
			TOTAL	**113,575**	

Figure 14 Meadowbank sub-landfill location



In 2020, a total of 175 sea cans containing hazardous waste (653.92 tonnes) were transported to Solva-Rec Environnement Inc., Terrapure and Métaux Depot. In addition, 23 sea cans containing used tires (135.67 tonnes) were transported to Revalorisation TPOL Inc and 101 sea cans containing domestic garbage or expired food waste (238.27 tonnes) were transported to Service Matrec. These companies are all registered companies or disposal facilities located in the Province of Quebec. This amount of sea cans does not include the scrap metal (1,657 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 ES71178-8 (Appendix 26) 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 hazardous and non-hazardous waste disposed by sealift in 2020 are for both Meadowbank and Whale Tail Site. Since 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 6-3 Meadowbank and Whale Tail 2020 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
Waste, Aerosol, flammable	1950	2.1	-	yes	11	drum 205 L	205 L	2,255	537	Cleaning and metal recycling
Waste, Aerosol, flammable	1950	2.1	-	yes	11	Quatrex 765 L	765 L	8,415	1,153	Cleaning and metal recycling
Waste, Batteries, Wet, lead-acid batteries	2794	8	-	yes	69	Quatrex 400 L	400 L	27,600	31,423	Neutralization and metal recycling
Environmentally Hazardous Substances, solid (LEAD) - Lab sample	3077	9	III	yes	2	Quatrex 765 L	765 L	1,530	133	Secure landfill
Waste, Diesel Fuel	1202	3	III	yes	55	drum 205 L	205 L	11,275	8,562	Energy recovery
Waste, Diesel Fuel	1202	3	III	yes	19	tote 1000 L	1000 L	19,000	13,563	Energy recovery
Waste, Flammable liquid, Toluene	1993	3	II	yes	3	drum 205 L	205 L	615	379	Energy recovery
Waste, Gasoline	1203	3	II	yes	7	drum 205 L	205 L	1,435	666	Energy recovery
Waste, Gasoline	1203	3	II	yes	1	tote 1000 L	1000 L	1,000	768	Energy recovery
Waste, Paint	1263	3	II	yes	5	drum 205 L	205 L	1,025	696	Energy recovery
Waste, Paint - Labpack of paint related material	1263	3	II	yes	15	Quatrex 765 L	765 L	11,475	2,543	Energy recovery
Empty drum, last residue cont, oil/grease	N/R[3]	N/R	-	no	286	drum 205 L	205 L	58,630	7,001	Cleaning, reconditioning or metal recycling
Empty plastic pails, last residue cont. Oil/grease	N/R	N/R	-	no	3100	pail 20 L	20 L	62,000	3,100	Cleaning and energy recovery
Empty tote-tank, Residu last contained D.E.F.	N/R	N/R	-	no	9	tote 1000 L	1000 L	9,000	720	Cleaning, reconditioning or metal recycling
Empty tote-tank, Residu last contained Oil/Grease	N/R	N/R	-	no	212	tote 1000 L	1000 L	212,000	13,945	Cleaning, reconditioning or metal recycling
Hydrocarbon contaminated soil non-treatable at landfarm site	N/R	N/R	-	no	5	drum 205 L	205 L	1,025	1,082	Soil treatment and secure landfill
Mixed of oily solid, hydraulic hoses, debris in bulk	N/R	N/R	-	no	1	20-foot container	11000	11,000	1,000	Secure landfill
Mixed waste labpack (Labpack of miscellaneous chemicals)	N/R	N/R	-	no	1	Quatrex 765 L	765 L	765	155	Neutralization and secure landfill
Oily contaminated solid	N/R	N/R	-	no	166	drum 205 L	205 L	34,030	12,210	Energy recovery
Oily contaminated solid	N/R	N/R	-	no	632	Quatrex 765 L	765 L	490,365	145,935	Energy recovery
Oily contaminated solid	N/R	N/R	-	no	1	box 800 L	800 L	800	475	Energy recovery
Oily contaminated solid	N/R	N/R	-	no	3	crate 800 L	800 L	3,000	513	Energy recovery
Oily contaminated solid	N/R	N/R	-	no	21	tote 1000 L	1000 L	21,000	6,283	Energy recovery
Waste, Oil	*Used Oil acceptable for recycling or energy recovery[4]*				67 270	drum tote	205 L 1000 L	194,095	172,745	Oil recycling or energy recovery
	Antifreeze < 30 % + water mixed with waste oil							30,098	30,098	Incineration
	Oily water mixed with waste oil							7,202	7,202	Water treatment and oil recycling
	Used Oil containing Chlorine > 2000 ppm - not acceptable for recycling							3,279	2,918	Incineration
Waste Oily sludge and debris	N/R	N/R	-	no	1	drum 205 L	205 L	205	207	Secure landfill
Waste Oily sludge and debris	N/R	N/R	-	no	1	tote 1000 L	1000 L	1,000	909	Secure landfill
Waste, Activated Alumina	N/R	N/R	-	no	5	drum 205 L	205 L	1,025	857	Secure landfill

Waste, aluminum Sulfate - Alun	N/R	N/R	-	no	5	drum 205 L	205 L	1,025	484	Neutralization and secure landfill
Waste, Antifreeze - concentration less than 30%	N/R	N/R	-	no	2	drum 205 L	205 L	410	433	Incineration
Waste, Antifreeze - concentration less than 30%	N/R	N/R	-	no	11	tote 1000 L	1000 L	11,000	9,459	Incineration
Waste, Antifreeze - concentration more than 30%	N/R	N/R	-	no	10	drum 205 L	205 L	2,050	1,947	Antifreeze recycling
Waste, Antifreeze - concentration more than 30%	N/R	N/R	-	no	65	tote 1000 L	1000 L	65,000	70,321	Antifreeze recycling
Waste, Ashes	N/R	N/R	-	no	63	drum 205 L	205 L	12,915	7,666	Secure landfill
Waste, Crushed lamp containing mercury	N/R	N/R	-	no	3	drum 205 L	205 L	715	584	Neutralization and secure landfill
Waste, Diesel exhaust fluid, D.E.F.	N/R	N/R	-	no	1	tote 1000 L	1000 L	1,000	304	Incineration
Waste, Grease	N/R	N/R	-	no	6	drum 65 L	65 L	390	372	Secure landfill
Waste, Grease	N/R	N/R	-	no	124	drum 205 L	205 L	25,420	10,577	Secure landfill
Waste, Kitchen grease	N/R	N/R	-	no	43	drum 205 L	205 L	8,855	9,461	Incineration
Waste, Oil filters	N/R	N/R	-	no	190	drum 205 L	205 L	38,950	18,678	Metal recycling and energy recovery
Waste, Oil filters	N/R	N/R	-	no	5	Quatrex 765 L	765 L	3,825	1,495	Metal recycling and energy recovery
Waste, Oil filters	N/R	N/R	-	no	1	box 800 L	800 L	800	255	Metal recycling and energy recovery
Waste, Oil filters	N/R	N/R	-	no	5	tote 1000 L	1000 L	5,000	2,111	Metal recycling and energy recovery
Waste, Oily water	N/R	N/R	-	no	6	drum 205 L	205 L	1,230	1,280	Water treatment and oil recycling
Waste, Oily water	N/R	N/R	-	no	58	tote 1000 L	1000 L	58,000	47,344	Water treatment and oil recycling
Waste, Used Activated Carbon	N/R	N/R	-	no	10	Quatrex 765 L	765 L	7,650	3,370	Secure landfill
							Total	**1,470,379**	**653,919**	

1. *Packaging Group as per TDGA*
2. *Transportation of Dangerous Good Act, Canada 1992, S.C. 1992, c. 34*
3. *Not regulated under TDGA*
4. *As per Schedule 6 of Regulation Respecting Hazardous Materials (CQLR, Q-2, r. 32)*

In 2020, Agnico generated approximately 10,813 tonnes of waste for Meadowbank and Whale Tail Site. This represents 69.4.% of general waste disposed in the landfill, 6.5% of organic waste disposed in the incinerator or off-site, 18.4 % of waste recycled on and off-site, and 5.8 % 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 in the same range as previous years.

Table 6-4 Percentage of waste disposed from 2015-2020

Waste	2015 Weight (tonne)	2016 Weight (tonne)	2017 Weight (tonne)	2018 Weight (tonne)	2019 Weight (tonne)	2020 Weight (tonne)	2015 Total waste (%)	2016 Total waste (%)	2017 Total waste (%)	2018 Total waste (%)	2019 Total waste (%)	2020 Total waste (%)	Disposal Recycling location
General	8,561	8,672	8,403	11,073	24,339[6]	7,505[1]	74.9	76.5	78.7	75.7	87.8	69.4	Landfill On-site disposal
Organic	545	541	557	924[2]	810[3]	700[4]	4.8	4.8	5.2	6.3	2.9	6.5	Incinerator On-site/off-site disposal
Industrial/ Hazardous[5]	289	161	243	483	470	622	2.5	1.4	2.3	3.3	1.7	5.8	Off-site disposal + recycling
Waste oil	358	280	280	337	210	162	3.1	2.5	2.6	2.3	0.8	1.5	On-site recycling
Steel	1,449	1,550	1,097	1,690	1,813	1,657	12.7	13.6	10.3	11.5	6.5	15.3	Off-site recycling
Wood	88	55	0	0	0	0	0.8	0.5	0	0	0	0	Baker lake recycling
Batteries	38	17	17	19	19	31	0.3	0.1	0.2	0.1	0.1	0.3	Off-site recycling
Tire	97	67	81	110	63	136	0.9	0.6	0.8	0.8	0.2	1.3	Off-site recycling
TOTAL	**11,425**	**11,343**	**10,678**	**14,636**	**27,724**	**10,813**	**100**	**100**	**100**	**100**	**100**	**100**	

1. *2020 - Volume of general waste sent to Meadowbank Landfill is 3,136 tonnes and to Whale Tail Landfill is 4,368 tonnes based on engineering landfill survey.*
2. *2018 - Volume of organic waste sent to the Meadowbank Site incinerator is 536 tonnes and to Whale Tail Site incinerator is 388 tonnes.*
3. *2019 - Volume of organic waste sent to the Meadowbank Site incinerator is 500 tonnes and to Whale Tail Site incinerator is 310 tonnes.*
4. *2020 - Volume of organic waste sent to the Meadowbank Site incinerator is 462 tonnes and to a registered downsouth company is 238 tonnes.*
5. *Refer to total without batteries weight in Table 6-2 above*
6. *Higher volume of general waste disposed of in 2019 compared to previous are mainly due to the construction and development of the Whale Tail Project and to the fact the that volume reported is from October 2018 to January 2020. amount is overestimated as some of the survey were completed once the capping of the landfill were completed or waste were not compacted in the landfill*

Several projects for waste reduction/recycling were undertaken or were ongoing in 2020 at Meadowbank Complex:

- 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 2020, Agnico reused approximately 184.2 m^3 of waste oil as a fuel source in the on-site incinerator (88.2 m^3) and in waste oil heaters (96.0 m^3). Table 6-9 provides a breakdown of the volume of waste oil incinerated by month. It should be noted that no more waste oil was used in the waste oil heaters starting in April because of the Covid-19 pandemic situation that return at home of some of the employees in charge of filtering the waste oil to be reused. Agnico is planning on continuing to reuse waste oil produced in 2020 during 2021.
- Steel Recycling
  - A total of 1,657 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 2020, aluminum pop cans were not donated to local groups given the restriction related to COVID-19 as it was done in previous years. It is anticipated that these will be donated in 2021 to a local charity if restriction related to the pandemic situation are lifted or shipped south for recycling.
- Battery recycling
  - In 2020, 31.4 tonnes of batteries were shipped south and recycled in an accredited facility.
- Tire recycling
  - In 2020, 135.7 tonnes of scrap tire were shipped south and recycled in an accredited facility.
- Composter
  - In 2020, Agnico continue to use the Meadowbank composter in order to reduce the quantity of waste burned by the incinerator. The composter was in used until March 2020 were is was shut off because of the Covid-19 pandemic situation that return at home some of the employees in charge of it. Agnico is planning to restart the composter in 2021.

6.1.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1830 Schedule B, Item 14: ***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.

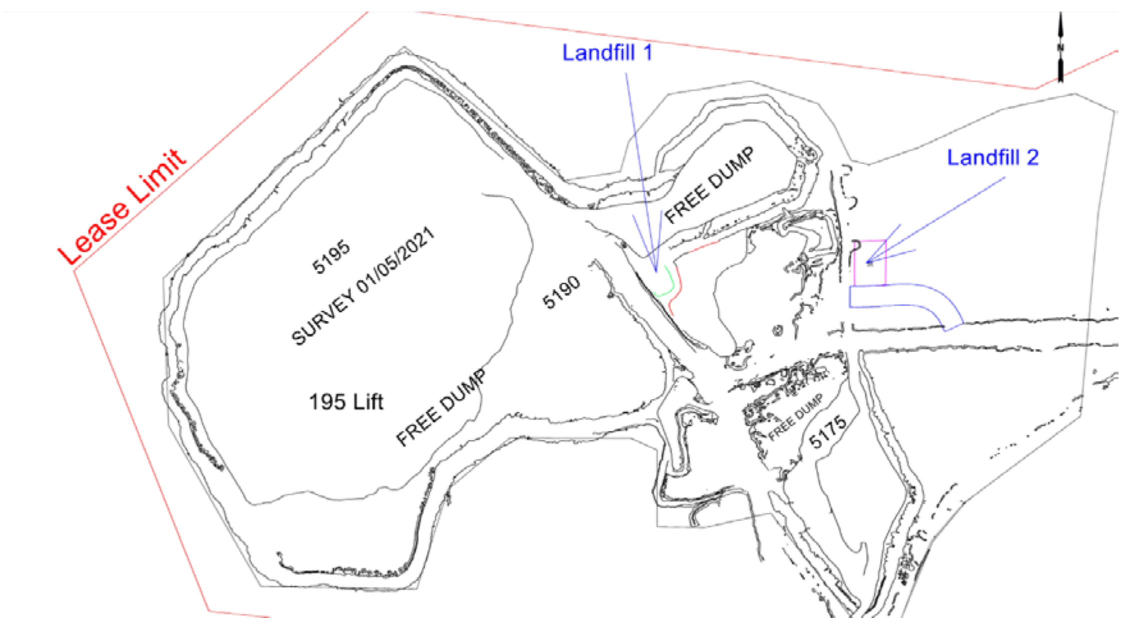
All inert waste that can be landfilled consist primarily of plastics, fiberglass, wood, cardboard, rubber, clothing and some metal that was not recycled. Landfillable waste were transported via the Whale Tail Haul Road to the Meadowbank Landfill up to October 2019. After October 2019 and following the approbation from the NWB to operate a landfill at Whale Tail, waste were no longer sent to Meadowbank but were disposed of directly on site.

Table 6-5 below indicates the volume of waste in cubic meter (m^3) disposed in Whale Tail Landfill starting October 2019 and Figure 15 indicates the location used to date. The volume of waste landfilled since 2019 is 7,987 m^3 on January 14th, 2021. This is based on the engineering survey done at each landfill. From that amount, Agnico landfilled 6,241 m^3 between January 1st, 2020 to January 14th, 2021. Landfill #1 was used for waste disposal for almost the whole year and have been covered with waste rock at the beginning of December 2020. Landfill #2 is currently in use.

Table 6-5 Whale Tail Volume of waste disposed in landfill (from survey)

Landfill	Coordinates (UTM)			Volume	Date Covered
	Northing	Easting	Elevation	(m^3)	
#1	7256069.069	605637.584	168	6,151	Dec-06-20
#2	7256087.459	606021.081	171	1,836	Still active
			TOTAL	**7,987**	

Figure 15 Whale Tail landfill location



There is no incinerator at Whale Tail in 2020 and thus all domestic wastes were sent to the Meadowbank incinerator/composter. There is no distinction possible between the volume site provenance of domestic waste in 2020.

6.2 INCINERATOR

6.2.1 Meadowbank Site

As per NWB Water License 2AM-MEA1530 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 2020. Based on the data recorded, 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 2020, a total of 3,229.5 m^3 of waste burned in the incinerator. The location of the incinerator is highlighted in Figure 1.

In 2020, Agnico noted that there were 2 events (982°C and 851°C) where the temperatures did not reach 1,000°C in the secondary chamber. In 2020, the incinerator was in operation for 292 days. This represents 0.68 % of the total burn, which is not to be considered as significant. In 2018 and 2019 this issue was reported in 2.36% and 19% of burns respectively. This significant decrease clearly shows that Agnico has reset operating conditions of the incinerator.

The current incinerator programing does not allow the primary burn to start before the temperature in the secondary chamber reaches 1,000°C. During the burn, the temperature within the secondary chamber fluctuates, causing the temperature to occasionally fall below the target of 1,000°C and explain the two events of 982°C and 851°C.

Agnico has implemented the following actions to improve the overall performance of the incinerator and to maintain the appropriate temperature of 1,000°C in the secondary chamber throughout the entire burn cycle.

- Average temperature readings will be recorded automatically from the HMI into the daily reports instead of manual instantaneous readings from operators. This will reduce human error and provide a more accurate account of the temperature in the secondary chamber during the burn cycle.

- The temperature in the secondary chamber will be increased to 1,050°C to ensure the temperature does not fall below the recommended 1,000°C at any point in the burn cycle.

- The HMI will be modified to provide temperature trends throughout the burn cycle.

Also some work was completed on the primary and secondary chambers in 2020 to improve the overall performance in 2020. On the primary chamber, replacement of the door refractory bricks including and insulation with high temperature wool inside the chimney left wall. On the secondary, high temperature concrete was applied the top of the secondary chamber.

In 2020, Agnico continued to conduct weekly regular inspections at the incinerator. During the inspection, workers were reminded regularly of 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.

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 / Rm^3 @ 11 % v/v O_2) exceeded the Environment Canada guideline (20 µg / Rm^3 @ 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. In 2020, toolbox meetings on waste management were held with different departments to continue education and improve awareness of employees and contractors.

The number of quatrex of batteries backhauled in 2020 (Table 6-6) confirms the ongoing segregation efforts were effective at reducing the number of batteries burnt in the incinerator.

Table 6-6 Number of quatrex of batteries backhauled 2013-2020

Year	Quantity (unit)
2013	29
2014	12
2015	34
2016	20
2017	20
2018	47
2019	36
2020	69

In accordance with Agnico's Incinerator Waste Management Plan (Version 8, October 2018) and as per KivIA 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 agreed and had increased the stack testing frequency when the mercury exceedance occurred in 2014. Additional stack testing were done yearly from 2015 to 2019 and results are all below the emission standard as showed on Table 6-7. 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*".

Based on the five previous years results, Agnico consulted ECCC on June 30th, 2020 to request the authorization to return to biennial testing. ECCC response indicated that they do not regulate air quality emission but does provide guidance to NIRB when expert advise is requested. As ECCC does not have the authority to permit Agnico to move to biannual stack testing, a communication was send to NIRB on August 19th to request the authorization. On December 3rd, 2020, Agnico received the 2019-2020 Board Recommendation recommending that the stack testing continue to be conduct annually based on the guidance provided by ECCC, the Canada Wide Standards for dioxins and furans, the Canada Wide Standards for mercury, and the requirements of Term and Condition 72.

Agnico was confident that all the regulations and criteria were met and have follow the approved Incinerator Waste Management Plan in order to reduce the stack testing frequency to biennial, following five year of compliance, and therefore stack testing was not completed in 2020.

As mentioned above, Agnico Eagle sent a letter to ECCC on June 30th, 2020 requesting a reduction in stack testing frequency to biennial. ECCC informed Agnico that they do not regulate air quality emissions and the information was provided to the NIRB. Agnico did not receive the NIRB Board Recommendations until December 3rd, 2020 and therefore did not have enough time to schedule and complete the stack testing in 2020.

Agnico Eagle acknowledge NIRB recommendation and rational behind the decision and will continue to do annual stack testing in 2021 on the Meadowbank incinerator and provide the results in the annual report.

Table 6-7 Meadowbank 2014- 2019 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	0.08	0.054
2015		<0.22		0.021
2016		<0.46		0.033
2017		3.80		0.022
2018		<0.19		0.010
2019		0.45		0.027

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

6.2.1.2 *Ash Monitoring*

In 2020, Agnico monitored the ash quality 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. Upon receipt of the December 28th, 2019 chromium exceedance, ash were buried within the Tailings Storage Facility (TSF) instead of the landfill as materials buried within the TSF are expected to freeze over a period of time, resulting in permafrost encapsulation. As per the Incinerator Waste Management Plan, sampling frequency was also increased to monthly in 2020 and is expected to continue until results return below the GN guidelines. Results contained in Table 6-8 indicate chromium, arsenic, barium, and selenium exceedances. Historically, Agnico never encounter any exceedances for arsenic, barium and selenium. Agnico has changed laboratory for ash testing since November 2020 and the results returned below the GN Environmental Guidelines.

An investigation of the possible cause is still ongoing, and as of today several options are considered to explained the exceedances:

-Laboratory problem as once the laboratory was changed in November all the results return below the guideline limits;

-Technician's sampling technique not appropriate;

-New employees hired due to COVID situation that return at home local employees may have bring some deficiencies in waste management;

-Chromium exceedances may be caused by a large presence of metal food cans from the kitchen disposed in the incinerator.

As mitigation measure, the ash sampling method was reviewed with the technician to reassess the importance to take representative sample. Environment department also meet with employees at the kitchen and a 3 month program to segregate metal can from the waste stream was put in place to see if it can be the cause of the chromium exceedance. In 2020, toolbox meetings on waste management were also held with different departments to continue education and improve awareness of employees and contractors, especially with the new employees hired since March 2020 to replace the local employees returned at home due the pandemic situation. However, as the exceedance ceased with the change of laboratory, Agnico is considering a problem with the laboratory as the main cause of the exceedances. Ash composite sample will be taken and send to different laboratories for comparison.

Monthly samples and disposal of the ash within the TSF will continue in 2021 until Agnico is confident that the ash will continue to meet the regulatory guideline and results of the investigation are received.

Table 6-8 Meadowbank 2020 incinerator ash monitoring

Parameters	Units	Guideline for Industrial Waste Discharge*	2020-01-15	2020-02-07	2020-03-17	2020-04-08	2020-05-28	2020-06-15	2020-07-24	2020-08-26	2020-09-29	2020-10-18	2020-11-23	2020-12-12
Arsenic	mg/L	2.5		0.649	0.0075	0.0006	0.0023	<0.0005	0.3335	76	140	35.17	< 0.2	< 0.2
	mgkg		<5											
Barium	mg/L	100		0.09	0.4484	0.4354	0.373	1.1625	0.239	140	55	11.397	1	0.9
	mgkg		34											
Cadmium	mg/L	0.5		0.0041	<0.0001	<0.0001	<0.0001	0.0002	0.0003	<0.0001	<0.0001	0.0701	<0.05	<0.05
	mgkg		2.2											
Chromium	mg/L	5		0.0107	5.47	6.29	6.06	17.98	1.63	5,800	280	23.86	1.1	1.0
	mgkg		74											
Lead	mg/L	5		0.0018	<0.0005	<0.0005	<0.0005	0.0007	<0.0005	1.4	< 0.0005	2.9969	0.1	< 0.1
	mgkg		180											
Mercury	mg/L	0.1		0.00005	0.00034	0.00024	0.00046	<0.00002	0.00038	<0.00002	<0.00002	0.04092	<0.001	<0.001
	mgkg		<0.05											
Selenium	mg/L	1		0.003	0.007	0.009	0.006	< 0.001	0.003	3.6	5.3	0.529	< 0.1	< 0.1
	mgkg		<1											
Silver	mg/L	5		NA-	<0.0005	<0.0005	<0.0005	< 0.0005	<0.0005	< 0.0005	NA	0.0038	< 0.01	< 0.01
	mgkg		31											
Zinc	mg/L	500		2.707	< 0.001	1.582	< 0.001	0.002	0.047	5.4	< 0.001	3.639	< 0.1	< 0.1
	mgkg		150,000											

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

6.2.1.3 *Waste Oil Monitoring*

In 2020, a total of approximately 184.2 m^3 of waste oil was burned in the incinerator and/or in the furnace. Volumes of waste oil reused as fuel in 2020 are presented in Table 6-9. There was no waste oil burn in the furnace since early April as waste oil was no longer filtered due to the employees in charge of this process being sent home to respect the COVID-19 restrictions.

Table 6-9 Meadowbank 2020 volume of waste oil incinerated and consumed

Month	At the incinerator) (m³)	In the furnace at Cat Dome, Blue coverall and SS Coverall) (m³)
January	11.20	29.00
February	7.60	40.00
March	5.20	26.00
April	5.50	1.00
May	5.30	0.00
June	6.15	0.00
July	5.80	0.00
August	12.20	0.00
September	9.80	0.00
October	6.75	0.00
November	5.50	0.00
December	7.20	0.00
Total	**88.20**	**96.00**

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 will minimally sampled the waste oil feedstock twice a year. These data are presented in Table 6-10. In 2020, Agnico collected one waste oil sample per month oil. All metals and PCB parameters met the GN Environmental Guideline.

Table 6-10 Meadowbank 2020 waste oil monitoring

Parameters	Units	Maximum Allowable Concentration *	2020-01-15	2020-02-08	2020-03-17	2020-04-08	2020-05-23	2020-06-21	2020-07-24	2020-08-31	2020-09-29	2020-10-18	2020-11-20	2020-12-12
Cadmium	mg/L	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1**	< 1**
Chromium	mg/L	10	< 1	< 1	1.10	< 1	< 1	< 1	< 1	< 1	1.51	< 1	< 1**	< 1**
Lead	mg/L	100	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	2**	1**
PCB	mg/L	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 2	< 4
Total Halogen	mg/L	1000	72	85	122	67	47	< 50	41	< 50	< 50	274	274	729
Flash point	ºC	≥ 37.7	>80	>80	78	>80	>80	>80	>80	>80	41	>80	83	102

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

6.2.2 Whale Tail Site

As per Water License 2AM-WTP1830 Schedule B, Item 15: *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 associated with the Water License 2AM-WTP1830. In 2020, waste that needed to be burn were hauled to the Meadowbank Site to be burned/composted or shipped down south for disposal.

6.3 ADDITIONAL INFORMATION

6.3.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1530 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 2020.

6.3.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1830 Schedule B, Item 28: *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 2020.

SECTION 7. SPILL MANAGEMENT

7.1 SPILL SUMMARY

The number of spills in 2020 for both Meadowbank and Whale Tail Site are summarized in Table 7-1 below. The construction of the Whale Tail Project started in 2016 with the construction of the Amaruq Exploration Access Road (Whale Tail Haul Road). For this reason, there are no spills to report from the Whale Tail site prior to 2016. Spills that occurred along the Amaruq Exploration Access Road were reported in 2016 and 2017 in the report submitted as part of the NWB Water License 8BC-AEA1525, which was cancelled as of November 2018 and are reported in the Table 7-1 below.

To be consistent with previous years, Agnico will continue to present spills for the Meadowbank Mine site, AWAR and Bake Laker infrastructures (Section 7.1.1) and the ones 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 2020

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**
2019	22	97	**119**	43	177	**220**	**339**
2020	11	38	**49**	21	204	**225**	**274**

With the main mining operation shifted from Meadowbank towards Whale Tail Project in 2019, it was expected to see a significant decrease in spill internally and externally reported at Meadowbank and an increase at the Whale Tail site.

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. Since 2017, the total site spills have continued to decrease as a result of these efforts.

Agnico operates Meadowbank and Whale Tail under extreme cold condition during winter, and thus create extra pressure on equipment that can lead to more frequent equipment failure even if good inspections and maintenance are conducted. In 2020, as per previous and for the following years, particular attention was paid to operating practices on sites. The stand down of equipment during extreme cold temperatures was fully integrated within mining operations and reduced overall pressures on hydraulic systems overall.

Further to daily visual inspection and preventive maintenance that is in perpetual improvement, Agnico has started to reconstruct equipment and stopped equipment during extreme cold condition for to prevent breakdowns. These action items are part of the spill reduction action plan.

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 was developed to be specifically focused on key departments and operators. By continuing education and awareness within our sites, Agnico is confident that the overall environmental impacts are limited. Measures put in place were found to be effective as a decrease in spill overall was observed in 2020.

All internal reported spills and spills 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 2020. 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 2020 by the Environmental Department to different departments at Meadowbank and Whale Tail. Topics during the meetings included spill reporting and spill response;

- A mock spill exercise was completed on September 26th, 2020 at the Baker Lake Marshalling Facility. The scenario was: during a fuel transfer from the vessel to Agnico's tank, a leak was noticed in one of the transfer pipes close to the shore of Baker Lake. 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 be found in Appendix L of the Spill Contingency Plan (Appendix 27).

7.1.1 Meadowbank Site

As per NWB Water License 2AM-MEA1530 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 2020 are 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-MEA1530 and quarterly via the KivIA Production Lease Report. GN Spill Reporting Forms and the follow up reports as requested by the Water License 2AM-MEA1530 Part H, Item 8 for reported spills are included in Appendix 28. 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 2020, ten (10) spills were reported to the GN Spill hotline. Table 7-1 above provide a summary of the reportable and non-reportable spills from 2011 - 2020. The decrease observed in 2018 in the significantly lower number of non-reportable spills reported continued to be observed in 2019 and 2020. This decrease is mainly due to the fact that the construction/operation activities at Meadowbank were lower in 2019 and 2020, i.e. mining activities ceased in October 2019 and construction/operation activities continued to be shifted towards the Whale Tail Project in 2019.

In 2020, one (1) environmental incident was reported to the GN hotline. Tailings dust became airborne at the tailings storage facility due to the tailings being dry and high winds. The incident was reported out of due diligence and is included in Table 7-2 below.

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; and

- 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 KivIA's recommendation regarding the 2017 Annual Report, it was recommended that Agnico provide more detail regarding the contaminated material disposal. 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 KivIA's comments. In 2019, Agnico started to raise worker awareness to the importance to add full details in the spill report regarding contaminated material disposal. Agnico initiated, in 2019, a trial period in the method of reporting spills to the Environment Department, which will improve collecting missing information in the disposal location. However, it should be noted that the contaminated material has always been disposed of as per the Spill Contingency Plan. Agnico intends in 2021 to keep updating and improving the spill reporting procedure and will conduct individual toolbox meetings with all departments to ensure future reporting will have the requested information.

Table 7-2 Meadowbank 2020 spills reported to the GN 24Hr spill HotLine

Date of Spill	Hazardous Material	Quantity	Units (L / Kg/m^3)	Location	Cause of spill	Clean-up action taken	Spill Number
February 6, 2020	Hydraulic oil	150	L	Maintenance shop parking	Drive seal failure	The unit was shut down and spill pads were placed on the ground. The pads were picked up and the contaminated area was scraped clean. Approximately 0.5m^3 was brought to the Meadowbank landfarm	2020-032
February 15, 2020	Contaminated Ice	TBD		Central Dike Seepage	During operations at Meadowbank, water from the Central dike seepage was being pumped back into the South Cell tailings. During a routine inspection (6.2.3 of the Tailings Storage Facility - OMS), ice build up from the seepage discharge crested an area along south portion of the central dike. The ice formed on top of the frozen tailings.	The discharge into the south cell has been stopped and remedial actions are underway.	2020-048
March 11, 2020	Hydraulic Oil	100	L	MBK truck shop parking	During operations at Meadowbank, an operator was moving a tote outside the Maintenance shop and punctured the tote with forks of the loader. Spill pads were placed on the ground and the tote was tipped on its side to prevent any further spill.	Spill pads were collected and brought to the hazmat area. Approximately 2m^3 of contaminated snow and material was collected and brought to the landfarm at Meadowbank.	2020-077
April 7, 2020	Diesel	100	L	Transit area	Punctured Fuel cap - During operations at Meadowbank, both side-mounted fuel tanks were filled on tractor truck 14 by the operator with Diesel fuel at the end of shift. The next morning, the operator noticed that fuel was leaking from a small hole in the fuel tank cap	Spill pads were placed on the ground and the truck was parked in a flat area. Spill pads were collected and brought to the hazmat area. Approximately 3m^3 of contaminated snow and material was collected and brought to the landfarm at Meadowbank.	2020-098
June 9, 2020	Diesel	1,200	L	Baker Lake fuel farm	During operations at Meadowbank, Tanker 7 was refueling at Baker Lake. After refueling the operator pressurized the tanks and fuel started leaking out underneath the rear fuel tank compartment	Spill pads were placed on the ground and a berm was constructed to stop any fuel. A second tanker was parked next to Tanker 7 and began pumping out the rear fuel compartment. Contaminated soil picked up and disposed of appropriately at MBK	2020-174
August 28, 2020	Engine oil	205	L	Spud barge Baker Lake	Loader was moving cargo at the Baker Lake spud barge when his forks came in contact with a drum	Remove the contaminated soil with the loader and place in the containers for the spills	2020-294
September 22, 2020	Diesel/contaminated water	503,000	L	Baker Lake Fuel Farm tank 5	During a routine inspection at the Baker Lake Farm, fuel was observed in the secondary containment of fuel tanks 5 & 6. After further inspection, a small fuel leak was observed	An investigation including corrective actions to empty and repair the fuel tank are underway. The spill was all captured within the secondary containment of tanks 5 and 6 and will be removed and brought to Meadowbank. The water and fuel within the secondary containment of tanks 5 & 6 was pumped into 50,000L fuel tanks and brought back to the Meadowbank facilities. Fuel was segregated as much as possible by locating the pump suction at the surface to pump fuel out first. A total volume of 403,000L of contaminated water was retrieved, and sent to the Meadowbank facilities, while approximately 100,000L of fuel was able to be retrieved. This brings a total volume retrieved from the secondary containment of 503,000L, with all of the spill contaminants contained within the secondary containment of the fuel tanks	2020-351
October 6, 2020	Tailings Dust	NA		Tailings storage facility	It was observed that wind was carrying tailing dust	Additional monitoring of lakes in the surrounding area was	2020-387

Date of Spill	Hazardous Material	Quantity	Units (L / Kg/m^3)	Location	Cause of spill	Clean-up action taken	Spill Number
(Environmental Incident)					airborne on a large area extending outside the property. Impact on env are unknown yet but this is reported as due diligence. This might not qualify as a spill.	completed and a short-term dust suppression plan was developed and implemented. A long-term dust mitigation plan is currently being developed.	
October 8, 2020	Diesel	250	L	Baker Lake OHF	Overfilling of fuel tank	Contaminated soil was removed and adequately disposed of in contaminated soil bin.	2020-389
October 21, 2020	Waste Oil	200	L	Dyno Noble Waste Oil Sea can	Waste oil tote tipped while being put into sea can, the lid was not on properly and waste oil spilled onto the ground.	Contaminated soil was removed and put in the MBK landfarm for disposal	2020-412
December 3, 2020	Diesel Fuel	500	L	Baker Lake Fuel Farm Transfer Area	A breather on the fuel tanker failed causing a buildup of pressure in the tanker compartment which caused diesel to spill.	The spill was contained using spill pads and the fuel tanker was emptied into a nearby tanker. The contaminated material was cleaned up, put into the contaminated soil bin, and sent to the MBK landfarm.	2020-450

Table 7-3 Meadowbank 2020 non-reportable spills

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
January 7, 2020	Diesel	5	L	LHT fuel farm	LHT driver noticed there was a fuel spill at the fuel farm and reported it.	Scraped up the contaminated soil and picked it up. Contaminated soil picked up and disposed of appropriately
January 9, 2020	Diesel	10	L	Fuel Farm Meadowbank	Top loading arm was leaking from the elbow	Contaminated snow picked up and disposed of in a drum
January 13, 2020	Diesel	10	L	MBK Fuel Farm	Top loading arm was leaking	Contaminated snow picked up and disposed of adequately.
February 4, 2020	Coolant	0.5	L	Parking environment office MBK	When doing the morning inspection around the pick-up, a little puddle of glycol/coolant was found under the pick-up.	Stopped the truck to stop the coolant from dripping. Picked up the spill with a shovel and adequately disposed of the contaminated material.
February 6, 2020	Engine Oil	2	L	Environment office parking	At first start in the morning, the pickup leaked engine oil on the ground.	Stop the engine. Put absorbent pads underneath the vehicle. All contaminated material was disposed of adequately
February 12, 2020	Coolant	4	L	SS Coverall	Coolant hose failure	Stop the excavator and clean the spill. Contaminated material disposed of in the contaminated material bin
February 15, 2020	Engine Oil	5	L	Pushback parking	Equipment failure	Contaminated material picked up and disposed of adequately
February 17, 2020	Sewage	20	L	Vault Washroom	Operator unhook hose too fast causing spill.	Contaminated material disposed of in the tailings pond
February 22, 2020	Coolant	20	L	FGL area	Coolant hose failure	Contaminated material picked up and disposed of adequately
February 22, 2020	Coolant	20	L	FGL garage	Coolant O'ring failure	Contaminated material picked up and disposed of adequately
February 29, 2020	Sewage	20	L	Vault Washroom	The sewage truck was pumping at Vault washroom and made a spill when he unplug the hose from the sewage truck.	Contaminated material disposed of in the tailings pond
March 1, 2020	Calcium chloride	2	Kg	Mill door B	Employee brought 4 Calcium chloride bags to the mill door B and 1 of them had a hole on the side	Used plastic wrapping to stop the spill. Contaminated soil picked up and disposed of on the tailings at the Mill
March 13, 2020	Hydraulic Oil	20	L	Maintenance Shop, in front of door 10	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of adequately
March 18, 2020	Coolant	5	L	AWAR KM 19	Truck rolled over and engine fluid leaked out	Secondary container was installed underneath. Spill was contained and contaminated soil picked up and disposed of appropriately
March 29, 2020	Coolant	5	L	Vault Parking	Leak on heating system.	Put absorbent pad on ground and inside the comportment to avoid fluid to drop on ground. Shut down the heating system and repair the leak. Contaminated soil was brought to the yellow bin
May 9, 2020	Diesel	25	L	MBK fuel farm for Long Haul Trucks	Spill during refuelling	Contaminated soil picked up and disposed of appropriately in the petroleum bin
May 10, 2020	Coolant	10	L	Site Service Coverall	Radiator failure	Contaminated soil picked up and disposed of appropriately in the yellow bin
May 18, 2020	Diesel	20	L	AWAR KM 99	Slippery road conditions. Tractor trailer roll over the AWAR	Assess the area. Absorbents pads and half cut drum were installed under the leaking tank. Unplugged the batteries, turn the swift off. Contaminated material disposed off adequately at MBK
June 12, 2020	Diesel	15	L	Fuel Farm	Perforated fuel tank was accidentally fueled.	Spill was contained and cleaned up with loader and brought to contaminated soil area.
June 16, 2020	Hydraulic Oil	30	L	Reefer pad MBK	O-ring failure	Stop the engine, call supervisor and install rag/absorbent on the ground. Contaminated soil picked up and disposed of appropriately at MBK landfarm

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
June 20, 2020	Diesel	30	L	AWAR KM 62	The hose elbow between the fuel tank and the engine start to leak due to wear and tear	The operator install rags and half drum to contain the diesel fuel, use material coming from container at bridge KM 62. Contaminated soil picked up and disposed of appropriately at MBK landfarm
June 22, 2020	Oil	2	L	Winter parking	Oil seal failure on the transmission	Install rags and pale under the leak. Contaminated soil picked up and disposed of appropriately at MBK landfarm
July 25, 2020	Engine Oil	25	L	Transit pad	Equipment failure	Spill pad was use right away and environmental department was called. Spill was contained and contaminated soil picked up and disposed in the contaminated bin.
July 25, 2020	Hydraulic Oil	20	L	AWAR KM 8	Hydraulic filter housing broke while driving	Spill pads were put down to soak the oil on the surface and they pick up the rest and put aside the contaminated soil to be picked up with a loader and disposed of the MKB landfarm
August 13, 2020	Diesel	5	L	Truck Shop	The Fuel Truck 35 was leaking during the night.	Spill was cleaned up and contaminated material was disposed on the contaminated roll off
August 15, 2020	Transmission Oil	5	L	Freshwater Barge Road	Transmission failure on equipment	Spill was contained and contaminated soil picked up and disposed in the contaminated bin
August 16, 2020	Hydraulic oil	5	L	Leach Tank	Hydraulic hose failure	Operator turned off the machine and called dispatch for repair. Spill was contained and contaminated soil picked up and disposed in the roll off contaminated bin.
August 17, 2020	Waste oil	75	L	Outside Incinerator	The Loader Operator was moving waste oil totes at the incinerator and hit one tote with the loader forks when he was trying to put the tote inside the seacan.	Spill was cleaned up and dispose the contaminated soil at the Landfarm.
August 25, 2020	Oil	5	L	Dome warehouse	Oil cylinder failure	Absorbent pads used to contain and clean the spill. Contaminated material disposed off adequately
August 25, 2020	Diesel	2	L	Tank Farm Baker Lake	Equipment failure	Contaminated material disposed in the yellow spill container
August 31, 2020	Hydraulic Oil	40	L	Hazmat area incinerator	An employee was putting away a grease drum in a seacan and he poked a hole in the drum, about halfway on the drum, while operating.	Put spill pads (about 75 white pads) right away and then got the hyster to remove the seacan to be able to pick up the soiled dirt underneath. Contaminated material disposed off adequately
October 6, 2020	Diesel	2	L	Fuel Farm	Equipment failure	Spill was cleaned using absorbent pads and the contaminated material was adequately disposed of. Yellow tag was put on the nozzle to notify workers and site services was notified to repair the nozzle
October 21, 2020	Hydraulic Oil	30	L	Winter Parking	Equipment failure	Contaminated soil was removed and put in the MBK landfarm for disposal.
October 25, 2020	Hydraulic Oil	30	L	Fountain Tire Shop	Equipment failure	Contaminated soil was removed and adequately disposed of.
October 25, 2020	Diesel	0	L	Freshwater Barge Road	Equipment failure	Spill pads were used to clean up the spill. Spill pads were then adequately disposed of.
November 18, 2020	Hydraulic Oil	50	L	Old Portage Washroom Area	Hydraulic hose failure	Contaminated material was removed and put in the landfarm at MBK.
December 22, 2020	Engine Oil	75	L	Vault Coverall	Damaged seal at oil delivery station	Contaminated material was adequately disposed of.
December 23, 2020	Coolant	15	L	Maintenance Shop	Broken radiator	Contaminated material was removed and disposed of in the yellow bin.

7.1.2 Whale Tail Site

As per NWB Water License 2AM-WTP1830 Schedule B, Item 16: ***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 2020 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-WTP1830 and also reported quarterly via the KivIA Production Lease Report. GN Spill Reporting Forms and the follow up report as requested by the Water License 2AM-WTP1830 Part H, Item 8 for reported spills are included in Appendix 29. The spills presented in Table 7-4 and 7-5 below only include spills related to the Whale Tail Site and Whale Tail Haul Road.

In 2020, twenty-one (21) spills were reported to the GN Spill hotline which represents a significant decrease from previous year 2019. Table 7-1 above provides a summary of the reportable and non-reportable spills from 2016 -2020.

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 Whale Tail 2020 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 20, 2020	Engine Oil	150	L	Maintenance shop	A worker was moving totes in and out of a sea-can. The operator was unaware he punctured a tote. During night shift, another worker went to get a tote from the sea-can and discovered the spill.	Contaminated soil picked up and disposed of appropriately in the yellow roll-off bin	2020-019
January 21, 2020	Waste Oil	200	L	Hazmat area	An operator was moving totes at the hazmat area and punctured a waste oil tote with the forks	Contaminated soil picked up and disposed of appropriately in the yellow roll-off bin	2020-020
February 10, 2020	Diesel	130	L	Whale Tail Pit	Wiggins nozzle malfunctioned	The operator shut down the equipment and called maintenance to replace the Wiggins nozzle. Candles were placed around the spill until it could be cleaned up. Approximately 2m^3 of contaminated snow and material was collected. All of the contaminated material will be brought to the landfarm at Meadowbank	2020-039
February 26, 2020	Hydraulic Oil	182	L	Channel Road	Hydraulic hose failure	The contaminated snow and rocks were taken to the contaminated materials bin at the HAZMAT area	2020-064
March 10, 2020	Hydraulic Oil	400	L	Whale Tail Pit	During operations at Whale Tail Pit, DOZ03 was parked and idling when it caught fire. The Emergency Response team was called to put out the fire and sprayed water on the unit until the fire was out. The area was blocked off, absorbents and material was put down across the road to block stop the oil and water from the dozer from spreading	The spill will be collected and brought to the Meadowbank land farm once the scene is unfrozen and the equipment is removed.	2020-093
April 4, 2020	Diesel	100	L	Whale Tail Pit Phase 3	Damaged Fuel Cap - When the fuel truck finished refueling HTR22, the operator noticed that the wiggins would not fully close and fuel was spilling on the ground.	An empty 45 gallon drum was placed under the fuel cap to collect fuel from the leaking part. All of the contaminated material will be collected and brought to the Meadowbank land farm once the Haul Truck is repaired and moved out of the way.	2020-094
May 6, 2020	Hydraulic Oil	400	L	Phase 3 Pit	Hydraulic fan failure	All contaminated material collected and brought to the Meadowbank landfarm.	2020-125
May 7, 2020	Coolant	150	L	PAD C (ore pad)	Coolant hose failure	Mechanics repaired equipment. All contaminated material will be collected and brought to the Meadowbank Tailings Pond.	2020-128
May 17, 2020	Engine Oil	250	L	SANA Garage	Damaged tote while transporting	A loader cleaned the area. All contaminated soil brought to the Meadowbank land farm.	2020-140
May 19, 2020	Hydraulic Oil	125	L	Road 3 Phase 3 Pit	Seal failure	The operator immediately stopped the equipment. All contaminated material will be collected and brought to the Meadowbank landfarm.	2020-143
May 21, 2020	Hydraulic Oil	200	L	WT Pit	Equipment failure	The operator stopped the equipment. All contaminated material will be collected and brought to the Meadowbank landfarm.	2020-148
May 29, 2020	Diesel	200	L	WT Retorque pad	Fuel tank failure	Approximately 2m^3 of contaminated material was collected and will be brought to the Meadowbank land farm.	2020-152
June 14, 2020	Diesel	400	L	WTHR KM 115 near Vault laydown	The drive shaft of long haul truck 15 came off and hit the fuel tank. The weight of the drive shaft cracked the tank on both side.	A berm was constructed to prevent fuel seeping, spill pads and secondary containment was put under the tank until it could be pumped out. Approximately 10m^3 of contaminated material was collected and will be brought to the Meadowbank land farm.	2020-178
July 7, 2020	Diesel	200	L	WTHR KM148	Yoke on the driveline broke and punctured a hole in	Maintenance to complete repairs. Spill was contained and contaminated	2020-420

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken	Spill Number
					the passenger side fuel tank	soil picked up and disposed in the contaminated bin.	
July 26, 2020	TSS	NA		Near underground maintenance shop	Runoff	During routine inspection, water runoff near underground maintenance shop appeared high in TSS. Source of water is undetermined, with investigation ongoing. Water samples were taken immediately, and sent for full analysis. Results were received on August 6th, and showed high level of TSS (345 mg/L). However, field inspection revealed water running off downhill appeared much clearer. Straw booms are deployed to maximize containment. Further samples will be taken at additional locations, and validate no impacts to surrounding lakes occurred.	2020-0317
August 11, 2020	Diesel	125	L	WTHR KM 155	Fuel Tank broken on long haul truck	Spill was contained with absorbent pads and picked up by loader. Spill was contained and contaminated soil picked up and disposed in the contaminated bin.	2020-325
September 9, 2020	Hydraulic Oil	650	L	WTHR road KM 172	Truck went off the WTHR.	Contaminated material was adequately disposed of.	2020-328
October 9, 2020	Hydraulic Oil	140	L	IVR Pit	Equipment damage and broken hydraulic hose	Contaminated material was placed in the contaminated soil bin and will be brought to the MBK landfarm	2020-391
October 27, 2020	Hydraulic Oil	1,400	L	IVR Pit	Equipment damage and broken hydraulic hose	Contaminated material was placed in the contaminated soil bin and will be brought to the MBK landfarm	2020-422
November 25, 2020	Coolant	375	L	Whale Tail Pit	Fan hub failure causing broken radiator	Contaminated material was removed and placed in a roll-off bin then disposed of in the Tailings Storage Facility at MBK.	2020-445
November 26, 2020	Hydraulic Oil	189	L	Whale Tail Pit	Hydraulic hose failure	Contaminated material was removed and adequately disposed of.	2020-447

Table 7-5 Whale Tail 2020 non-reportable spills

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
January 2, 2020	Hydraulic Oil	20	L	Construction Pad H	Hydraulic hose failure on equipment	The operator stopped the equipment right away and called the supervisor. Spill was contained and contaminated soil picked up and disposed of appropriately in the roll-off bin
January 4, 2020	Hydraulic Oil	20	L	Beside wing 8 explo	Hydraulic tank oil cap pop-off and release a splash of oil on the snow	Operator call the team leader right away and stop the loader. Call the loader 6 operator to remove the spill as soon as possible. Contaminated soil picked up and disposed of appropriately
January 6, 2020	Hydraulic Oil	15	L	WRSF	Equipment failure	Called supervisor and shut off the engine. Spill was picked up and brought to the yellow bin
January 6, 2020	Coolant	10	L	WTHR KM 121	Equipment failure	Service truck was sent to fix the leak. Contaminated soil picked up and disposed of appropriately
January 7, 2020	Coolant	45	L	Waste dump parking	Coolant leak on the engine	Shut the truck down and called dispatch to inform the service shop of the breakdown and to fix the haul truck. Contaminated soil picked up and disposed of appropriately at the MBK tailings
January 9, 2020	Hydraulic Oil	10	L	Sana parking	During a cold start of the truck, the wheel seals did not replace, which caused the hydraulic oil present in the hose to flow	Spill was picked up and brought to the yellow bin
January 13, 2020	Hydraulic Oil	20	L	Whale Tail Pit	Quick attach hose loose	Stop Equipment and called mechanic to get it repair. Spill was picked up and brought to the yellow bin
January 16, 2020	Hydraulic oil	71	L	Whale Tail Pit	Hydraulic hose fan failure	Contaminated soil picked up and disposed of appropriately
January 17, 2020	Coolant	5	L	WTHR KM 123	Fan belt broken and cut coolant line	Absorbent pads used to contain the spill. Contaminated soil picked up and disposed of appropriately
January 20, 2020	Engine Oil	8	L	Q2 5137MSW65	O ring failure	The mechanic was called to repair the leak. Contaminated soil picked up and disposed of appropriately in the yellow roll-off bin
January 20, 2020	Hydraulic Oil	30	L	Whale Tail Pit	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately in the yellow roll-off bin
January 24, 2020	Hydraulic Oil	32	L	Channel Road	Hydraulic hose fitting failure	Contaminated soil picked up and disposed of appropriately in the yellow roll-off bin
January 25, 2020	Hydraulic Oil	45	L	Whale Tail Pit	The cylinder of the bucket broke down	Contaminated soil picked up and disposed of appropriately in the yellow roll-off bin
January 26, 2020	Compressor Oil	25	L	Whale Tail Pit	Victaulic seal busted	Absorbent pads used to contain the spill. Contaminated soil picked up and disposed of appropriately in the yellow roll-off bin
January 28, 2020	Coolant	75	L	Whale Tail truck shop	45Gallon drum got punctured in the waste container by a forklift fork.	Rags were put down to absorb most of the coolant but some spilled out of the container. Contaminated soil picked up and disposed of appropriately in the yellow roll-off bin (goes to MBK tailings)
January 30, 2020	Hydraulic Oil	40	L	WTHR KM 154	Equipment failure	Contaminated soil picked up and disposed of appropriately at the MBK landfarm
January 31, 2020	Hydraulic Oil	20	L	Whale Tail Pit	Hydraulic hose failure during drilling operations	The drill was stopped and absorbent pads were placed. The equipment was tagged out and the hydraulic hose was changed right away. Most of the spill was

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
						contained within the bottom of the rig. Spill was contained and contaminated soil picked up and disposed of appropriately
January 31, 2020	Hydraulic Oil	60	L	Ring road, near WT Pit entrance	Hydraulic hose of the traction engine broke	The contaminated soil was removed during the night shift and brought to yellow bin
February 1, 2020	Hydraulic Oil	1	L	Quarry	Hydraulic oil was noticed leaking by the vent of the drill engine.	A spill pad was added to catch the drips, but some fell to the ground. The contaminated material was picked up and the pad was replaced in a way to ensure it would not fall again. Contaminated spill pads placed in oily solids waste and contaminated soil in the roll-off for further disposal at MBK landfarm
February 2, 2020	Hydraulic Oil	50	L	Whale Tail Pit	Hydraulic hose failure	Shut off engine. Contaminated material was picked up and disposed adequately
February 2, 2020	Engine Oil	20	L	Old Truck parking	Equipment failure	Operator shut the engine off. Contaminated material was picked up and disposed of in the underground shop yellow bin.
February 4, 2020	Hydraulic Oil	5	L	Waste dump	Spill when changing hydraulic lines on equipment	Contaminated material was picked up and disposed of in yellow bin.
February 5, 2020	Engine oil	20	L	AMQ20-2158 SH-92(4)	Fire on equipment	Evacuate the drill, call code 1 and the spill will be recovered when investigation is done. All contaminated material will be disposed of adequately in the yellow bin
February 6, 2020	Coolant	15	L	Behind FWTP	The coolant drain valve got hit by a piece of the pipe during installation.	Most of the coolant was recover with 2x 5 gallons bucket. The zone was immediately clean with excavator and loader.
February 8, 2020	Hydraulic Oil	40	L	HTR parking main camp	Quick attach hose failure	Stop equipment to stop the leak and pick up the spill and brought to yellow bin at UG shop
February 8, 2020	Diesel	20	L	On road 7 by road 3	HTR02 had stalled. The mechanic noticed the fuel filter on the road, the filter block was cracked and had fallen	Call mechanic for repair. Contaminated material was picked up and disposed of in the yellow bin
February 8, 2020	Hydraulic Oil	20	L	Sana crusher STP	Coolant hose failure	Spill picked up and disposed in yellow bin
February 12, 2020	Hydraulic Oil	50	L	Waste Dump	Hydraulic hose failure on the boom cylinder	Stop the engine right away and called the dispatch for the mechanic. Contaminated material picked up and disposed of adequately
February 13, 2020	Transmission Fluid	30	L	WTHR KM 154	Transmission failure on equipment	Tow haul operator installed spill kit to contain the leak. Leak has been picked up and disposed in the contaminated bin.
February 14, 2020	Engine Oil	30	L	Main camp parking	Equipment failure	Stop the engine. Contaminated material picked up and disposed of adequately
February 14, 2020	Hydraulic Oil	20	L	Pattern 5130MSW80	Hydraulic hose failure	Equipment was shut down and mechanic was called for repair. Contaminated material picked up and disposed of adequately
February 15, 2020	Engine Oil	10	L	SANA Parking	Engine breather jam by ice, causing pressure and the engine oil blow out.	Stop the engine. Contaminated material picked up and disposed of adequately
February 17, 2020	Engine Oil	5	L	SANA Parking	The engine oil seal blow out.	Stop the engine. Contaminated material picked up and disposed of adequately
February 17, 2020	Hydraulic Oil	30	L	Dewatering Pad	Hydraulic hose failure	Stopped the engine right away and called the dispatch for the mechanic. Contaminated material picked up and disposed of adequately

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
February 22, 2020	Coolant	50	L	WTHR KM 124	Broken belt	Repair broken components. Material collected after repairs are made. Contaminated material disposed off in the MBK tailings pond
February 26, 2020	Transmission Fluid	15	L	Construction Pad H	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 28, 2020	Diesel	10	L	Whale Tail Pit	Diesel hose failure	diesel and contaminated snow into a 5 gallon pail and dumped it in the yellow bins at the hazmat area behind the underground shop
February 29, 2020	Coolant	20	L	Phase 1 5109MSW05	Coolant hose failure	A 980 loader scraped up the material and dumped it in the contaminated soil bin.
March 2, 2020	Diesel	0.25	L	RIG 5 on the side of road 7	When refueling the fuel canon, it was not leveled so the gage was not reading the right level and got overfilled	Stop refueling and add absorbent pads to clean the spill. Contaminated soil picked up and disposed of on quatrex for oily solid
March 3, 2020	Hydraulic Oil	30	L	Whale Tail Pit Pat# 5130MSW68	Hydraulic hose failure	Absorbent pads were placed over the spill. The mechanic was called to replace the hose. Spill was contained and contaminated soil picked up and disposed of appropriately
March 3, 2020	Coolant	15	L	Mine Washroom Parking	Coolant hose failure	Contaminated soil picked up and brought to UG shop in yellow bin
March 3, 2020	Hydraulic Oil	15	L	Mine Washroom Parking	Hydraulic hose failure	Contaminated soil picked up and brought to UG shop in yellow bin
March 4, 2020	Hydraulic Oil	60	L	E&I parking	Hydraulic hose failure	Operator shut down the loader and contain oil inside the affected zone. Spill was cleaned up and disposed into a yellow roll off bin
March 8, 2020	Compressor Oil	30	L	Whale Tail Pit 5130MSW01	Seal between the compressor and engine was leaking	Absorbent pad was disposed over the spill and the rest of the material scrap with a shovel in a Quatrex bag.
March 9, 2020	Hydraulic Oil	5	L	Road 25	The operator had some problem with the blade. He stopped to check and he saw a leak under the dozer.	Called the dispatch for repair. Spill was contained and contaminated soil picked up and disposed of appropriately in the yellow roll of bin
March 9, 2020	Hydraulic Oil	25	L	Whale Tail Pit	Quick attach on hydraulic hose failure	The operator stopped the engine right away and called the dispatch for the mechanic. Spill was contained and contaminated soil picked up and disposed of appropriately in the yellow roll of bin
March 10, 2020	Coolant	30	L	Mine Ops Parking at new camp	Coolant hose failure	Mechanic as been called to fix the hose. Absorbent pad was put over the spill. Contaminated soil brought to the yellow bin.
March 10, 2020	Hydraulic Oil	35	L	Whale Tail Pit	Equipment failure	Called the mechanic to check where the leak comes from and also to fix it and clean the spill. Spill was contained and contaminated soil picked up and disposed of appropriately in the yellow roll of bin
March 10, 2020	Coolant	74	L	Ring road	Coolant hose failure	Stopped the engine right away and called the dispatch to advise the mechanics. Spill was contained and contaminated soil picked up and disposed of appropriately in the yellow roll of bin
March 10, 2020	Hydraulic Oil	50	L	Whale Tail Pit	Equipment failure	Stopped the engine right away and called the dispatch for the mechanic. Spill was contained and contaminated soil picked up and disposed of appropriately in the yellow roll of bin
March 12, 2020	Hydraulic Oil	2	L	0-6' stockpile	Equipment failure	Spill was contained and contaminated soil picked up and disposed of in Sana quatrex bag
March 14, 2020	Diesel	50	L	Fountain tire shop	The nozzle popped out from the hose.	Close the valve right away and called the supervisor. Spill was contained and contaminated soil picked up and disposed of appropriately in the yellow roll of bin

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
March 17, 2020	Hydraulic Oil	20	L	FGL garage	While warming the haul-truck the rear axle start to leaked	Contaminated soil picked up and disposed of appropriately
March 18, 2020	Diesel	25	L	Underground Shop	The operator was going to fuel equipment and hit a toe on the floor and made a hole in the fuel truck tank on the left side .	Contaminated soil was scraped up and sent to Hazmat storage.
March 18, 2020	Hydraulic Oil	57	L	Sana Crusher	Hydraulic hose failure	Stop the engine right away and called the supervisor and the dispatch for mechanic. Contaminated soil was scraped up and sent to Hazmat storage.
March 18, 2020	Coolant	60	L	Whale Tail Phase 1.5109MSW05	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of to the contaminate bin.
March 19, 2020	Coolant	60	L	Whale Tail Phase 1	Equipment failure	Stopped the engine right away and called the dispatch for mechanic. Spill was contained and contaminated soil picked up and disposed of to the contaminate bin.
March 20, 2020	Hydraulic Oil	5	L	Pad E	Hydraulic hose failure	Stopped the engine and called the dispatch right away. Spill was contained and contaminated soil picked up and disposed of to the contaminate bin.
March 21, 2020	Coolant	50	L	Ore storage	Coolant hose failure	Contaminated soil was brought to the yellow bin located at the Hazmat area
March 22, 2020	Hydraulic Oil	5	L	Ore storage	Hydraulic hose failure	Contaminated soil was brought to the yellow bin located at the Hazmat area
March 22, 2020	Coolant	40	L	Haul truck parking	Radiator failure	Contaminated soil was brought to the yellow bin located at the Hazmat area
March 23, 2020	Compressor Oil	20	L	Whale Tail Pit 5109MSW15	Compressor oil / pressure valve defective	Contaminated soil was brought to the yellow bin
March 24, 2020	Hydraulic Oil	10	L	Haul truck Parking	The spill was from the cap of the hydraulic thank.	Contaminated soil was brought to the yellow bin
March 24, 2020	Diesel	10	L	Whale Tail Pit 5109MSW15	Diesel vent on top of fuel tank failed	Mechanic was called to repair vent. Contaminated soil was brought to the yellow bin
March 25, 2020	Hydraulic Oil	30	L	Whale Tail Pit 5123msw45	Equipment failure	Shovel was turned off and repaired. Contaminated soil was brought to the contaminated bin located at the Hazmat area
March 28, 2020	Hydraulic Oil	75	L	Whale Tail Pit	Hydraulic hose failure	Contaminated soil was brought to the yellow bin
March 28, 2020	Coolant	10	L	Whale Tail Pit	Blown brake cooler return hose	Contaminated material picked up and disposed of adequately
March 28, 2020	Hydraulic Oil	15	L	Whale Tail Pit, road 3	Equipment failure	Contaminated soil was brought to the yellow bin
March 29, 2020	Coolant	35	L	Haul Truck Parking	Equipment failure	Contaminated soil was brought to the yellow bin
March 31, 2020	Hydraulic Oil	80	L	Whale Tail Pit pattern 07	Equipment failure	Operator put absorbent pad to contain the spill. Contaminated soil was brought to the yellow bin

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
April 6, 2020	Hydraulic Oil	20	L	New maintenance shop	The hose from the hydraulic valve to steering came apart	Put absorbent pads on spill and replace faulty hose. Spill was contained, and contaminated soil picked up and disposed of appropriately in the petroleum waste bin.
April 6, 2020	Hydraulic Oil	25	L	Maintenance parking	A hydraulic hose was removed and not capped	Spill was contained, and contaminated soil picked up and disposed of appropriately in the petroleum waste bin. Hydraulic hose was replaced/re-installed
April 7, 2020	Diesel	10	L	Sana rip-rap pad	Breather malfunction on equipment and overflow	Spill was contained, and contaminated soil picked up and disposed of appropriately in the yellow bin. Equipment was repaired.
April 10, 2020	Hydraulic Oil	40	L	WRSF	Hydraulic oil leaking from O'ring seal	Spill was contained and contaminated soil pick up and disposed of appropriately in the petroleum bin
April 13, 2020	Hydraulic Oil	85	L	New Sana pad	Hydraulic hose failure	Stop engine, change defective hose and inspection of other hoses. Spill was contained, and contaminated soil picked up and disposed of appropriately in the petroleum bin.
April 13, 2020	Hydraulic Oil	48	L	Channel Road	Equipment failure	Contaminated soil and snow picked up and disposed of appropriately in the petroleum bin. Stop engine, clean up of the wheel and clean up of the snow
April 13, 2020	Contaminated Water	55	L	Camp Housekeeping Lift Station	The Sewage Truck Operator went to unload some sewage into the NewTerra Sewage Treatment plant when the Sewage plant operator noticed that there was no more water coming out in his system. Some Rocks coming from the Sewage truck clogged into the piping system. A few moments later someone reported that the housekeeping Grey water Lift Station was overflowing	STP Operator reported the issue to his supervisor and the Supervisor sent the sewage Truck immediately to the lift station and had his STP Operator with the assistance of the camp plumber fix the issue
April 13, 2020	Transmission fluid	20	L	Super Highway	Transmission line failure	Contaminated soil picked up and disposed of appropriately in the petroleum bin
April 14, 2020	Hydraulic Oil	25	L	5123MSW73	O'ring failure in the pump drive	Contaminated soil picked up and disposed of appropriately in the petroleum bin
April 14, 2020	Hydraulic Oil	5	L	Whale Tail Pit Hole # 2223	Equipment failure	Spill was contained and contaminated soil picked up and disposed of appropriately in a petroleum contaminated soil quatrex
April 20, 2020	Hydraulic Oil	75	L	SANA Seacan Laydown	Equipment failure	Engine was stopped and mechanic was called for repair. Contaminated snow picked up and disposed of appropriately.
April 25, 2020	Hydraulic Oil	5	L	IVR Hole # 2242	Equipment failure	Spill was contained and contaminated soil picked up and disposed of appropriately in a petroleum contaminated soil quatrex
April 25, 2020	Grease	NA	L	Kitchen	Supervisor reported a bad odor coming from the Floor near the kitchen office to the E&I Maintenance Supervisor.	The Maintenance Crew (Plumber&Carpenter) opened up the side box on the side of the kitchen module and that is when they observed the presence of grease on the ground under the Floor. They then cut a hole in the floor inside the kitchen office and found 1/2 inch of grease under the flooring and insulation.
May 6, 2020	Hydraulic Oil	5	L	WT Pit	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately in the petroleum bin
May 8, 2020	Hydraulic Oil	10	L	Phase 2 Pit	Hydraulic hose failure	Mechanics repaired equipment. Contaminated soil picked up and disposed of appropriately in the yellow bin

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
May 8, 2020	Hydraulic Oil	25	L	Road 7 and Phase 2 ramp	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately in the petroleum bin
May 9, 2020	Hydraulic Oil	30	L	Phase 1 Pit	Hydraulic hose failure	Mechanics repaired equipment. Contaminated soil picked up and disposed of appropriately in the petroleum bin
May 9, 2020	Hydraulic Oil	60	L	Phase 1 Pit	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately in the yellow bin
May 9, 2020	Hydraulic Oil	10	L	WT Pit	O'ring failure on bucket	Contaminated soil picked up and disposed of appropriately in the yellow bin
May 10, 2020	Hydraulic Oil	60	L	Phase 3 Pit	Hydraulic hose failure	Once spill was detected, drill was pulled to the side and engine was turned off. Contaminated soil picked up and disposed of appropriately in the petroleum bin
May 11, 2020	Hydraulic Oil	10	L	Phase 2 Pit	Hydraulic hose failure	The operator stop the engine right away and called the dispatch for the mechanic. Contaminated soil picked up and disposed of appropriately in the yellow bin
May 12, 2020	Hydraulic Oil	20	L	Phase 2 Pit	Equipment failure	Called the dispatch for mechanic and stopped the engine to minimize the spill. Contaminated soil picked up and disposed of appropriately in the petroleum bin
May 12, 2020	Hydraulic Oil	25	L	Phase 2 Pit	Equipment failure	Contaminated soil picked up and disposed of appropriately in the petroleum bin
May 13, 2020	Diesel	40	L	WT Pit	Diesel hose failure	Equipment repaired. Contaminated soil picked up and disposed of appropriately in the petroleum bin
May 13, 2020	Diesel	10	L	WT Pit	Unknown	Contaminated soil picked up and disposed of appropriately in the petroleum bin
May 14, 2020	Diesel	20	L	WT Pit	Fuel spill either from failure of backflow preventer or nozzle on fuel truck	Contaminated soil picked up and disposed of appropriately in the petroleum bin
May 15, 2020	Coolant	10	L	Office Parking	Equipment failure	Contaminated soil picked up and disposed of appropriately
May 15, 2020	Compressor Oil	5	L	WT Pit	Compressor oil started coming out of the bit	Drill was shut down, absorb pads were laid down and mechanic was called. Contaminated soil picked up and disposed of appropriately in the yellow bin
May 17, 2020	Hydraulic Oil	2	L	WT Pit	Little pin hole in rotation hose	Stopped drilling and called mechanics for repairs. Contaminated soil picked up and disposed of appropriately in the yellow bin
May 19, 2020	Hydraulic Oil	5	L	WT Pit	Hydraulic hose failure	Stopped drilling and called mechanics for repairs. Contaminated soil picked up and disposed of appropriately in the yellow bin
May 20, 2020	Coolant	70	L	Bottom Phase 3 Pit	Coolant hose failure	Stopped equipment and called mechanics for repairs. Contaminated soil picked up and disposed of appropriately in the yellow bin
May 21, 2020	Hydraulic Oil	15	L	WT Pit	O'ring failure	Contaminated soil picked up and disposed of appropriately in the yellow bin
May 22, 2020	Transmission Oil	45	L	Phase 3 Pit	Transmission hose failure	Stopped equipment and called mechanics for repairs. Contaminated soil picked up and disposed of appropriately in the yellow bin

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
May 28, 2020	Hydraulic Oil	4	L	Below 260-02	Hydraulic hose failure	Contractor shut off equipment and put down spill pads. Contaminated material disposed in quatrex bags
May 30, 2020	Hydraulic Oil	25	L	WT Pit	O'ring failure	Contaminated soil picked up and disposed of appropriately in the petroleum bin
June 4, 2020	Hydraulic Oil	35	L	VA260 SMP01	Hydraulic hose failure	Shut down equipment and place some absorbent pads. Contaminated material disposed in quatrex bags
June 4, 2020	Hydraulic Oil	60	L	Pad C	Steering hydraulic hose failure	Shut down equipment. Contaminated soil picked up and disposed of appropriately in the contaminated waste bin at the underground shop
June 8, 2020	Hydraulic Oil	30	L	Road 3 bottom of the ramp	Cap unscrew in engine compartment.	Replace cap. Spill has been picked up and the contaminated muck was brought to the yellow bin
June 17, 2020	Hydraulic Oil	40	L	SANA Seacan Laydown	The burned unit was parked out of service all along the winter, and while we moved the unit in the summertime, the oil inside the hydraulic hose leak on the ground.	Contaminated soil was picked up and disposed of in yellow petroleum bin
June 19, 2020	Waste oil	50	L	New maintenance	Tote got a hole in it from the pushing tool. in the waste oil container.	Spill was contained, and contaminated soil or snow picked up and disposed of in the landfarm
June 20, 2020	Hydraulic Oil	15	L	VT260 SMP01	Hydraulic hose failure	Place some absorbent pads. Contaminated material disposed in quatrex bags
June 21, 2020	Hydraulic Oil	40	L	Whale Tail pit Washroom parking	Hydraulic hose failure	Spill was contained, and contaminated soil or snow picked up and disposed of in the petroleum bin
July 1, 2020	Sewage	50	L	Sewage treatment plant	The main sewage line was blocked at the entrance of the STP, in order to find / fix the blockage, we had to un-flange the pipe. Even with the valves closed, the sewage in the line was released on the ground	Vacuum truck used to picked up most of the sewage on the ground. The remaining will be cleaned up with a excavator and disposed off adequately
July 2, 2020	Transmission Oil	35	L	Ring Road	Transmission oil failure	Stopped the engine and called the dispatch for repair. Spill was contained and contaminated soil picked up and disposed in the yellow contaminate bin.
July 3, 2020	Hydraulic Oil	10	L	Phase 2	Equipment failure	Stopped the engine and called the dispatch for repair. Spill was contained and contaminated soil picked up and disposed in the contaminated bin.
July 4, 2020	Engine Oil	3	L	Preshear 5109PSW81 near Phase two ramp	Engine hose failure	Mechanic was called to repair the equipment. Spill was contained and contaminated soil picked up and disposed in the yellow bin behind the U/G shop
July 4, 2020	Hydraulic Oil	75	L	Whale Tail Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed in the contaminated bin.
July 5, 2020	Hydraulic Oil	5	L	Phase 1	Transmission failure	Spill was contained and contaminated soil picked up and disposed in the contaminated bin.
July 6, 2020	Hydraulic Oil	80	L	Remuck 18 Underground ramp	Hydraulic hose failure	Spill pads were placed on ground to collect spilled material and disposed off adequately in quatrex contaminated material.

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
July 8, 2020	Motor Oil	5	L	5109PSW60 east of Phase2 area	Compressor hose failure	Engine was shut down and mechanic put absorb pads on the ground. Spill was contained and contaminated soil picked up and disposed in the yellow contaminated bin behind the hazmat area.
July 8, 2020	Hydraulic Oil	10	L	5116MSW16 (Phase 2)	O'ring failure	Operator shut off engine to limit he spill. Spill was contained and contaminated soil picked up and disposed in the contaminated bin.
July 10, 2020	Diesel	50	L	Tire check for LHT at AMQ	Fuel tank cracked	Maintenance to complete repairs. Spill was contained and contaminated soil picked up and disposed in the contaminated bin.
July 11, 2020	Diesel	5	L	near fountain tire shop	Fuel hose loosen	Put absorbent pads on the ground and tight the loosen collar. Spill was contained and contaminated soil picked up and disposed in the waste contaminated bin.
July 12, 2020	Hydraulic Oil	85	L	Amaruq pit Phase 2	Hydraulic hose failure	Operator shut off engine to limit he spill. Spill was contained and contaminated soil picked up and disposed in the contaminated bin.
July 13, 2020	Hydraulic Oil	50	L	LA290	Hydraulic hose failure	Used spill kit. Spill was contained and contaminated soil picked up and disposed in the contaminated bin.
July 13, 2020	Hydraulic Oil	90	L	Phase 3	Equipment failure	Operator went to a safe area and shut off engine to limit he spill. Spill was contained and contaminated soil picked up and disposed in the contaminated bin.
July 17, 2020	Diesel	40	L	Whale Tail pit pattern 5123RAW53	Fuel breather blocked	Spill was contained and contaminated soil picked up and disposed in the contaminated bin.
July 22, 2020	Hydraulic Oil	1	L	LA290 SMP01	Hydraulic oil on the ground after hose change	Spill was contained and contaminated rock was cleaned up and disposed of appropriately in quatrex bag in underground service dome
July 22, 2020	Hydraulic Oil	75	L	LA290 face	Hydraulic hose failure	Spill was contained and contaminated soil was disposed of appropriately In the contaminated soil bin
July 26, 2020	Hydraulic Oil	4	L	RMK18	Equipment failure	Spill was contained and spill pads disposed of properly in the quatrex bag at service dome
July 29, 2020	Hydraulic Oil	10	L	north of pattern 5116MSW54	Hydraulic hose failure	The engine was shut down immediately and mechanic was called to repair hose. Spill was contained and contaminated soil picked up and disposed in the yellow contaminated bin.
July 30, 2020	Hydraulic Oil	40	L	5109MSW45	O'ring failure	Equipment was stopped and mechanics went and changed the O'ring. Spill was contained and contaminated soil picked up and disposed in the yellow contaminated bin.
July 30, 2020	Diesel	10	L	LHT washroom pad	Fuel tank leaking	Spill was contained and contaminated soil picked up and disposed off adequately
August 1, 2020	Transmission Oil	80	L	WT Pit Phase 2	Equipment failure	Equipment was stopped. Spill was contained and contaminated soil picked up and disposed appropriately.
August 1, 2020	Diesel	10	L	Explo Camp MTU Genset Fuel Tank	The Fuel Tank was overfilled by the fuel truck operator and with the increase of temperature the pressure pushed the fuel upwards out from the tank vent	Worker picked up some absorbents to contain the spill and pumped some of the fuel into the Lube Truck to reduce the fuel in the tank. Spill was contained and contaminated soil picked up and disposed in the contaminated bin.

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
August 3, 2020	Hydraulic Oil	40	L	WT Pit Phase 2	Hydraulic oil failure	Equipment was stopped. Spill was contained and contaminated soil picked up and disposed appropriately.
August 4, 2020	Transfer case Oil	32	L	VT-260S access	Scoop lost a front right wheel	Spill was contained, and contaminated soil picked up and disposed of appropriately in the underground contaminated bin. Spill pads were placed on ground to collect spilled material.
August 6, 2020	Diesel	40	L	Whale Tail Pit	Tank filled to the max capacity and fuel was overflowing by the top vent of the fuel tank .	Put absorbent to contain the spill and advise pit supervisor. Spill was contained and contaminated soil picked up and disposed appropriately.
August 10, 2020	Drilling Oil	40	L	Road 7	Worker was moving palette of rock drill oil from warehouse to storage area and 2 pails fall off the palette.	Operator stop the loader. Absorbent pads and spill kit use to containment the spill. Spill was clean and scrap with loader. Spill was contained and contaminated soil picked up and disposed in the contaminated bin.
August 12, 2020	Engine Oil	75	L	Phase 3 Pattern 5130MSW15	Engine hose failure	Mechanic was call to fix hose. LOA 19 was send to pick-up the contaminated muck, the contaminated soil was brought to the yellow bin at the shop.
August 15, 2020	Hydraulic Oil	10	L	WT Pit Phase 2	Hydraulic hose failure	Operator turned off the machine and called dispatch for repair. Spill was contained and contaminated soil picked up and disposed in the contaminated bin.
August 19, 2020	Hydraulic Oil	40	L	VT260S RMK01 - WT Pit	Hydraulic hose failure	Contaminated spill pads picked up and disposed of properly in quatrex tote
August 23, 2020	Hydraulic Oil	20	L	Super highway stockpile	Hose on the hammer got loose and leaked.	Contaminated soil picked up and disposed in yellow bin behind the shop
August 24, 2020	Hydraulic Oil	25	L	Phase 2	Brake hose failure	Stopped the engine and called the dispatch for the mechanic. Contaminated soil picked up and disposed in yellow bin
August 24, 2020	Hydraulic Oil	70	L	Phase 2 in Pattern 5109MSW47	Cylinder brake hydraulic hose failure.	The spill was contained, and contaminated soil picked up and disposed of appropriately
August 25, 2020	Hydraulic Oil	20	L	Phase 2 (5109MSW47)	Hydraulic hose O'ring failure.	The spill was contained, and contaminated soil picked up and disposed of appropriately in the yellow bin
August 25, 2020	Hydraulic Oil	40	L	Phase 2 Pattern (5109MSW47)	Hydraulic hose O'ring failure.	Contaminated material disposed off adequately in the yellow bin
August 25, 2020	Hydraulic Oil	20	L	Bottom Phase#3 ramp	Hydraulic hose failure	Equipment stopped and contaminated material disposed off adequately in the yellow bin at the underground shop
August 26, 2020	Coolant	2	L	PATTERN 5123MSW81 next to hole # 2109	Coolant hose failure	The worker turned off engine immediately. Contaminated material disposed off adequately

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
August 28, 2020	Coolant	1	L	5102msw22	Coolant hose failure	Equipment stopped and put absorbent pads. The spill was contained, and contaminated soil picked up and disposed of appropriate yellow bin behind mechanic shop.
September 1, 2020	Hydraulic Oil	40	L	Road 7	Hydraulic hose failure	Equipment was stopped and mechanic called. Contaminated material was disposed of adequately in the yellow bin.
September 1, 2020	Hydraulic Oil	8	L	PAD 5B	Hydraulic oil tote was punctured by equipment	Tote was turned over to prevent more oil from leaking out, spill pads were used to clean up the oil and the contaminated material was removed and adequately disposed of in the petroleum bin
September 2, 2020	Hydraulic Oil	15	L	Pattern:5109msw67	Hydraulic hose failure	Engine was stopped, absorbent pads were used to clean spill and contaminated material was adequately disposed of. In the yellow bin by the mechanic shop.
September 8, 2020	Hydraulic Oil	5	L	Whale Tail Dumb Ramp	Hydraulic hose failure on grader	Operator stopped equipment, spill was cleaned up and contaminated material was adequately disposed of.
September 8, 2020	Coolant	15	L	Whale Tail (Phase 1)	Coolant leak at the back of the machine	Operator stopped equipment, spill was cleaned up and contaminated material was adequately disposed of.
September 8, 2020	Hydraulic Oil	70	L	IVR	Equipment failure	Operator stopped equipment, spill was cleaned up and contaminated material was adequately disposed of.
September 10, 2020	Coolant	20	L	Whale Tail Pit Phase 2 Ramp	Equipment failure	Loader was moved out of the way and shut off. Leak was repaired and the contaminated material was picked up and adequately disposed of.
September 17, 2020	Hydraulic Oil	1	L	RP320 face	Hydraulic hose failure	Hydraulic hose was repaired, the spill was contained and contaminated material was properly disposed of in a quatrex bag at the underground service dome.
September 24, 2020	Hydraulic Oil	15	L	Phase 1 pattern (5102MSW24)	Hydraulic hose failure	Operator stopped equipment, spill was cleaned up and contaminated material was adequately disposed of.
September 28, 2020	Coolant	45	L	Phase 3	Coolant hose failure	Material disposed of in the yellow bin
September 30, 2020	Diesel	30	L	Whale Tail Pit Phase 2	While refueling a drill, the fuel hose broke at a splice and caused fuel to spill onto ground	The operator hit the emergency shutoff, the proper clamps were installed on the hose to prevent another spill from occurring. Contaminated material was disposed of in the yellow bin behind the underground shop.
October 2, 2020	Hydraulic Oil	70	L	5102MSW38	Hydraulic oil valve failure	Contaminated material was cleaned up and put into contaminated soil bin.
October 4, 2020	Engine Oil	4	L	Phase 3, Pattern 5116MSW56 south east of the pattern	Compressor slowly leaking	Absorbent pads were placed on the spill beneath the compressor. The leak was repaired and the contaminated material was disposed of in the yellow bin.
October 5, 2020	Diesel	40	L	HTR Parking AMQ	Overflow while fueling equipment	Flow from the nozzle was stopped and contaminated material was cleaned up and adequately disposed of.

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
October 5, 2020	Preston	10	L	E&I parking	Equipment failure	Contaminated material was cleaned up and adequately disposed of.
October 7, 2020	Diesel	30	L	Pit Parking	Equipment failure	Contaminated material was cleaned up and adequately disposed of.
October 9, 2020	Diesel	60	L	UG fuel tank	Overfilling of fuel tank	Contaminated material was cleaned up and adequately disposed of.
October 10, 2020	Hydraulic Oil	65	L	Whale Tail Pit	Hydraulic oil hose failure	Contaminated material was cleaned up and adequately disposed of.
October 15, 2020	Hydraulic Oil	83	L	61BOL01	Hydraulic oil hose failure	Contaminated material was cleaned up and adequately disposed of.
October 16, 2020	Hydraulic Oil	24	L	Underground	Hydraulic oil hose failure	Contaminated material was cleaned up and adequately disposed of.
October 16, 2020	Coolant	10	L	Haul Truck Parking	Coolant hose failure	Contaminated material was cleaned up and placed in yellow bin.
October 19, 2020	Diesel	50	L	HTR11	Equipment failure	Contaminated material was cleaned up and adequately disposed of.
October 19, 2020	Hydraulic Oil	25	L	Underground	Hydraulic oil hose failure	Contaminated material was cleaned up and placed in yellow bin.
October 19, 2020	Brake fluid	30	L	Whale Tail Pit	Brake line failure	Contaminated material was cleaned up and adequately disposed of.
October 19, 2020	Hydraulic Oil	50	L	Whale Tail Pit	Hydraulic oil hose failure	Contaminated material was cleaned up and placed in yellow bin.
October 20, 2020	Hydraulic Oil	20	L	IVR Pit	Hydraulic oil hose failure	Contaminated material was cleaned up and placed in yellow bin.
October 22, 2020	Hydraulic Oil	17	L	Underground	Rock broke hydraulic hose line	Contaminated material was cleaned up and adequately disposed of.

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
October 23, 2020	Hydraulic Oil	90	L	WRSF	Hydraulic oil hose failure	Contaminated material was cleaned up and adequately disposed of.
October 25, 2020	Hydraulic Oil	80	L	Underground	Hydraulic oil hose failure	Spill was contained and contaminated spill pads were disposed of in a quatrex bag.
October 26, 2020	Hydraulic Oil	50	L	Ring road	Hydraulic oil hose failure	Contaminated material was put in yellow bin.
October 29, 2020	Hydraulic Oil	20	L	Whale Tail Pit	Hydraulic oil hose failure	Contaminated material was put in yellow bin.
November 7, 2020	Hydraulic Oil	50	L	SANA Heavy Equipment Parking	Hydraulic hose failure	Contaminated material was removed and adequately disposed of.
November 8, 2020	Hydraulic Oil	10	L	IVR Pit	Hydraulic hose failure	Contaminated material was removed and put in the yellow bin.
November 12, 2020	Diesel	10	L	WTHR KM 142	Fuel line failure	Spill pads were used to contain the spill. Contaminated material was removed and adequately disposed of in the yellow bin.
November 12, 2020	Sewage	5	L	Sewage Treatment Plant	Pipe broke during emptying of sewage truck. The pipe broke due to it being frozen then thawed with a torch.	Contaminated material was adequately disposed of.
November 13, 2020	Hydraulic Oil	40	L	Whale Tail Pit	Hydraulic hose failure	Contaminated material was removed and put in the yellow bin.
November 14, 2020	Hydraulic Oil	8	L	Underground Near Bay #3	Hydraulic hose failure	Contaminated material was disposed of in a quatrex bag
November 18, 2020	Hydraulic Oil	55	L	IVR Ring Road	Hydraulic hose failure	Contaminated material was removed and put in the yellow bin.
November 20, 2020	Transmission Oil	85	L	Winter Parking	Broken O'ring on transmission oil filter	Contaminated material was removed and put in the yellow bin.
November 20, 2020	Contaminated Water	60	L	Wing 12 of Camp	Broken pipe.	Contaminated material was adequately disposed of.
November 20, 2020	Hydraulic Oil	50	L	Whale Tail Pit	Steering cylinder leak	Contaminated material was removed and disposed of in the yellow bin.
November 22, 2020	Oil	40	L	Whale Tail Pit	Cap not placed on line during maintenance, oil from in the line spilled onto the ground.	Contaminated material was removed and disposed of in the yellow bin.
November 28, 2020	Hydraulic Oil	90	L	IVR Pit	Hydraulic hose failure	Contaminated material was removed and disposed of in the yellow bin.

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
November 30, 2020	Hydraulic Oil	20	L	Whale Tail Pit	Hydraulic hose failure	Contaminated material was removed and disposed of in quatrex bags.
December 5, 2020	Coolant	20	L	Explo Camp Road	Coolant hose clamp failure	Spill pads were used to contain the spill. The contaminated soil and spill pads were adequately disposed of.
December 5, 2020	Transmission oil	40	L	Underground	Hose failure	The spill was contained using spill pads and the contaminated material was disposed of in a quatrex bag.
December 7, 2020	Hydraulic Oil	25	L	WRSF	Hydraulic hose failure	Contaminated material was adequately disposed of.
December 14, 2020	Hydraulic Oil	3	L	SANA Garage	Hydraulic hose failure	Spill pads were used to contain the spill. Contaminated material was removed and adequately disposed of.
December 15, 2020	Coolant	35	L	Whale Tail Pit View Point	Coolant hose failure	Contaminated material was disposed of in the yellow bin.
December 15, 2020	Diesel Fuel	45	L	IVR Waste Dump	Fuel line filter failure	Contaminated material was disposed of in the yellow bin.
December 17, 2020	Coolant	60	L	Winter Parking	Broken radiator	Contaminated material was disposed of in the yellow bin.
December 18, 2020	Engine Oil	30	L	Whale Tail Pit	Breather on drill engine froze causing engine oil leak	Contaminated material was adequately disposed of.
December 21, 2020	Hydraulic oil	40	L	Washroom Parking	Equipment failure	Spill pads were used to contain the spill. Contaminated material was adequately disposed of.
December 5, 2020	Coolant	20	L	Construction Pad H	Hydraulic hose failure on equipment	The operator stopped the equipment right away and called the supervisor. Spill was contained and contaminated soil picked up and disposed of appropriately in the roll-off bin
December 5, 2020	Transmission Oil	40	L	Beside wing 8 explo	Hydraulic tank oil cap pop-off and release a splash of oil on the snow	Operator call the team leader right away and stop the loader. Call the loader 6 operator to remove the spill as soon as possible. Contaminated soil picked up and disposed of appropriately
December 7, 2020	Hydraulic Oil	25	L	WRSF	Equipment failure	Called supervisor and shut off the engine. Spill was picked up and brought to the yellow bin
December 14, 2020	Hydraulic Oil	3	L	WTHR KM 121	Equipment failure	Service truck was sent to fix the leak. Contaminated soil picked up and disposed of appropriately
December 15, 2020	Coolant	35	L	Waste dump parking	Coolant leak on the engine	Shut the truck down and called dispatch to inform the service shop of the breakdown and to fix the haul truck. Contaminated soil picked up and disposed of appropriately at the MBK tailings

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
December 15, 2020	Diesel Fuel	45	L	Sana parking	During a cold start of the truck, the wheel seals did not replace, which caused the hydraulic oil present in the hose to flow	Spill was picked up and brought to the yellow bin
December 17, 2020	Coolant	60	L	Whale Tail Pit	Quick attach hose loose	Stop Equipment and called mechanic to get it repair. Spill was picked up and brought to the yellow bin
December 18, 2020	Engine Oil	30	L	Whale Tail Pit	Hydraulic hose fan failure	Contaminated soil picked up and disposed of appropriately
December 21, 2020	Hydraulic oil	40	L	WTHR KM 123	Fan belt broken and cut coolant line	Absorbent pads used to contain the spill. Contaminated soil picked up and disposed of appropriately

7.2 LANDFARM MEADOWBANK

The complete 2020 Landfarm Report is provided in Appendix 30. A summary of activities is provided here.

Meadowbank's first landfarm (Landfarm 1) was constructed in 2012 and located on the north-west side of the South Tailings Cell within the Tailings Storage Facility. Since this area was planned to eventually become flooded with reclaim water, Agnico constructed a new landfarm (Landfarm 2) in 2016, in order to continue the treatment of contaminated soil. Landfarm 2 is located on the north east side of the South Tailing Cell, north of the Central Dike and contaminated soil were disposed in Landfarm 2 since 2017. In 2019, the Landfarm 1 area became flooded by reclaim water and is not active anymore. No soil were added to the Landfarm 1 since the end of 2016, and thus only Landfarm 2 ("the landfarm") is in operation.

Based on surveys conducted by Meadowbank's Engineering Department the total volume of the landfarm 2 in January 2020 was 4,125 m^3. It is estimated that between January 2020 and the end of December 2020, 577.5 m^3 of soil were added to landfarm 2 from excavation of spills around the Meadowbank and Whale Tail sites. Total landfarm 2 volume at the end of December 2020 was 4,702.5 m^3 with a remaining estimated capacity of 6,742.5 m^3.

No landfarm soil sampling was conducted in 2019, 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. Since landfarm additions and removals occurred each year, piles were mixed, and sampling locations are not consistent, year-over-year trends were not assessed. No fine material was sampled in 2017-2020. No confirmatory sampling of soil for removal from the landfarm was conducted and no soil was removed, due to low staff associated to COVID-19.

Visual inspections (37 times) in 2020 indicated that the landfarm berm and pad appear to be structurally intact, and no maintenance was required. No ponded water or seepage from the landfarm area was observed, so no water quality monitoring was required.

Nutrient additions in the form of sewage sludge occurred in August 2020, as detailed in the LDMP. Total volume of sludge added to the landfarm is 6.8 cubic meters. Aeration of the material by the construction of windrow was also performed.

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/WTHR. A summary of spills occurring in 2020 including those sent to the landfarm are provided in Table 7-2 to 7-5.

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**

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:

• Hazardous Materials Management Plan, Version 6, March 2020 (Appendix 55);

• Spill Contingency Plan, Version 13, March 2021 (Appendix 27);

• Emergency Response Plan, Version 16, March 2021 (Appendix 31);

• Oil Pollution Emergency Plan, Version 13, March 2021 (Appendix 32);

• OMS Manual for TSF, Version 9, February 2019 (Appendix 51 of the 2018 Annual Report);

• OMS Manual for the dewatering dikes, Version 8; February 2019 (Appendix 51 of the 2018 Annual Report).

Table 7-2 and 7-3 shows all spills that occurred on site, in Baker Lake and along the AWAR in 2020. Spills on the AWAR were between 5L and 30L and were due to mechanical issues (for example - hydraulic hoses failure) or accidents.

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 requested 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.

Teleconferences were held on May 1st and 7th in 2020 to discuss the AWAR and COVID-19 protocols. No significant spills occurred in 2020 and therefore possible accidents and malfunctions were not specifically discussed during the teleconference in 2020. On May 8th, 2020 Agnico Eagle did Facebook posts on the AWAR procedure and the community can access the procedure via the website www.aemnunavut.ca/community/roads. Due to COVID-19 restrictions an Open House was not held in Baker Lake in 2020.

As part of the International Cyanide Management Code (ICMC), Agnico discussed with the community the cyanide shipping and transportation along the AWAR. In 2020, teleconferences were held only in Rankin Inlet and Baker Lake to present the 2020 Sealift Season schedule. Due to COVID-19 exceptional circumstances, Agnico Eagle was not able to hold the usual community information meetings in person. During the teleconference, options for the 2020 Sealift Season were presented, which were carefully analyzed to ensure minimal impact on the surrounding community. Additionally, update on how Agnico will notify the community was presented. Furthermore, due to COVID-19 pandemic and community restrictions there were no stakeholder and public meetings held in Chesterfield Inlet on the 2020 Sealift Season schedule. However, Agnico Eagle representatives remained connected via email or teleconference with the Chesterfield Hamlet representatives. In 2021, depending on how COVID-19 pandemic evolves, Agnico Eagle will resume Sealift Season in consultation with DFO and affected communities via teleconference with Community Liaison Officers (CLOs) support or host in-person information meetings.

To prevent and ensure accidents and malfunctions are dealt appropriately the following activities were held in 2020:

- 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 2020.

- A mock spill exercise was completed on September 26, 2020 at the Baker Lake Marshalling Facility. The scenario was that while inspecting the diesel fuel line from the offloading vessel to the OHF, a leak was noticed coming from a perforation in the pipe near the shore of Baker Lake. The mock spill exercise report can by found in Appendix L of the Spill Contingency Plan (Appendix 27).

SECTION 8. MONITORING

As required by NWB Water License 2AM-MEA1530 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-WTP1830 Schedule B, Item 19: ***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.

Given the elevated number of Certificates of Analysis related to both Meadowbank and Whale Tail projects in 2020, Agnico will provide them on request. The certificates of Analysis is detailed as follow:

- 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; and.
- sample and QAQC results.

For all samples collected under the Meadowbank Water Quality and Flow Monitoring Plan, trending was added starting in 2013 up to 2020. The same is also compiled for Whale Tail starting in 2018 up to 2020.

8.1 CORE RECEIVING ENVIRONMENT MONITORING PROGRAM (CREMP)

8.1.1 Meadowbank Site[*]

The CREMP 2020 report can be found in Appendix 33. 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 33 for an exhaustive comprehension of the program and results for 2020. Agnico will also refer the reader to Table ES-1 of the CREMP 2020 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 water quality, sediment chemistry, and aquatic producers—both primary producers (phytoplankton) and secondary producers (benthic invertebrate community)—that may be associated with mine development activities. Changes are identified using a temporal/spatial trend assessment that includes applying quantitative decision criteria (i.e., early warning triggers and action thresholds) to facilitate making timely and objective management decisions and taking action. CREMP results are integrated annually into the Aquatic Ecosystem Monitoring Program (AEMP) for holistic environmental management and decision making.

Meadowbank Study Lakes

There are 9 sampling areas included in the Meadowbank CREMP. Third Portage Lake East Basin and North Basin (TPE and TPN), Second Portage Lake (SP), and Wally Lake (WAL) are the NF areas

[*] TSM- Biodiversity Conservation

monitored annually for changes related to operations at the Meadowbank mine and mill. Tehek (TE), the South Basin of Third Portage Lake (TPS), and Tehek far-field (TEFF) are monitored only if changes are detected upstream at the NF locations consistent with the strategy outline in Section 2.2.3 of the report in Appendix 33. Two reference areas are shared for the Meadowbank and Whale Tail Pit programs: Inuggugayualik Lake (INUG) and Tasirjuaraajuk Lake (aka Pipedream Lake [PDL]). INUG has been the core reference area since formal monitoring began in 2006. PDL was added to the Meadowbank CREMP in 2009. Refer to map provided in the 2020 CREMP Report for location.

Key findings for 2020:

Water Quality

Full water quality monitoring (i.e., limnology and water chemistry) was completed in March, May, July, August, and September according to the monitoring strategy for the program. Limnology profiles were taken at the Near-Field (NF) areas—Third Portage Lake sampling areas, (TPN, TPE), Second Portage Lake (SP), and Wally Lake (WAL)—in the winter months when ice conditions were safe (January, February, April, November, and December), to verify the absence of anomalous changes in water quality (e.g., conductivity) attributable to site-related activities.

Similar to previous years, the before-after-control-impact (BACI) analyses identified statistically significant mine-related changes relative to baseline/reference conditions at one or more NF areas for conductivity (TPN, TPE, SP, WAL); hardness (TPN, TPE, SP, WAL); total dissolved solids (TPE, SP, WAL); alkalinity (TPN, TPE, SP); and, major cations (i.e., calcium and magnesium [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 changes to water quality are mine related, 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. Changes were detected relative to baseline/reference conditions for a few new parameters in 2020: reactive silica (WAL), total and dissolved silicon (SP), and dissolved zinc (TPN, TPE, and SP). However, the changes detected in these parameters are minor and do not appear to be mine-related. Consistent with previous reporting cycles, there were no trigger exceedances in 2020 for any water quality parameters with CCME water quality guidelines, including metals (with the exception of dissolved zinc). In the context of the assessment framework outlined in the Final Environmental Impact Statement (FEIS), the magnitude of potential effect on water quality in each of the near-field lakes in 2020 was considered low (i.e., less than 1X the CCME WQGs) and consistent with the original predictions. Routine water quality monitoring is recommended for 2021, to continue tracking the changes noted above.

Sediment Chemistry

The 2020 sediment program focused on NF and reference areas only and consisted of the routine grab sampling (particle size, total organic carbon [TOC], and organics analysis on the top 3–5 cm of sediment) and a sediment coring program (metals analysis on the top 1.5 cm of sediment).

Sediment core metals for which the 2020 mean exceeded the trigger value at the NF areas were formally assessed in the statistical BA model to assess whether concentrations are increasing over time. As in previous years, the mean sediment concentrations exceeded the trigger for arsenic at WAL, for chromium at TPE, and for zinc at SP and TPE. In all four of these cases, mean concentrations have decreased from 2019, except for arsenic at WAL, which has decreased from the 2018 sediment coring mean. The conclusions of previous targeted studies are confirmed by the 2020 results: (a) there are no temporal changes in sediment arsenic concentrations at WAL attributable to activities at the mine, and

(b) there have been temporal changes in sediment chromium concentrations at TPE which are attributable to activities at the mine but have stabilized since 2013 and current conditions do not pose risks to the benthos at TPE. The observed patterns of sediment zinc concentrations at SP and TPE appear to be due to natural spatial heterogeneity. Other sediment metals from coring samples and grab sampling results for organics analysis showed no mining-related temporal or spatial patterns. Verification of the observed trends using sediment grabs will be conducted in 2021.

Phytoplankton Community

Phytoplankton community sampling was completed at the same time as the water chemistry sampling program in 2020. Based on the BACI statistical analysis of the data, phytoplankton biomass was lower at TPE (26% decrease) and TPN (23% decrease) relative to reference/baseline conditions (these were not statistically significant). The apparent decreases may have more to do with a relatively higher biomass at the INUG reference area than with lower biomass at TPE or TPN. This is corroborated by nutrient concentrations in both lakes being in the range of what is typically observed and seasonal patterns being similar to the PDL reference area. Considering these lines of evidence, there is no indication that mining operations are systematically affecting primary productivity in the NF areas. BACI analysis of the data also showed that phytoplankton taxa richness was significantly higher at TPN (17% increase) relative to reference/baseline conditions, but the effect size was below the 20% trigger level. The trends in phytoplankton biomass and richness will be reviewed again in 2021.

Benthos Community

The only statistically significant change to the benthic invertebrate community at Meadowbank identified by the 2020 BACI assessment was an apparent reduction in total abundance for the four-year (2017 to 2020 [39%; p=0.08]) time period at TPE relative to baseline/reference conditions. That result, however, appears to be due mainly to particularly high abundance at INUG across recent years relative to its baseline years, rather than due to actual reductions at TPE. Absolute total abundance at TPE in 2020 (~3,200 organisms/m^2) was stable relative to the range of values dating back to 2012 (2,220–3,100 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. 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. Monitoring of the observed trends will be continued in 2021.

Baker Lake

CREMP monitoring at Baker Lake started in 2008. Important mine-related activities in Baker Lake include barge/shipping traffic and general land-based activities associated with the tank farm area. Approximately double the usual number of barge shipments arrived at BPJ in 2018 to support construction activities for the Whale Tail Project. The number of barge shipments remained high in 2019 and decreased slightly in 2020. No spills of fuel or any other materials were reported in 2020 that reached the Baker Lake receiving environment.

Chemistry

Sampling was conducted at two NF (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. Refer to map provided in the 2020 CREMP Report for location. In 2020, the mean concentrations for total and bicarbonate alkalinity exceeded their respective triggers at all three stations, BAP, BBD and BPJ. The mean concentrations of DOC only exceeded the trigger at BPJ. These parameters are naturally variable and are generally correlated with higher conductivity and more-saline waters. As such, it is likely that the exceedances for alkalinity and DOC are transient. This is further corroborated by the observed increase in these parameters at the control area (BAP) and other sites (e.g., Meadowbank study area lakes).

Changes in sediment chemistry data are evaluated on a 3-year cycle as part of the sediment coring program (coinciding with the EEM cycle). Coring was completed in August 2020 and the sediment core metals for which the 2020 mean concentrations exceeded their respective trigger values at Baker Lake were formally assessed using a statistical BA model to assess whether concentrations are increasing over time. The only metal exceeding the trigger was for arsenic at BPJ (trigger = 7.6; mean = 17.1 mg/kg dw). Arsenic is particularly enriched in sediments throughout the study area lakes, therefore the 2020 results are consistent with previous years. 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.

Concentrations measured in the various lakes in 2020 were comparable to results reported in previous annual monitoring reports. Other sediment metals from coring samples and grab sampling results for organics analysis showed no mining-related temporal or spatial patterns. Monitoring in 2021 will follow the scope and schedule of the CREMP Design Plan.

Biological Communities

The phytoplankton and benthos communities in Baker Lake have not exhibited any changes attributable to Agnico Eagle's activities in Baker Lake. No follow-up management actions are required for 2021 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 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;***

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- ***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.

The CREMP 2020 report can be found in Appendix 33. 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 33 for an exhaustive comprehension of the program and results for 2020. Agnico will also refer the reader to Table ES-2 of the CREMP 2020 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. Data analysis for Whale Tail study areas follows the same methods and framework as Meadowbank. Below are some of the important changes that occurred for the Whale Tail CREMP in 2020: Refer to 2020 CREMP Report for sampling location.

- 2020 was the second full year where most Whale Tail study area lakes were fully under an impact designation and potentially under the influence of mine activities. Whale Tail South (WTS) and Mammoth Lake (MAM) transitioned from control to impact in 2018 after the onset of construction activities on the Whale Tail Dike. The status of Lake A20, Lake A76, and Lake DS1 switched to impact in January 2019, while Nemo Lake (NEM) transitioned after July 2019.

- With two years of after data, 2020 was the second year of formal statistical analysis using the Before/After Control/Impact (BACI) framework at the Whale Tail study area lakes. As usual, the statistical analyses were complemented with time-series plots to facilitate the visual exploration of temporal and spatial trends in chemistry parameters and biological metrics.

- Water chemistry results were screened against early warning triggers and action thresholds (where available) specific to the Whale Tail study area lakes (most were developed in 2019; strontium was updated in 2020).

- Water chemistry data (monthly mean concentrations for each parameter) from Whale Tail South and Mammoth Lake were compared to monthly water quality predictions in the Whale Tail FEIS.

Water Quality

The Whale Tail water quality monitoring was completed alongside the Meadowbank water quality monitoring program. Full monitoring events (i.e., limnology and water chemistry) were completed in March, May, July, August, and September according to the monitoring strategy for the program. Limnology profiles were taken at the NF areas—Whale Tail South (WTS), Mammoth Lake (MAM), and Nemo Lake (NEM)—in the winter months when ice conditions were safe (January, February, April, November, and December), to verify there were no anomalous changes in water quality (e.g., conductivity) attributable to site-related activities. Limnology profiles were also collected in MF area Lake A20 in November and December. Furthermore, additional limnology profiles were collected targeting spatial-temporal trends in MAM to better characterize ongoing changes in water quality in Mammoth Lake.

Changes to baseline conditions were expected with the construction activities that are ongoing for the project. The ultra-oligotrophic Whale Tail study area lakes have a long ice cover season and tended to exhibit fairly stable conditions over the baseline sampling period. Consequently, when interpreting time series plots to examine spatial-temporal trends in water quality, the signal of development-related inputs was expected to be easily observed relative to the low noise levels of the baseline period.

Mining-related changes in water quality were assessed by screening the yearly mean concentrations at each monitoring area against the trigger/threshold values; parameter/area combinations exceeding their respective trigger value were subject to formal BACI analysis to determine if the changes were statistically significant. Key results for parameters with yearly means exceeding the trigger for at least one NF area were as follows:

- Ionic Compounds – trigger exceedances were statistically significant for conductivity, hardness, total dissolved solids (TDS), alkalinity, calcium, magnesium, potassium, and sodium. Except for alkalinity, these statistically significant increases also extended to MF area Lake A76.

- Nutrients – trigger exceedances were statistically significant for total Kjeldahl nitrogen (TKN) at NF areas. Trigger exceedances were statistically significant for total phosphorous (TP), total organic carbon (TOC) and dissolved organic carbon (DOC) at WTS, likely the result of inputs from flooded terrestrial habitats following impoundment and dewatering inputs from WTN. Trigger exceedances were also statistically significant for TOC and DOC at MAM and Lake A20.

- Metals/metalloids – trigger exceedances were statistically significant for total and dissolved lithium at NF areas WTS, MAM, and NEM (total only) and for total and dissolved silicon at MAM.

Similar to results seen over the years at the Meadowbank study lakes, the trends identified above represent increases above baseline/reference conditions only; except for total phosphorus, none of the analytes with concentration increases above trigger values that were statistically significant in 2020 have CCME effects-based guidelines for the protection of aquatic life. FEIS predictions for WTS and MAM were exceeded for ammonia, nitrate, total phosphorus (only WTS), sulphate, total alkalinity, TDS, and several ionic compounds and total metals in one or more sampling events. Despite early warning triggers and FEIS predictions being exceeded in 2020, the absolute concentrations of these parameters remain low and far lower than concentrations associated with adverse effects to aquatic life. Routine water quality monitoring will continue in 2021 to track emerging spatial and temporal trends.

Phytoplankton Community

Phytoplankton community sampling was completed at the same time as the water chemistry sampling program in 2020. Phytoplankton communities vary naturally throughout the year in total biomass (and density) and community composition (taxa richness). The main 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 increasing metals concentrations would be expected to cause lower biomass and taxa diversity.

Phytoplankton biomass was highly variable in 2020. Lower biomass was reported at WTS (27% decrease) and MAM (35% decrease) and higher biomass at A20 (29% increase) and NEM (48% increase) relative to control/baseline conditions. BACI statistical analysis of the data indicated that none of the apparent changes in total biomass were statistically significant. Similar to the patterns observed in Meadowbank study area lakes over the years, the apparent decreases in biomass seem more related to the relatively higher biomass at INUG rather than lower biomass at WTS or MAM. Further, the changes observed to water quality (e.g., increased total phosphorus) would have had a stimulatory effect on biomass. The trends observed for biomass in 2020 were similar to 2019 and appear to be due to the combined influence of natural variability and mining-related activities.

BACI analysis of the data showed that phytoplankton taxa richness was lower at MAM (21% decrease) and significantly lower at WTS (30% decrease; p=0.001). There was considerable natural variability in taxa richness across the baseline period for all areas, which makes it hard to definitively establish whether the decreased phytoplankton richness is mining-related or natural. Considering that this trend could be related to mining activity, phytoplankton richness will be monitored closely in 2021. Trends in phytoplankton biomass and richness will continue to be assessed using the BACI framework in 2021.

Sediment Chemistry

Lakes in the Whale Tail study area have naturally high concentrations of some metals. During the baseline period, arsenic, cadmium, chromium, copper, and zinc exceeded the CCME interim sediment quality guideline in at least one sample collected. 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. The new trigger values derived in 2019 were provided as lake-specific triggers to acknowledge the natural, between-lake variability in some metals. These triggers were applied again in 2020.

Changes in sediment chemistry data are evaluated on a 3-year cycle as part of the sediment coring program (timing coincides with the EEM cycle). Coring was completed in August 2020 and the sediment core metals for which the 2020 mean concentrations exceeded their respective trigger values at the Whale Tail study area lakes were formally assessed using a statistical BA model to assess whether concentrations are increasing over time. The mean sediment concentrations exceeded the triggers for arsenic at WTS, chromium at A20, A76, and DS1, and copper at A20 and A76. For each of these metals, mean concentrations appear to have increased compared to the baseline period. Changes observed compared to baseline concentrations may just be an artefact of natural variability and should continue to be monitored. The observed patterns of sediment chromium and copper at A20, A76, and DS1 (chromium only) appear to be due to natural spatial heterogeneity since the same pattern was not observed at WTS or MAM, which are the two NF stations most likely to be impacted by mine activities. These findings of increased sediment concentrations for some metals should be considered preliminary—with only one year of formal statistical analysis completed on the sediment chemistry data, it is uncertain whether the observed changes and exceedances are mining related or due to natural variability.

Concentrations measured in the various lakes in 2020 were comparable to results reported in previous annual monitoring reports. Other sediment metals from coring samples and grab sampling results for organics analysis showed no mining-related temporal or spatial patterns. Routine sediment grab sampling for TOC, grain size, and hydrocarbons is recommended in 2021 to support the benthos community assessment. Sediment coring is planned for 2023 to assess potential changes in sediment metals concentrations.

Benthos Community

Benthic invertebrate (benthos) community structure (taxa richness) and function (abundance) in the Whale Tail study area lakes is typical of northern headwaters lakes in the region (i.e., relatively low abundance and few taxa). Benthos communities in these lakes have, by virtue of their presence, adapted to the naturally elevated concentrations of some metals in sediment. Although total abundance tends to be low, within-area variability can be substantial. Taxa richness, unlike abundance, is considerably less variable, both temporally (i.e., inter-annually) and spatially (i.e., among the different lakes). The typical number of taxa identified among the various study areas is 10 to 15. The range observed in 2020 was slightly higher in WTS than 2019 but within the range of baseline conditions. All other study areas were also comparable with baseline conditions. The comparatively high taxa richness, combined with no statistically significant changes in abundance at NF areas, demonstrates that mine activities did not alter the structure or function of the benthos community in 2020. Routine monitoring of the benthos community is recommended in 2021.

8.2 METHYLMERCURY STUDIES WHALE TAIL SITE*

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.***

Sampling for the mercury monitoring program was completed in 2020 as outlined in the Mercury Monitoring Plan (Version 2, March 2019). The purpose of the mercury monitoring program is to assess changes in concentrations of mercury in the Whale Tail Lake south basin and sub-watershed lakes (i.e., A20 and A65) as a result of Project-related flooding. The scope of the 2020 program included water and sediment sampling and fish collections (small-bodied species and Lake Trout) at various locations within the Impoundment (WTS), downstream of the Mine, and local reference lakes.

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Below is a summary of the major findings. Agnico will refer to Mercury Monitoring Program report included as Appendix G of the 2020 CREMP Report (Appendix 33) for a complete review and interpretation of the result.

Key findings from the 2020 mercury monitoring program were:

- Water – As expected, mercury concentrations have increased in Impoundment in 2020 compared to pre-flooding conditions (2016-2018). Increases in mercury concentrations were also observed at reference area lakes in 2020 relative to previous years, which suggests a regional climate-influenced change in mercury concentrations, potentially related to higher rainfall and associated runoff in 2019. Despite the observed increase, concentrations in both Whale Tail Lake south basin and Mammoth Lake were below predicted concentrations in the FEIS and well below water quality guidelines for the protection of aquatic life.

- No evidence of stratification in mercury concentrations – Discrete water sampling at various depths was completed at the deepest location in the Impoundment (Lake A20) in December 2020 to determine if anoxic conditions, which can promote higher rates of methylation and subsequent increases in methylmercury, were present. The results showed that water near the bottom of the lake is well oxygenated (no evidence of anoxic conditions) and concentrations of total and methylmercury were uniform throughout the water column.

- Sediment –Sediment mercury concentrations in 2020 were similar to baseline conditions at areas sampled with in the Impoundment and downstream from the Mine. Total mercury concentrations were below the CCME sediment quality guidelines at all areas as well.

- Fish – COVID-19 health restrictions in the fall and winter 2020 resulted in delays in fish tissue sample processing and analysis. Fish mercury concentrations for Lake Trout and small-bodied fish were not available in time to include in this year's report. These results will be included in the 2021 report. Continued monitoring of small-bodied fish tissue chemistry will be determined after analyzing the chemistry data from 2018-2020.

The 2021 mercury monitoring program will be completed as per the scope and schedule outlined in the most recent version of the MMP (Version 2, March 2019). The 2021 monitoring program will focus on continued monitoring of changes in mercury concentrations in water, as well as sediment sampling within the flood zone to allow spatial comparison between flooded and original substrates within the impoundment.

Measured concentrations of mercury are compared to FEIS predictions to understand whether impacts of the project were accurately identified. Refer to Section 12.5.1.2 for FEIS comparison available in 2020.

Finally, the current Mercury Monitoring Plan (Version 2, 2019) does not specifically propose to assess risk to human health from consumption of fish residing in the Project-area lakes on an ongoing basis. Azimuth (2017) modeled expected concentrations in fish tissue, and addressed impacts of increased mercury concentrations in fish on Health Canada's recommended consumption rates. Further risk-based analyses will be implemented in the event that monitoring results exceed model predictions for fish tissue concentrations. This approach is supported by the low rates of fishing by local residents in the Project area (see FEIS Volume 7, Section 7.3), and a no-fishing policy for workers while onsite.

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. Figures 1, 2, 3 and 6 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.

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 July 5th, 2014. In 2019, Agnico have officially informed ECCC that the final discharge point Water Treatment Plant (ST-MMER-1 / ST-9) will no longer be used and is permanently dismantled. For this reason, Agnico is not reporting MDMER and EEM results since 2019.

8.3.1.2 *Vault Attenuation Pond Discharge*

The Vault Discharge became subject to the MDMER on June 27th, 2013 during the dewatering of Vault Lake. There has been no further effluent discharge from the Vault Attenuation Pond to Wally Lake since October 2017. Therefore, sampling station ST-10, also named ST-MMER-2 were not used in 2020. There is currently no plans to have a discharge in 2021.

8.3.1.3 *East Dike Discharge*

The East Dike Seepage Discharge became subject to the MDMER on January 6th, 2014. In 2020, 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.

Agnico Eagle sent a request to ECCC in February 2016 to reduce the testing frequency of the Ra226 to once per quarter. On March 15th, 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 and to reduce acute lethality and Daphnia magna testing to not less than once per quarter. On September 15th, 2016, ECCC approved the Agnico Eagle's request. The reduced frequency has started on October 1st, 2016. Discharge monitoring samples are provided in Table 8-1.

East Dike Seepage (sampling station ST-8, also named ST-MMER-3) was discharged into the receiving environment, Second Portage Lake (SPL), from January 1 to June 5 and October 23 to December 31. Agnico noticed TSS results trending up and therefore the discharge to Second Portage Lake was preventively stopped on June 5th. All water was diverted to the pits, as done in the past. Agnico continued to monitor TSS and restarted the discharge to Second Portage Lake on October 23rd. The total volume discharged in 2020 was 89,496 m^3. There was no exceedance of the TSS MDMER/Water License limit in 2020.

The volume of water discharged to the environment was reported on a weekly basis pursuant to the MDMER monitoring program requirements. Table 8-2 provides a daily breakdown of volumes of water pumped.

Under the Environmental Effects Monitoring (EEM) program, Agnico was required in 2020 to collect sub-lethal toxicity samples at this discharge point. In 2020, there was only one discharge to the receiving environment. For this reason, the East Dike discharge (ST-MMER-3) is the mine's final discharge point that has potentially the most adverse environmental impact on the environment as per Schedule 5 Section 5. Three (3) sub-lethal toxicity samples were collected from the East Dike Discharge in compliance with Schedule 5 Section 6. The sub-lethal toxicity samples were collected on January 6th, April 27th, and October 26th. 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 8-3. This data was previously reported to Environment Canada via the MERS electronic database reporting system.

Table 8-1 Meadowbank 2020 East Dike MDMER Monitoring

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
January											
1-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.76	NMR	NMR
6-Jan-20	0.0021	0.0022	0.003	< 0.0003	0.0009	0.004	2	< 0.0020	7.60	0	0
13-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.47	NMR	NMR
21-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.75	NMR	NMR
27-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	8.12	NMR	NMR
February											
3-Feb-20	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.86	NMR	NMR
10-Feb-20	< 0.0005	0.001	0.003	< 0.0003	< 0.0005	0.002	1	0.007	8.15	NMR	NMR
17-Feb-20	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	8.19	NMR	NMR
24-Feb-20	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	8.10	NMR	NMR
March											
2-Mar-20	0.0005	0.0016	< 0.001	< 0.0003	< 0.0005	< 0.001	3	0.008	7.97	NMR	NMR
9-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	8.15	NMR	NMR
19-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	8.22	NMR	NMR
23-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	8.07	NMR	NMR
30-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.62	NMR	NMR
April											
6-Apr-20	0.0257	0.0019	0.002	< 0.0003	0.0044	0.002	4	0.010	7.51	0	0
13-Apr-20	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	7.99	NMR	NMR
20-Apr-20	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	7.16	NMR	NMR
27-Apr-20	0.0009	0.0012	< 0.001	< 0.0003	< 0.0005	0.0060	4	0.009	6.89	NMR	NMR

May											
4-May-20	0.0006	0.0034	< 0.001	< 0.0003	< 0.0005	0.003	1	0.010	8.07	NMR	NMR
11-May-20	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.88	NMR	NMR
18-May-20	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.65	NMR	NMR
25-May-20	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.82	NMR	NMR
June											
1-Jun-20	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.62	NMR	NMR
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
July											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
August											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
September											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
October											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
24-Oct-20	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	8.51	NMR	NMR
26-Oct-20	0.0009	0.0006	< 0.001	< 0.00017	< 0.0005	< 0.001	4	< 0.002	7.84	0	0
November											
2-Nov-20	0.0010	0.0006	< 0.001	0.00060	< 0.0005	< 0.001	4	< 0.002	7.88	NMR	NMR
9-Nov-20	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	8.01	NMR	NMR
16-Nov-20	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	8.08	NMR	NMR
23-Nov-20	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	8.11	NMR	NMR
30-Nov-20	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	8.11	NMR	NMR
December											
7-Dec-20	0.001	0.00155	< 0.005	0.00027	< 0.001	0.0054	2	< 0.005	8.01	NMR	NMR
14-Dec-20	NMR	NMR	NMR	NMR	NMR	NMR	12	NMR	7.68	NMR	NMR
21-Dec-20	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.50	NMR	NMR
28-Dec-20	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.71	NMR	NMR

Table 8-2 Meadowbank 2020 East Dike MDMER Volume

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
1	460	436	444	294	437	472	0	0	0	0	319	306	
2	468	446	446	353	450	423	0	0	0	0	328	316	
3	464	444	464	450	445	437	0	0	0	0	331	309	
4	464	419	441	468	454	444	0	0	0	0	326	277	
5	471	421	463	438	440	263	0	0	0	0	326	301	
6	427	392	479	586	408	0	0	0	0	0	325	284	
7	409	398	436	493	429	0	0	0	0	0	321	310	
8	436	363	431	441	430	0	0	0	0	0	279	305	
9	501	342	359	516	450	0	0	0	0	0	301	303	
10	443	341	474	457	457	0	0	0	0	0	300	275	
11	490	414	497	411	472	0	0	0	0	0	297	300	
12	466	551	481	188	475	0	0	0	0	0	265	300	
13	412	462	455	315	464	0	0	0	0	0	201	305	
14	473	475	462	460	483	0	0	0	0	0	273	300	
15	522	440	450	242	473	0	0	0	0	0	233	291	
16	462	434	476	239	480	0	0	0	0	0	279	292	
17	462	470	478	407	438	0	0	0	0	0	290	293	
18	468	395	463	394	500	0	0	0	0	0	275	282	
19	463	394	443	405	503	0	0	0	0	0	276	285	
20	461	472	436	478	496	0	0	0	0	0	276	270	
21	429	490	474	460	502	0	0	0	0	0	281	245	
22	374	486	476	441	500	0	0	0	0	0	268	294	
23	353	457	489	457	501	0	0	0	0	320	285	284	
24	339	429	506	433	497	0	0	0	0	321	249	289	
25	340	473	447	402	503	0	0	0	0	319	254	283	
26	336	468	431	429	487	0	0	0	0	324	263	296	
27	365	436	452	499	504	0	0	0	0	324	249	290	
28	389	355	447	473	498	0	0	0	0	337	285	281	
29	416	436	442	441	483	0	0	0	0	329	205	295	
30	420		360	480	496	0	0	0	0	328	240	292	
31	426		349		475		0	0		324		300	
Total (m^3)	**13,410**	**12,537**	**13,949**	**12,548**	**14,632**	**2,039**	**0**	**0**	**0**	**2,927**	**8,401**	**9,053**	**89,496**

Table 8-3 Meadowbank 2020 East Dike EEM Monitoring (ST-MMER-3)

	Ammonia	Alkalinity	Aluminum	Cadmium	Chloride	Chromium	Cobalt	Hardness	Iron	Manganese	Mercury	Molybdenum	Nitrate	Phosphorus	Selenium	Sulphate	Thallium	Uranium	Conductivity	T°	Sub-Lethal Toxicity			
	mg N/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C	*Ceriodaphia dubia*	*Fathead minnow*	*Lemna minor*	*Pseudokirchneriella subcapitata*
Effluent characterization (65°01'11.21"N 96°02'32.00" W) (ST-MMER-3-EEM)																								
6-Jan-20	0.08	52	0.034	< 0.00002	1	0.0006	< 0.0005	31	0.11	< 0.0005	< 0.00001	< 0.0005	0.09	< 0.01	< 0.001	7.3	< 0.0008	< 0.001	73.2	5.10	With SE and Without AL	Without SE and Without AL	Without SE	Without SE
10-Feb-20	0.02	47	0.023	< 0.00002	1.9	0.0019	< 0.0005	26	< 0.01	0.0013	< 0.00001	< 0.0005	0.07	< 0.01	< 0.001	2.3	< 0.0002	< 0.001	77.8	2.30	NMR	NMR	NMR	NMR
27-Apr-20	0.01	27	0.023	< 0.00002	1	0.0008	< 0.0005	31	0.03	0.0017	< 0.00001	< 0.0005	0.08	0.01	< 0.001	7.2	< 0.0002	< 0.001	87.2	1.80	With SE and With AL	* Without SE and Without AL	Without SE	Without SE
26-Oct-20	0.02	55	0.018	< 0.00002	0.98	< 0.0006	< 0.0005	30	0.01	< 0.0005	0.00002	< 0.0005	0.06	< 0.04	< 0.0005	6.8	< 0.0002	< 0.001	64.0	7.20	Without SE and without AL	With SE and without AL	Without SE	With SE
****Annual Average**	-	-	-	-	-	-	-	-	-	-	**0.00000875**	-	-	-	**0.0004375**	-	-	-	-	-	-	-	-	-

**Holding time exceeded*
***Annual average calculated using half the detection limit*
SE: Sub-Lethal effects
AL: Acute Lethality
NMR: No measure requirement

	Ammonia	Alkalinity	Aluminium	Cadmium	Chloride	Chromium	Cobalt	Hardness	Iron	Manganese	Mercury	Molybdenum	Nitrate	Phosphorus	Selenium	Sulphate	Thallium	Uranium	Conductivity	T°	pH	O_2	O_2	Arsenic	Copper	Cyanide	Lead	Nickel	Ra226	TSS	Zinc
	mg N/L	mg $CaCO_3$/	mg/L	mg/L	mg/L	mg/L	mg/L	g $CaCO_3$	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C		%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Bq/L	mg/L	mg/L
Water Quality Monitoring Exposure Area (65°01'10.81'' N 96°02'22.64''W) (ST-MMER-3-EEM-SPLE)																															
21-Jan-20	0.02	29	< 0.006	< 0.00002	0.9	< 0.0005	< 0.0005	22	0.02	0.0011	< 0.00001	< 0.0005	< 0.01	< 0.01	< 0.001	6.9	< 0.0008	< 0.001	41.6	0.93	7.02	120.5	16.76	< 0.0005	0.0007	< 0.001	< 0.0003	0.0023	< 0.002	1	0.003
22-Mar-20	< 0.01	48	< 0.006	< 0.00002	1	0.0016	< 0.0005	15	< 0.01	0.0007	< 0.00001	< 0.0005	< 0.01	0.01	< 0.001	5.1	< 0.0002	< 0.001	42.4	1.06	6.77	130	18.25	< 0.0005	0.0007	< 0.001	< 0.0003	< 0.0005	NA	3	0.003
10-May-20	< 0.01	19	< 0.006	< 0.00002	1.1	< 0.0006	< 0.0005	17	< 0.01	0.0007	< 0.00001	< 0.0005	0.03	< 0.01	< 0.001	6.6	< 0.0002	< 0.001	46.6	0.92	6.68	121.2	17.11	< 0.0005	0.0007	< 0.001	< 0.0003	0.0007	NA	< 1	0.134
15-Nov-20	< 0.01	49	< 0.005	< 0.00002	0.9	< 0.0006	< 0.0005	16	< 0.01	0.0007	< 0.00001	< 0.0005	< 0.01	< 0.04	< 0.0005	4.6	< 0.0002	< 0.001	36.7	0.41	7.04	16.17	113.4	< 0.0005	< 0.0005	< 0.001	< 0.0003	< 0.0005	NA	< 1	< 0.001
Water Quality Monitoring Reference Area (65°58'10.90'' N 96°09'51.37'' W) (ST-MMER-1-EEM-TPS)																															
21-Jan-20	< 0.01	47	< 0.006	< 0.00002	0.9	< 0.0006	< 0.0005	13	< 0.01	0.0010	< 0.00001	< 0.0005	< 0.01	< 0.01	< 0.001	7.4	< 0.0008	< 0.001	33.5	0.74	7.31	141	19.56	< 0.0005	< 0.0005	< 0.001	< 0.0003	0.0006	0.007	1	0.002
22-Mar-20	< 0.01	49	< 0.006	0.00003	1.0	< 0.0006	0.0005	13	0.03	0.0006	< 0.00001	< 0.0005	< 0.01	< 0.01	< 0.001	5.7	< 0.0002	< 0.001	32.7	1.01	7.07	138.7	19.49	< 0.0005	0.0007	< 0.001	< 0.0003	< 0.0005	< 0.002	5	< 0.001
10-May-20	0.01	9	< 0.006	< 0.00002	0.9	0.0010	< 0.0005	10	< 0.01	< 0.0005	< 0.00001	< 0.0005	0.03	< 0.01	< 0.001	5.7	< 0.0002	< 0.001	32.4	1.05	6.85	120.0	16.76	< 0.0005	< 0.0005	< 0.001	< 0.0003	< 0.0005	0.010	< 1	< 0.001
15-Nov-20	< 0.005	31	< 0.005	< 0.00002	0.8	< 0.0006	< 0.0005	10	< 0.01	0.0011	< 0.00001	0.0006	< 0.01	0.04	< 0.0005	3.6	< 0.0002	< 0.001	26.8	0.45	6.84	105.5	15	< 0.0005	< 0.0005	< 0.001	< 0.00017	< 0.0005	< 0.002	< 1	< 0.001

8.3.2 Whale Tail Site

8.3.2.1 *ST-MDMER-4*

During the in-water portion of the Whale Tail Dike Construction, Agnico had discharged an effluent from the construction dewatering activities. The Whale Tail Site became subject to the MDMER on July 27th, 2018. The sample was taken from the Water Treatment Plant prior to the release on the tundra, which flowed onto a natural boulder field at the edge of the Whale Tail Lake North Basin (receiving environment). In 2019, Agnico has officially informed ECCC that the final discharge point Whale Tail North Basin (ST-MDMER-4) will no longer be used and was permanently dismantled.

8.3.2.2 *ST-MDMER-5*

During the dewatering of the Whale Tail North Basin, a FDP was created in 2019 - ST-MDMER-5 WT North Basin Dewatering Phase 1. The dewatering of Whale Tail North was completed on May 20th, 2020 however, the FDP name will remain the same in MERS. This FDP was subject to MDMER on March 5th, 2019. In 2020, depending of the water quality, ST-MDMER-5 was pumped and discharged to Whale Tail Lake South Basin with or without water treatment to be compliant with Section 4 (1) of the regulation. The effluent was discharged via a submerged diffuser to control erosion and disturbance to bottom sediments. The final discharge point (FDP) is located near the shore of Whale Tail South Basin. The FDP ST-MDMER-5 was in operation from January 1 to 26, February 11 to 23, February 29 to March 8, March 15 to 22, March 30 to April 3, April 15 to 20, April 25 to 30, May 7 to 15, May 28 to June 16, September 1 to 14 and October 12 to November 1. In 2020, different intakes were associated with this FDP and notification were sent to ECCC before proceeding with the modification. As per previous discussions with ECCC, these modifications relate to internal water management and the changes to the intake/source would not effect the requirements laid out in Section 9 and 10 of the MDMER. No non-compliance were observed in 2020 for this FDP.

The total volume discharged in 2020 for the Whale Tail North Basin dewatering was 741,620 m^3. Discharge monitoring samples are provided in Table 8-4. There were no MDMER non-compliance in 2020.

The intake was moved to Lake A53 for dewatering of the lake that would become the IVR Attenuation Pond. The total volume of water pumped from Lake A53 was 146,293m^3. There were no MDMER non-compliance, the results are provided in Table 8-4. Dewatering of Lake A53 occurred from September 1st to 14th.

This FDP was used as a temporary diffuser to discharge the water from the Whale Tail Attenuation pond to Whale Tail South until the completion of the permanent diffuser. The total volume of water pumped from was 412,165m^3. Discharge occurred from May 28th to June 16th and October 12th to November 1st. The results are provided in Table 8-4, there were no MDMER non-compliance.

A total of 1,300,078 m^3 was discharged via this FDP in 2020. The volume of water discharged to the environment was reported on a weekly basis pursuant to the MDMER monitoring program requirements. Table 8-5 provides a daily breakdown of volumes of water pumped.

Water quality samples were taken from the discharge location (ST-MDMER-5), the receiving environment exposure area (ST-MDMER-5-EEM-WTSE) and reference area (TPS or ST-MMER-1-EEM-TPS). These sampling locations are highlighted on Figures 2 and 4. Results of the EEM water quality monitoring program are presented in Tables 8-6. This data was previously reported to Environment Canada via the MERS electronic database reporting system.

Table 8-4 Whale Tail North Dewatering Phase 1 2020 MDMER Monitoring (ST-MDMER-5)

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
January											
1-Jan-20	0.0061	0.0005	0.001	< 0.0003	0.0032	0.006	2	< 0.0020	7.13	NMR	NMR
2-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.36	NMR	NMR
3-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.07	NMR	NMR
4-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.11	NMR	NMR
5-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	6.98	NMR	NMR
6-Jan-20	0.0062	0.0006	< 0.001	< 0.0003	0.0027	0.008	2	0.011	6.92	0	0
7-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.10	NMR	NMR
8-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	7.09	NMR	NMR
9-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.03	NMR	NMR
10-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	7.18	NMR	NMR
11-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.50	NMR	NMR
12-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.32	NMR	NMR
13-Jan-20	0.0071	0.0010	< 0.0010	< 0.0003	0.0029	0.0100	7	0.0180	7.38	NMR	NMR
14-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.32	NMR	NMR
15-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.20	NMR	NMR
17-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.18	NMR	NMR
18-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	7.14	NMR	NMR
19-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	6.96	NMR	NMR
20-Jan-20	0.0051	0.0025	< 0.001	< 0.0003	0.0026	0.008	6	0.009	6.60	NMR	NMR
21-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	6.94	NMR	NMR
24-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.15	NMR	NMR
25-Jan-20	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.01	NMR	NMR

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
26-Jan-20	0.0064	0.0011	< 0.001	< 0.0003	0.0024	0.009	4	0.029	7.07	NMR	NMR
February											
11-Feb-20	0.0069	0.002	< 0.001	< 0.0003	0.0028	0.007	10	0.011	7.15	NMR	NMR
14-Feb-20	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	6.87	NMR	NMR
15-Feb-20	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	7.03	NMR	NMR
16-Feb-20	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.04	NMR	NMR
17-Feb-20	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.18	NMR	NMR
18-Feb-20	0.0045	0.0025	< 0.001	< 0.0003	0.0042	0.009	8	0.014	6.58	10*	0
19-Feb-20	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	6.78	NMR	NMR
20-Feb-20	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.18	NMR	NMR
21-Feb-20	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	6.84	NMR	NMR
22-Feb-20	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	6.99	NMR	NMR
23-Feb-20	0.0029	0.0005	0.001	< 0.0003	0.0021	0.007	9	0.007	6.97	NMR	NMR
29-Feb-20	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.57	NMR	NMR
March											
1-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.18	NMR	NMR
2-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	10	NMR	6.94	NMR	NMR
3-Mar-20	0.003	0.0017	< 0.001	< 0.0003	0.0019	0.001	3	0.015	7.50	0	0
4-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.75	NMR	NMR
5-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.73	NMR	NMR
6-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	6.80	NMR	NMR
7-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	7.12	NMR	NMR
8-Mar-20	0.0018	< 0.0005	< 0.001	0.0006	0.0021	0.014	2	0.016	6.87	NMR	NMR
16-Mar-20	0.0019	0.0035	< 0.001	< 0.0003	0.0019	0.014	7	0.008	7.00	NMR	NMR

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
17-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	6.94	NMR	NMR
18-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	11	NMR	6.94	NMR	NMR
19-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	6.85	NMR	NMR
20-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	6.88	NMR	NMR
21-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	6.97	NMR	NMR
22-Mar-20	0.0026	0.001	< 0.001	< 0.0003	0.0018	0.007	4	< 0.002	7.05	NMR	NMR
30-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.54	NMR	NMR
31-Mar-20	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.57	NMR	NMR
April											
1-Apr-20	NMR	NMR	NMR	NMR	NMR	NMR	19	NMR	7.58	NMR	NMR
2-Apr-20	0.0036	0.0018	0.001	< 0.0003	0.0028	0.006	14	0.02	7.41	NMR	NMR
3-Apr-20	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.13	NMR	NMR
15-Apr-20	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.94	NMR	NMR
16-Apr-20	0.0017	0.0019	< 0.001	< 0.0003	0.0022	0.011	2	0.01	6.49	NMR	NMR
17-Apr-20	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.00	NMR	NMR
18-Apr-20	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.07	NMR	NMR
19-Apr-20	0.0021	0.0009	< 0.001	< 0.0003	0.0015	0.003	2	0.012	7.19	0	0
20-Apr-20	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	6.69	NMR	NMR
25-Apr-20	0.0023	0.0014	< 0.001	< 0.0003	0.0020	0.015	2	0.007	7.08	NMR	NMR
26-Apr-20	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	6.91	NMR	NMR
27-Apr-20	0.0023	0.0011	0.001	< 0.0003	0.0016	0.004	4	0.013	7.18	NMR	NMR
28-Apr-20	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.18	NMR	NMR
29-Apr-20	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.19	NMR	NMR
30-Apr-20	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.15	NMR	NMR

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
May											
7-May-20	0.0016	0.0012	< 0.001	< 0.0003	0.0035	0.019	3	0.014	7.27	NMR	NMR
8-May-20	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.27	NMR	NMR
9-May-20	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	6.92	NMR	NMR
10-May-20	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	7.06	NMR	NMR
11-May-20	0.0032	0.0017	0.001	< 0.0003	0.0025	0.017	2	0.014	6.92	0	0
12-May-20	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	6.91	NMR	NMR
13-May-20	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	6.91	NMR	NMR
14-May-20	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.02	NMR	NMR
15-May-20	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	6.92	NMR	NMR
29-May-20	0.0042	0.005	0.034	< 0.0003	0.0123	0.011	15	0.052	7.00	NMR	NMR
31-May-20	0.0039	0.0045	0.054	< 0.0003	0.0099	0.018	6	0.036	6.89	*0	*0
June											
1-Jun-20	0.0035	0.0036	0.034	< 0.0003	0.0096	0.012	3	0.017	6.85	NMR	NMR
8-Jun-20	0.0037	0.0022	0.007	< 0.0003	0.0081	0.011	6	0.012	7.24	0	0
14-Jun-20	0.0059	0.0019	0.013	< 0.0003	0.0130	0.009	1	0.017	7.16	NMR	NMR
	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
July											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
August											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
September											
September 1, 2020	< 0.0005	< 0.0005	< 0.001	< 0.00017	0.0020	< 0.001	4	< 0.002	7.11	0	0
September 2, 2020	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	1	NDEP	7.03	NMR	NMR

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
September 3, 2020	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	1	NDEP	7.41	NMR	NMR
September 4, 2020	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	1	NDEP	7.56	NMR	NMR
September 5, 2020	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	1	NDEP	7.11	NMR	NMR
September 6, 2020	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	1	NDEP	7.21	NMR	NMR
September 7, 2020	< 0.0005	0.0010	0.001	< 0.00017	0.0023	0.003	1	< 0.002	7.16	NMR	NMR
September 8, 2020	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	1	NDEP	7.12	NMR	NMR
September 9, 2020	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	2	NDEP	7.52	NMR	NMR
September 10, 2020	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	2	NDEP	7.38	NMR	NMR
September 11, 2020	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	2	NDEP	7.41	NMR	NMR
September 12, 2020	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	3	NDEP	7.38	NMR	NMR
September 13, 2020	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	3	NDEP	7.44	NMR	NMR
September 14, 2020	0.0008	0.0009	< 0.001	< 0.00017	0.0026	0.003	6	0.024	7.60	NMR	NMR
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
October											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
12-Oct-20	NRM	NRM	NRM	NRM	NRM	NRM	3	NRM	7.22	NRM	NRM
13-Oct-20	0.0020	0.0025	0.012	< 0.00017	0.0088	0.009	2	0.010	6.93	0	0
14-Oct-20	NRM	NRM	NRM	NRM	NRM	NRM	3	NRM	6.97	NRM	NRM
15-Oct-20	NRM	NRM	NRM	NRM	NRM	NRM	4	NRM	7.20	NRM	NRM
16-Oct-20	NRM	NRM	NRM	NRM	NRM	NRM	3	NRM	6.95	NRM	NRM
17-Oct-20	NRM	NRM	NRM	NRM	NRM	NRM	2	NRM	7.02	NRM	NRM
18-Oct-20	NRM	NRM	NRM	NRM	NRM	NRM	3	NRM	6.95	NRM	NRM
19-Oct-20	0.0030	0.0027	0.005	< 0.00017	0.0070	0.055	10	0.014	7.06	NMR	NMR
21-Oct-20	NRM	NRM	NRM	NRM	NRM	NRM	6	NRM	7.24	NRM	NRM

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
23-Oct-20	NRM	NRM	NRM	NRM	NRM	NRM	3	NRM	7.63	NRM	NRM
26-Oct-20	0.0023	0.0006	0.007	< 0.00017	0.0033	< 0.001	5	0.011	7.17	NMR	NMR
28-Oct-20	NRM	NRM	NRM	NRM	NRM	NRM	4	NRM	7.75	NRM	NRM
30-Oct-20	NRM	NRM	NRM	NRM	NRM	NRM	1	NRM	7.20	NRM	NRM
November											
1-Nov-20	0.0022	0.0021	0.019	< 0.00017	0.0044	0.004	9	0.012	6.80	0	30
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
December											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP

* In 100% concentration, one test organism died accidentally on 2020-02-22. This organism was excluded from observation.
Test endpoint is based on a total of 9 test organism exposed in the 100% concentration

Table 8-5 ST-MDMER-5 2020 Volume

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
1	9,611	0	19,860	16,453	0	9,105	0	0	216	0	2,471	0	
2	9,933	0	14,633	9,493	0	9,046	0	0	14,758	0	0	0	
3	9,519	0	9,275	965	0	8,989	0	0	13,000	0	0	0	
4	9,089	0	9,399	0	0	9,055	0	0	14,581	0	0	0	
5	8,502	0	9,543	0	0	9,390	0	0	15,269	0	0	0	
6	8,490	0	8,621	0	0	11,891	0	0	709	0	0	0	
7	8,477	0	7,894	0	3,486	18,879	0	0	771	0	0	0	
8	8,484	0	729	0	6,528	19,190	0	0	162	0	0	0	
9	8,317	0	0	0	6,393	16,755	0	0	12,525	0	0	0	
10	7,905	0	0	0	6,954	18,353	0	0	15,564	0	0	0	
11	8,228	6,576	0	0	7,248	19,469	0	0	15,564	0	0	0	
12	8,149	9,536	0	0	7,083	19,455	0	0	15,564	7,277	0	0	
13	8,104	19,914	0	0	6,980	9,577	0	0	15,210	7,871	0	0	
14	8,124	20,441	3	0	5,868	14,043	0	0	12,401	8,749	0	0	
15	8,339	19,736	3,531	13,396	5,100	15,944	0	0	0	8,721	0	0	
16	8,482	15,567	11,673	15,017	0	5,007	0	0	0	8,541	0	0	
17	8,352	10,368	10,848	14,111	0	0	0	0	0	7,604	0	0	
18	8,499	9,712	10,751	10,237	0	0	0	0	0	7,508	0	0	
19	8,378	8,699	10,566	8,256	0	0	0	0	0	7,471	0	0	
20	8,391	8,294	10,412	3,296	0	0	0	0	0	6,576	0	0	
21	8,379	8,539	8,583	0	0	0	0	0	0	6,879	0	0	
22	8,303	8,340	3,779	0	0	0	0	0	0	6,675	0	0	
23	8,284	4,090	0	0	0	0	0	0	0	6,781	0	0	
24	8,294	0	0	0	0	0	0	0	0	6,812	0	0	
25	7,899	0	0	7,697	0	0	0	0	0	6,900	0	0	
26	4,534	0	0	9,405	0	0	0	0	0	6,816	0	0	
27	0	0	0	9,595	0	0	0	0	0	6,793	0	0	
28	0	0	0	8,610	9,637	0	0	0	0	6,743	0	0	
29	0	6,551	0	8,232	16,535	0	0	0	0	8,529	0	0	
30	0		6,166	4,224	4,705	0	0	0	0	9,854	0	0	
31	0		17,300		14,272		0	0	0	7,298		0	
Total (m^3)	**217,066**	**156,361**	**173,565**	**138,987**	**100,790**	**214,149**	**0**	**0**	**146,293**	**150,396**	**2,471**	**0**	**1,300,078**

Table 8-6 Whale Tail North Dewatering Phase 1 2020 EEM Monitoring

	Ammonia	Alkalinity	Al	Cd	Cl	Cr	Co	Hardness	Fe	Mn	Hg	Mo	Nitrate	P	Se	Sulphate	Tl	U	Conductivity	T°
	mg N/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C
Effluent characterization (65°23'51.30"N 96°40'49.00" W) (ST-MDMER-5-EEM)																				
6-Jan-20	0.12	50	< 0.006	< 0.00002	41.9	< 0.0006	0.0008	99	0.36	0.3836	< 0.00001	0.002	0.08	0.06	< 0.001	16.5	< 0.0008	< 0.001	246.8	2.50
11-Feb-20	0.12	55	0.031	< 0.00002	23	< 0.0006	0.0005	67	1.2	0.2381	< 0.00001	0.0024	0.10	0.01	< 0.001	16.5	< 0.0002	< 0.001	188.2	0.30
19-Apr-20	0.1	32	0.014	< 0.00002	23.4	0.0007	< 0.0005	76	0.4	0.2224	< 0.00001	0.0019	0.18	< 0.01	< 0.001	17	< 0.0002	< 0.001	188.0	1.20
27-Apr-20	0.1	29	0.012	< 0.00002	21.7	< 0.0006	0.0005	65	0.48	0.1787	< 0.00001	0.0014	0.18	< 0.01	< 0.001	20.6	< 0.0002	< 0.001	179.8	1.10
8-Jun-20	0.64	28	0.031	< 0.00002	29.1	< 0.0006	0.002	79	0.48	0.3304	< 0.00001	0.0014	1.32	< 0.01	< 0.001	31.8	< 0.0002	< 0.001	223.0	1.70
1-Sep-20	0.02	20	0.042	0.00002	59	< 0.0006	< 0.0005	94	0.1	0.055	< 0.00001	< 0.0005	< 0.01	< 0.01	< 0.001	4.3	< 0.0002	< 0.001	214.2	8.70
26-Oct-20	0.38	62	0.021	< 0.00002	35	0.0007	0.0009	100	0.49	0.2062	0.00001	0.0036	0.47	< 0.04	< 0.0005	30	< 0.0002	< 0.001	250.0	1.40
1-Nov-20	0.76	77	0.019	< 0.00002	29	0.0007	0.0008	87	0.54	0.2119	< 0.00001	0.0027	0.88	1.2	< 0.0005	27	< 0.0002	< 0.001	213.8	1.10
*** Annual Average**	-	-	-	-	-	-	-	-	-	-	**0.000005**	-	-	-	**0.000044**	-	-	-	-	-

* Half the detection limit was used when calculating the average

	Ammonia	Alkalinity	Al	Cd	Cl	Cr	Co	Hardness	Fe	Mn	Hg	Mo	Nitrate	P	Se	Sulphate	Tl	U	Conductivity	T°	pH	O_2	O_2	As	Cu	CN	Pb	Ni	Ra226	TSS	Zn
	mg N/L	mg CaCO3/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C		mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	Bq/L	mg/L	mg/L
Water Quality Monitoring Exposure Area (65°23'49.08'' N 96°40'58.00''W) (ST-MDMER-5-EEM-WTSE)																															
20-Jan-20	0.08	33	0.01	< 0.00002	17.4	< 0.0006	< 0.0005	35	0.12	0.0686	< 0.00001	< 0.0005	0.04	0.02	< 0.001	9.5	< 0.0002	< 0.001	68.9	0.57	7.07	15.32	109.6	0.0009	< 0.0005	< 0.001	< 0.0003	0.002	< 0.002	2	0.002
22-Mar-20	0.02	52	0.007	< 0.00002	20.7	< 0.0006	< 0.0005	44	0.09	0.1039	< 0.00001	< 0.0005	0.13	< 0.01	< 0.001	7.3	< 0.0002	< 0.001	133.2	0.53	6.88	12.9	92.4	0.001	0.0008	< 0.001	< 0.0003	0.0026	< 0.002	< 1	0.003
10-May-20	0.02	18	< 0.006	< 0.00002	20.1	< 0.0006	< 0.0005	43	0.09	0.1089	< 0.00001	0.0006	0.12	< 0.01	< 0.001	6.9	< 0.0002	< 0.001	132.3	0.35	7.03	12.3	87.7	0.0009	0.0007	0.002	< 0.0003	0.0033	0.012	< 1	0.002
2-Sep-20	0.03	72	0.01	< 0.00002	12.7	< 0.0006	< 0.0005	33	0.15	0.0528	< 0.00001	< 0.0005	0.07	0.01	< 0.001	6.4	< 0.0002	< 0.001	87.1	9.60	7.46	9.89	98.3	< 0.0005	< 0.0005	< 0.001	< 0.0002	0.0015	< 0.002	4	< 0.001
Water Quality Monitoring Reference Area (65°58'10.90'' N 96°09'51.37'' W) (ST-EEM-TPS)																															
21-Jan-20	< 0.01	47	< 0.006	< 0.00002	0.9	< 0.0006	< 0.0005	13	< 0.01	0.001	< 0.00001	< 0.0005	< 0.01	< 0.01	< 0.001	7.4	< 0.0008	< 0.001	33.5	0.74	7.31	19.56	141.00	< 0.0005	< 0.0005	< 0.001	< 0.0003	0.0006	0.007	1	0.002
22-Mar-20	< 0.01	49	< 0.006	0.00003	1	< 0.0006	< 0.0005	13	0.03	0.0006	< 0.00001	< 0.0005	< 0.01	< 0.01	< 0.001	5.7	< 0.0002	< 0.001	32.7	1.01	7.07	19.49	138.70	< 0.0005	0.0007	< 0.001	< 0.0003	< 0.0005	< 0.002	5	< 0.001
10-May-20	0.01	9	< 0.006	< 0.00002	0.9	0.001	< 0.0005	10	< 0.01	< 0.0005	< 0.00001	< 0.0005	0.03	< 0.01	< 0.001	5.7	< 0.0002	< 0.001	32.4	1.05	6.85	16.76	120.00	< 0.0005	< 0.0005	< 0.001	< 0.0003	< 0.0005	0.01	< 1	< 0.001
2-Sep-20	< 0.01	43	< 0.006	< 0.00002	0.7	< 0.0006	< 0.0005	9	< 0.01	0.0011	< 0.00001	< 0.0005	< 0.01	< 0.01	< 0.001	3.5	< 0.0002	< 0.001	26.4	10.08	6.81	11.76	105.9	< 0.0005	< 0.0005	< 0.001	< 0.0003	< 0.0005	< 0.002	1	< 0.001

T°, pH, O_2 and Conductivity took on the field by the environmental technician

8.3.2.3 *ST-MDMER-6*

During the Phase 2 dewatering of the Whale Tail North Basin, the ST-MDMER-6 FDP was created in 2019. This FDP was subject to MDMER on June 17th, 2019. When water from the Whale Tail North Basin dewatering required treatment for TSS, the water was pumped and treated via the Water Treatment Plant and discharged back in Mammoth Lake via a submerged diffuser to control erosion and disturbance to bottom sediments. This final discharge point was not used in 2020 but remains active on MERS . There are no discharge monitoring results for 2020.

8.3.2.4 *ST-MDMER-7 (Mammoth Lake West Diffuser)*

A third Final discharge point (FDP) was created in 2019 and it's the Quarry 1 water discharged to Mammoth Lake via a submerged diffuser to control erosion and disturbance to bottom sediments – ST-MDMER-7. ST-MDMER-7 intake was originally planned to be the Whale Tail Attenuation Pond and the sampling point of the FDP at the Water Treatment Plan. Since the Whale Tail Attenuation Pond was not yet operational due to ongoing dewatering, Agnico sent a notification of modification to ECCC on September 19th, 2019 to move the intake from Whale Tail Attenuation Pond to Quarry 1. The sampling point of the FDP moved from after the WTP to the intake of the pump in Quarry 1. Discharge from Quarry 1 to Mammoth Lake occurred from April 13 to 15 and April 25 to 29. The total volume discharged from Quarry 1 in 2020 was 74,812 m^3. Discharge monitoring samples are provided in Table 8-7. No non-compliance with the MDMER regulation Section 12 and 13 were observed in 2020.

On March 20th, 2020, Agnico Eagle sent a notification to ECCC to modify this FDP and move the intake to the Whale Tail Attenuation Pond. Discharge from the Whale Tail Attenuation Pond to Mammoth Lake via ST-MDMER-7 occurred from May 20th to 28th, June 14th to 20th, June 23rd to 26th, August 23rd to September 20th. The total Volume of water discharged from the Whale Tail Attenuation Pond from this FDP was 469,513 m^3 in 2020. No MDMER non-compliance occurred in 2020.

The total volume of water discharged from the FDP in 2020 (both Quarry 1 and the Whale Tail Attenuation Pond) was 544,326 m^3. The volume of water discharged to the environment was reported on a weekly basis pursuant to the MDMER monitoring program requirements. Table 8-8 provides a daily breakdown of volumes of water pumped.

The water quality samples were taken from the discharge location (ST-MDMER-7), the receiving environment exposure area (EEM-7-MAME-2) and reference area (TPS or ST-MMER-1-EEM-TPS). These sampling locations are highlighted on Figures 2 and 4. Results of the EEM water quality monitoring program are presented in Tables 8-9. This data was previously reported to Environment Canada via the MERS electronic database reporting system.

Table 8-7 ST-MDMER-7 2020 MDMER Monitoring

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
January											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
February											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
March											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
April											
13-Apr-20	0.0474	0.0524	0.034	< 0.0003	0.0278	0.002	7	0.071	7.78	NMR	NMR
25-Apr-20	0.0144	0.0039	0.0039	< 0.0003	0.0153	0.004	2	0.107	7.24	NMR	NMR
27-Apr-20	0.0162	0.0052	0.0052	< 0.0003	0.0202	0.006	3	0.098	6.95	0	0
May											
23-May-20	0.0035	0.0046	0.032	< 0.0003	0.0068	0.005	1	0.031	6.91	NMR	NMR
25-May-20	0.0075	0.0041	0.027	< 0.0003	0.0070	0.003	7	0.026	7.22	0	0
June											
14-Jun-20	0.0052	0.0016	0.010	< 0.0003	0.0131	0.015	3	0.024	6.99	0	0
23-Jun-20	0.0109	0.0070	0.038	< 0.0003	0.0254	0.036	7	0.026	6.58	NMR	NMR
25-Jun-20	0.0103	0.0038	0.030	< 0.0003	0.0219	0.018	6	0.030	6.73	NMR	NMR
July											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
August											
24-Aug-20	0.0037	0.003	0.023	< 0.00017	0.0193	0.032	5	0.022	6.79	0	0
September											
1-Sep-20	0.0036	0.0048	0.019	< 0.00017	0.0277	0.020	3	0.022	6.94	NMR	NMR
7-Sep-20	0.0034	0.0008	0.006	< 0.00017	0.0235	0.013	5	0.020	7.11	0	0
14-Sep-20	0.0052	0.0028	0.032	< 0.00017	0.0274	0.020	3	0.025	7.03	NMR	NMR
20-Sep-20	0.0054	0.0009	0.007	< 0.00017	0.0275	0.009	5	< 0.002	6.96	NMR	NMR
October											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
November											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
December											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP

NDEP :No Deposit

NMR: No Measurement Required

Table 8-8 ST-MDMER-7 2020 Volume

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
1	0	0	0	0	0	0	0	0	10,352	0	0	0	
2	0	0	0	0	0	0	0	0	11,698	0	0	0	
3	0	0	0	0	0	0	0	0	11,710	0	0	0	
4	0	0	0	0	0	0	0	0	11,334	0	0	0	
5	0	0	0	0	0	0	0	0	11,678	0	0	0	
6	0	0	0	0	0	0	0	0	10,626	0	0	0	
7	0	0	0	0	0	0	0	0	9,143	0	0	0	
8	0	0	0	0	0	0	0	0	10,182	0	0	0	
9	0	0	0	0	0	0	0	0	8,268	0	0	0	
10	0	0	0	0	0	0	0	0	8,501	0	0	0	
11	0	0	0	0	0	0	0	0	8,208	0	0	0	
12	0	0	0	0	0	0	0	0	8,056	0	0	0	
13	0	0	0	7,186	0	0	0	0	7,426	0	0	0	
14	0	0	0	11,976	0	9,708	0	0	8,932	0	0	0	
15	0	0	0	8,383	0	12,673	0	0	2,787	0	0	0	
16	0	0	0	0	0	11,191	0	0	11,678	0	0	0	
17	0	0	0	0	0	10,010	0	0	13,946	0	0	0	
18	0	0	0	0	0	9,183	0	0	13,260	0	0	0	
19	0	0	0	0	0	7,304	0	0	13,364	0	0	0	
20	0	0	0	0	244	7,553	0	0	6,723	0	0	0	
21	0	0	0	0	4,512	0	0	0	0	0	0	0	
22	0	0	0	0	5,811	0	0	0	0	0	0	0	
23	0	0	0	0	13,446	5,326	0	3,384	0	0	0	0	
24	0	0	0	0	16,296	9,273	0	11,348	0	0	0	0	
25	0	0	0	8,376	16,020	10,069	0	10,179	0	0	0	0	
26	0	0	0	11,368	15,636	8,087	0	8,917	0	0	0	0	
27	0	0	0	11,966	17,919	0	0	8,273	0	0	0	0	
28	0	0	0	10,770	7,672	0	0	6,305	0	0	0	0	
29	0		0	4,787	0	0	0	7,507	0	0	0	0	
30	0		0	0	0	0	0	9,360	0	0	0	0	
31	0		0		0		0	8,438		0		0	
Total (m^3)	**0**	**0**	**0**	**74,812**	**97,556**	**100,375**	**0**	**73,711**	**197,871**	**0**	**0**	**0**	**544,326**

Table 8-9 ST-MDMER-7 1 2020 EEM Monitoring

	Ammonia	Alkalinity	Al	Cd	Cl	Cr	Co	Hardness	Fe	Mn	Hg	Mo	Nitrate	P	Se	Sulphate	Tl	Ur	Conductivity	T°
	mg N/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C
Effluent characterization (65°24'18.8'' N 96°41'28.96''W / 65°23'50.03''N 96°44'15.48''W) (ST-MDMER-7-EEM)																				
27-Apr-20	1.68	75	0.07	< 0.00002	213.6	0.0011	0.0029	419	0.1	0.5131	< 0.00001	0.0179	10.90	< 0.01	0.002	60.9	< 0.0002	0.009	1010	0.60
25-May-20	1.98	51	0.038	< 0.00002	76.9	0.0011	0.0008	143	0.63	0.2159	< 0.00001	0.0079	3.93	< 0.01	< 0.001	23	< 0.0002	0.002	462.7	0.70
14-Jun-20	0.9	21	0.01	0.0006	38	< 0.0006	0.0022	85	0.21	0.3309	< 0.00001	0.0017	2.52	< 0.01	< 0.001	36.1	< 0.0002	< 0.001	262.0	2.50
24-Aug-20	1.11	49	0.009	< 0.00002	66.4	< 0.0006	0.0027	203	0.68	0.4632	< 0.00001	< 0.0005	2.23	< 0.01	< 0.001	51.5	< 0.0002	< 0.001	402.0	8.40
Annual Average*											**0.000005**				**0.000875**					

- Half the detection limit was used when calculating the average

	Ammonia	Alkalinity	Al	Cd	Cl	Cr	Co	Hardness	Fe	Mn	Hg	Mo	Nitrate	P	Se	Sulphate	Tl	U	Conductivity	T°	pH	O_2	O_2	As	Cu	CN	Pb	Ni	Ra226	TSS	Zn
	mg N/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	g $CaCO_3$	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C		%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Bq/L	mg/L	mg/L
Water Quality Monitoring Exposure Area (65°23'54.4'' N 96°44'21.6''W) (EEM-7-MAME-2)																															
26-Apr-20	0.2	25	0.006	< 0.00002	45	0.0017	< 0.0005	87	0.02	0.0721	< 0.00001	0.0012	1.15	< 0.01	< 0.001	16.6	< 0.0002	< 0.001	251.1	0.72	6.85	89.4	12.42	0.0015	0.0011	0.003	< 0.0003	0.0033	0.005	2	< 0.001
24-May-20	0.25	27	< 0.006	< 0.00002	46.6	0.0008	< 0.0005	92	0.04	0.061	< 0.00001	0.0014	1.05	< 0.01	< 0.001	18	< 0.0002	< 0.001	278.7	0.78	6.75	91.5	12.69	0.0015	0.0013	0.004	< 0.0003	0.0036	0.005	< 1	< 0.001
24-Aug-20	0.16	17	< 0.006	< 0.00002	24.4	< 0.0006	< 0.0005	-	0.05	0.039	< 0.00001	0.0006	9.44	< 0.01	< 0.001	15.5	< 0.0002	< 0.001	165.9	10.38	6.58	99.6	10.79	0.001	< 0.0005	0.002	< 0.00017	0.0021	0.002	4	< 0.001
2-Sep-20	0.11	51	< 0.006	< 0.00002	25.2	< 0.0006	< 0.0005	71	0.04	0.0483	< 0.00001	< 0.0005	0.89	< 0.01	< 0.001	17.5	< 0.0002	< 0.001	164.6	10.20	7.46	98.8	10.29	< 0.0005	< 0.0005	< 0.001	< 0.00017	0.0013	< 0.002	1	< 0.001
Water Quality Monitoring Reference Area (65°58'10.90'' N 96°09'51.37'' W) (ST-EEM-TPS)																															
26-Apr-20	0.01	10	< 0.006	< 0.00002	0.9	0.0009	< 0.0005	13	< 0.01	0.0011	< 0.00001	< 0.0005	0.01	< 0.01	< 0.001	5.4	< 0.0002	< 0.001	32.2	0.29	6.87	116.4	16.76	< 0.0005	0.0006	< 0.001	< 0.0003	0.0005	0.011	< 1	0.002
24-May-20	< 0.01	10	< 0.006	< 0.00002	1	< 0.0006	< 0.0005	9	< 0.01	< 0.0005	< 0.00001	< 0.0005	< 0.01	< 0.01	< 0.001	5.1	< 0.0002	< 0.001	30.5	1.29	6.92	115.6	16.04	< 0.0005	< 0.0005	0.001	< 0.0003	< 0.0005	< 0.002	< 1	< 0.001
2-Sep-20	0.01	43	< 0.006	< 0.00002	0.7	< 0.0006	< 0.0005	9	< 0.01	0.0011	< 0.00001	< 0.0005	< 0.01	< 0.01	< 0.001	3.5	< 0.0002	< 0.001	26.4	10.09	6.69	106.1	11.78	< 0.0005	< 0.0005	< 0.001	< 0.00017	< 0.0005	< 0.002	1	< 0.001

8.3.2.5 *ST-MDMER-8*

The fourth FDP is the Whale Tail Attenuation Pond discharged to Mammoth Lake via the submerged East Diffuser to control erosion and disturbance to bottom sediments – ST-MDMER-8. ST-MDMER-8 intake is in the Whale Tail Attenuation pond and the FPD is at the shore of Mammoth Lake. This FDP was in operation on June 17 to July 5, July 7 to July 23, July 25 to August 5, August 7 to September 13, and September 15 to October 7. The results are presented in Table 8-10 below. There were no non compliance associated with this discharge in 2020. The total volume of water discharge via this diffuser in 2020 was 1,161,165 m^3, Table 8-11 presents the daily discharge volumes.

The water quality samples were taken from the discharge location (ST-MDMER-8), the receiving environment exposure area (EEM-7-MAME-2) and reference area (TPS or ST-MMER-1-EEM-TPS). These sampling locations are highlighted on Figures 2 and 4. Results of the EEM water quality monitoring program are presented in Tables 8-12. This data was previously reported to Environment Canada via the MERS electronic database reporting system

8.3.2.6 *ST-MDMER-10*

No effluent was discharges in 2020 from this FDP. This FDP is still active on MERS.

8.3.2.7 *ST-MDMER-11*

The seventh FDP is ST-MDMER-11 which represents the discharge from the Whale Tail Attenuation Pond to Whale Tail South via the permanent diffuser to control erosion and disturbance to bottom sediments. The sampling point for this FDP is at the header after the WTP. Discharge from this FDP occurred from November 6 to December 2, December 5 to December 14, and December 27 to December 31. The results are presented in Table 8-13. Two MDMER non-compliance occurred at the FDP in 2020:

- On November 16th, Agnico conducted water quality monitoring as required by Section 12 (1) of the MDMER regulation. Radium 226 and cyanide were not analyzed for the weekly ST-MDMER-11 effluent sample. Cyanide is not required for Whale Tail as per Section 12 (3) but is conducted as due diligence.

  Upon review of the results, a request to provide the missing parameter results was sent to the accredited laboratory on December 22nd and this is when we were made aware of the situation. The sample was received by the lab with all the associated bottles for the analysis required, however there was an error in the analysis request and therefore Ra226 and cyanide were not analyzed. The lab should have notified Agnico of the issues with the request as the bottles sent did not match the request they received. The lab did not notify Agnico of the discrepancies as required upon receipt of the sample.

  The lab informed that there was not enough sample left to complete the analysis of Ra226 or cyanide as they do not keep any extra bottles that are received.

  The issue has been discussed and addressed between Agnico Eagle and the lab who was responsible for advising our group properly when there are discrepancies between the analysis request and the number of bottles received. Discussions with the field technicians will take place to stress the importance of the regulatory samples and overall requirements. This will ensure compliance to the MDMER regulation in the future. ECCC inspector was notified on December 22nd, 2020.

- No sample was collected as per MDMER Section 12(1) for the Whale Tail Attenuation Pond discharge to Whale Tail South (ST-MDMER-11) during the week of December 13 to 19. The regulatory sample was planned for December 14th; however the discharge was stopped early in the morning (2:00am) and remained off for the week, therefore the sample was not collected.

  The discharge was shutdown due to increasing Turbidity/TSS trends in the Whale Tail Attenuation Pond raw water (before treatment) caused by the water level in the attenuation pond getting lower. To ensure optimal water treatment, the water treatment plant and the discharge were stopped as a preventive measure. Attempts to restart the discharge by the end of the week was done however, when the discharge was to be restarted it was noticed that there was a buildup of sediment in the tanks. Before starting the discharge, the sediment buildup needed to be addressed. ECCC inspector was notified on December 22nd, 2020.

The total volume of water discharge from the FDP in 2020 was 341,420 m^3, the daily discharge volumes are presented in Table 8-14.

The water quality samples were taken from the discharge location (ST-MDMER-11), the receiving environment exposure area (WTSE-1) and reference area (TPS or ST-MMER-1-EEM-TPS). These sampling locations are highlighted on Figures 2 and 4. Results of the EEM water quality monitoring program are presented in Tables 8-15. This data was previously reported to Environment Canada via the MERS electronic database reporting system

Table 8-10 ST-MDMER-8 2020 MDMER Monitoring

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
January											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
February											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
March											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
April											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
May											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
June											
17-Jun-20	0.0085	0.0009	0.015	< 0.0003	0.0266	0.012	3	0.033	6.68	0	0
22-Jun-20	0.010	0.0071	0.036	< 0.0003	0.0273	0.012	8	0.028	6.79	0	0
29-Jun-20	0.0075	0.0043	0.038	< 0.0003	0.0215	0.015	6	0.037	6.83	NMR	NMR
July											
7-Jul-2020	0.0047	0.0048	0.037	< 0.0003	0.0217	0.009	6	0.043	6.60	NMR	NMR
12-Jul-2020	0.0041	0.0027	0.021	< 0.0003	0.0218	0.003	4	0.028	7.22	10	0
19-Jul-2020	0.0023	0.0048	0.050	< 0.0003	0.0244	0.008	5	0.022	7.10	NMR	NMR
26-Jul-2020	0.0010	0.0034	0.012	< 0.0003	0.0146	0.012	4	0.031	7.10	NMR	NMR
August											
3-Aug-2020	0.0015	0.0038	0.015	< 0.0003	0.0227	0.011	4	0.026	6.89	0	0
10-Aug-2020	0.0010	0.0022	0.017	< 0.00017	0.0071	0.006	7	0.015	7.14	NMR	NMR
17-Aug-2020	0.0028	< 0.0005	0.006	< 0.00017	0.0108	0.009	5	0.007	6.99	NMR	NMR
25-Aug-2020	0.0033	0.0036	0.028	< 0.00017	0.0176	0.017	5	0.023	6.80	NMR	NMR
September											
1-Sept-2020	0.0038	0.0008	0.020	< 0.00017	0.0242	0.006	3	0.023	6.14	0	0
7-Sept-2020	0.0037	0.0007	0.008	< 0.00017	0.0226	0.009	3	0.008	7.04	NMR	NMR
16-Sept-2020	0.0030	0.0036	0.016	< 0.00017	0.0303	0.013	8	0.042	7.02	NMR	NMR
21-Sept-2020	0.0023	0.0008	0.004	< 0.00017	0.0212	0.011	2	< 0.002	6.87	NMR	NMR
28-Sept-2020	< 0.0005	< 0.0005	0.002	< 0.00017	0.0080	0.005	8	0.013	7.02	NMR	NMR
October											
2-Oct-20	NMR	NMR	NMR	< NMR	NMR	NMR	3	NMR	7.03	NMR	NMR
5-Oct-20	0.0055	0.0016	0.019	< 0.00017	0.0216	0.002	4	0.022	7.01	0	0
7-Oct-20	NMR	NMR	NMR	< NMR	NMR	NMR	3	NMR	7.22	NMR	NMR
November											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
December											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP

NDEP :No Deposit

NMR: No Measurement Required

Table 8-11 ST-MDMER-8 2020 Volume

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
1	0	0	0	0	0	0	3,875	8,220	10,895	9,726	0	0	
2	0	0	0	0	0	0	9,777	6,474	12,543	9,650	0	0	
3	0	0	0	0	0	0	13,189	5,863	12,650	9,581	0	0	
4	0	0	0	0	0	0	14,788	6,372	12,140	9,526	0	0	
5	0	0	0	0	0	0	14,836	4,728	12,548	8,768	0	0	
6	0	0	0	0	0	0	0	0	11,685	9,193	0	0	
7	0	0	0	0	0	0	15,175	4,044	10,340	8,389	0	0	
8	0	0	0	0	0	0	16,524	8,044	10,348	0	0	0	
9	0	0	0	0	0	0	16,268	11,263	7,988	0	0	0	
10	0	0	0	0	0	0	16,749	11,117	8,341	0	0	0	
11	0	0	0	0	0	0	16,848	11,002	7,902	0	0	0	
12	0	0	0	0	0	0	15,012	9,010	7,738	0	0	0	
13	0	0	0	0	0	0	12,729	8,675	3,465	0	0	0	
14	0	0	0	0	0	0	13,194	10,813	0	0	0	0	
15	0	0	0	0	0	0	12,582	14,588	2,724	0	0	0	
16	0	0	0	0	0	0	12,694	12,504	11,512	0	0	0	
17	0	0	0	0	0	9,451	12,566	14,633	13,835	0	0	0	
18	0	0	0	0	0	10,131	12,867	13,202	13,231	0	0	0	
19	0	0	0	0	0	8,933	10,037	13,426	13,318	0	0	0	
20	0	0	0	0	0	13,210	9,803	11,250	12,114	0	0	0	
21	0	0	0	0	0	14,397	5,047	11,644	12,761	0	0	0	
22	0	0	0	0	0	10,996	7,645	13,081	14,452	0	0	0	
23	0	0	0	0	0	11,397	2,644	12,447	15,085	0	0	0	
24	0	0	0	0	0	11,787	0	12,479	13,792	0	0	0	
25	0	0	0	0	0	11,245	2,352	10,777	11,605	0	0	0	
26	0	0	0	0	0	14,342	7,066	9,249	8,140	0	0	0	
27	0	0	0	0	0	14,233	7,968	8,596	7,514	0	0	0	
28	0	0	0	0	0	13,820	9,852	6,377	9,127	0	0	0	
29	0		0	0	0	13,744	10,679	7,719	9,675	0	0	0	
30	0		0	0	0	13,698	9,397	9,728	9,721	0	0	0	
31	0		0		0		9,442	8,835		0		0	
Total (m^3)	**0**	**0**	**0**	**0**	**0**	**171,383**	**321,603**	**296,160**	**307,187**	**64,832**	**0**	**0**	**1,161,165**

Table 8-12 ST-MDMER-8 2020 EEM Monitoring

	Ammonia	Alkalinity	Al	Cd	Cl	Cr	Co	Hardness	Fe	Mn	Hg	Mo	Nitrate	P	Se	Sulphate	Tl	Ur	Conductivity	T°	Sub-Lethal Toxicity			
	mg N/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C	*Ceriodaphia dubia*	*Fathead minnow*	*Lemna minor*	*Pseudokirchneriella subcapitata*
Effluent characterization (65°23'51.44'' N 96°44'06.13'' W) (ST-MDMER-8-EEM)																								
17-Jun-20	1.15	34	0.036	< 0.00002	46.2	< 0.0006	< 0.0005	146	0.54	0.4723	< 0.00001	< 0.0005	3.05	< 0.01	< 0.001	34.6	< 0.0002	< 0.001	307	2.3	NMR	NMR	NMR	NMR
22-Jun-20	2.01	38	0.02	< 0.00002	52.3	< 0.0006	0.0021	157	0.38	0.5255	< 0.00001	0.0032	2.96	< 0.01	< 0.001	35.8	< 0.0002	< 0.001	376	3.7	NMR	NMR	NMR	NMR
07-Jul-20	1.8	44	< 0.006	< 0.00002	61.7	< 0.0006	0.0027	162	0.59	0.5438	< 0.00001	0.0035	3.39	< 0.01	< 0.001	39	< 0.0002	< 0.001	423.6	10.5	NMR	NMR	NMR	NMR
26-Jul-20	1.3	42	< 0.006	< 0.00002	48.3	< 0.0006	0.0017	151	0.41	0.3755	< 0.00001	0.0049	2.29	< 0.01	< 0.001	46.3	< 0.0002	< 0.001	353.0	12.00	Without AL and With SE	Without AL and without SE	Without SE	Without SE
01-Sep-20	1.03	53	0.033	< 0.00002	66.7	0.0011	0.0029	195	0.38	0.5683	< 0.00001	0.0048	2.33	< 0.01	< 0.001	60.7	< 0.0002	0.001	428.0	7.50	With SE and Without AL	Without SE and Without AL	With SE	Without SE
** 5-Oct-20	0.92	54	0.045	< 0.00002	54.2	0.0014	NA	NA	0.64	0.4777	< 0.00001	0.0035	1.43	< 0.1	< 0.0005	43.5	< 0.0002	< 0.001	359.0	2.10	NMR	NMR	NMR	NMR
*** Annual Average**											**0.000005**				**0.000375**									

* Half the detection limit was used when calculating the average
NMR: No measure requirement
SE: Sub-Lethal effects
AL: Acute Lethality
** used sample results for ST-WT-2a Water Licence sample

	Ammonia	Alkalinity	Al	Cd	Cl	Cr	Co	Hardness	Fe	Mn	Hg	Mo	Nitrate	P	Se	Sulphate	Tl	Ur	Conductivity	T°	pH	O_2	O_2	As	Cu	CN	Pb	Ni	Ra226	TSS	Zn
	mg N/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C		%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Bq/L	mg/l	mg/L
Water Quality Monitoring Exposure Area (65°23'54.4'' N 96°44'21.6''W) (EEM-7-MAME-2)																															
2-Aug-20	0.11	47	< 0.006	< 0.00002	23.8	< 0.0006	< 0.0005	68	0.05	0.0216	< 0.00001	0.0012	0.85	0.01	< 0.001	14.4	< 0.0002	< 0.001	146.8	14.82	7.37	101.7	9.97	0.0018	0.0007	0.001	< 0.0003	0.0031	0.005	2	< 0.001
2-Sep-20	0.11	51	< 0.006	< 0.00002	25.2	< 0.0006	< 0.0005	71	0.04	0.0483	< 0.00001	< 0.0005	0.89	< 0.01	< 0.001	17.5	< 0.0002	< 0.001	164.6	10.20	7.46	98.8	10.29	< 0.0005	< 0.0005	< 0.001	< 0.00017	0.0013	< 0.002	1	< 0.001
Water Quality Monitoring Reference Area (65°58'10.90'' N 96°09'51.37'' W) (ST-EEM-TPS)																															
2-Aug-20	< 0.01	10	0.082	< 0.00002	< 0.5	< 0.0006	< 0.0005	< 1	< 0.01	< 0.0005	< 0.00001	< 0.0005	< 0.01	< 0.01	< 0.001	< 0.6	< 0.0002	< 0.001	26.0	8.84	7.32	107.7	12.16	< 0.0005	< 0.0005	< 0.001	< 0.0003	< 0.0005	< 0.002	< 1	< 0.001
2-Sep-20	0.01	43	< 0.006	< 0.00002	0.7	< 0.0006	< 0.0005	9	< 0.01	0.0011	< 0.00001	< 0.0005	< 0.01	< 0.01	< 0.001	3.5	< 0.0002	< 0.001	26.4	10.09	6.69	106.1	11.78	< 0.0005	< 0.0005	< 0.001	< 0.00017	< 0.0005	< 0.002	1	< 0.001

Table 8-13 ST-MDMER-11 2020 MDMER Monitoring

Month	As mg/L	Cu mg/L	CN mg/L	Pb mg/L	Ni mg/L	Zn mg/L	TSS mg/L	Ra 226 mg/L	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
January											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
February											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
March											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
April											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
May											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
June											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
July											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
August											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
September											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
October											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
November											
6-Nov-20	NMR	NMR	NMR	< NMR	NMR	NMR	4	NMR	7.26	NMR	NMR
7-Nov-20	0.0021	0.0038	0.040	< 0.00017	0.0054	0.004	3	0.010	7.11	NMR	NMR
8-Nov-20	NMR	NMR	NMR	< NMR	NMR	NMR	4	NMR	7.09	NMR	NMR
9-Nov-20	0.0019	0.0041	0.043	< 0.00017	0.0067	0.007	< 1	0.023	7.20	NMR	NMR
10-Nov-20	NMR	NMR	NMR	< NMR	NMR	NMR	2	NMR	7.13	NMR	NMR
11-Nov-20	NMR	NMR	NMR	< NMR	NMR	NMR	1	NMR	7.11	NMR	NMR
13-Nov-20	NMR	NMR	NMR	< NMR	NMR	NMR	3	NMR	7.33	NMR	NMR
16-Nov-20	0.0012	< 0.0005	NMR	< 0.00017	0.0045	0.009	3	NA*	7.25	0	0
18-Nov-20	NMR	NMR	NMR	< NMR	NMR	NMR	2	NMR	7.60	NMR	NMR
20-Nov-20	NMR	NMR	NMR	< NMR	NMR	NMR	6	NMR	7.56	NMR	NMR
23-Nov-20	0.0013	0.0011	0.014	< 0.00017	0.0035	< 0.001	4	0.011	7.33	NMR	NMR
December											
1-Dec-20	0.016	0.00060	0.003	< 0.00017	0.0029	0.011	< 1	0.007	6.83	0	0
2-Dec-20	NMR	NMR	NMR	< NMR	NMR	NMR	5	NMR	6.91	NMR	NMR
7-Dec-20	0.0017	< 0.0005	0.019	< 0.00017	0.0039	< 0.001	2	0.013	7.20	NMR	NMR
9-Dec-20	NMR	NMR	NMR	< NMR	NMR	NMR	1	NMR	7.46	NMR	NMR
11-Dec-20	NMR	NMR	NMR	< NMR	NMR	NMR	7	NMR	7.32	NMR	NMR
14-Dec-20	NA**	NA**	NMR	NA**	NA**	NA**	NA**	NA**	NA**	NMR	NMR
21-Dec-20	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
27-Dec-20	0.0020	0.0005	0.004	< 0.00017	0.0048	0.003	4	0.022	6.71	NMR	NMR
30-Dec-20	0.0020	0.0005	0.004	< 0.00017	0.0048	0.003	12	0.022	6.68	NMR	NMR

NDEP :No Deposit

NMR: No Measurement Required
NA: Not available. Weekly sample missed

Table 8-14 ST-MDMER-11 2020 Volume

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
1	0	0	0	0	0	0	0	0	0	0	0	7,840	
2	0	0	0	0	0	0	0	0	0	0	0	3,041	
3	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	0	3,909	
6	0	0	0	0	0	0	0	0	0	0	5,663	8,724	
7	0	0	0	0	0	0	0	0	0	0	10,205	8,651	
8	0	0	0	0	0	0	0	0	0	0	8,240	8,571	
9	0	0	0	0	0	0	0	0	0	0	9,220	8,458	
10	0	0	0	0	0	0	0	0	0	0	8,883	8,389	
11	0	0	0	0	0	0	0	0	0	0	8,375	8,209	
12	0	0	0	0	0	0	0	0	0	0	8,240	7,923	
13	0	0	0	0	0	0	0	0	0	0	8,167	7,878	
14	0	0	0	0	0	0	0	0	0	0	8,311	590	
15	0	0	0	0	0	0	0	0	0	0	7,755	0	
16	0	0	0	0	0	0	0	0	0	0	7,333	0	
17	0	0	0	0	0	0	0	0	0	0	7,365	0	
18	0	0	0	0	0	0	0	0	0	0	6,922	0	
19	0	0	0	0	0	0	0	0	0	0	7,041	0	
20	0	0	0	0	0	0	0	0	0	0	7,159	0	
21	0	0	0	0	0	0	0	0	0	0	6,977	0	
22	0	0	0	0	0	0	0	0	0	0	9,506	0	
23	0	0	0	0	0	0	0	0	0	0	9,620	0	
24	0	0	0	0	0	0	0	0	0	0	7,827	0	
25	0	0	0	0	0	0	0	0	0	0	10,313	0	
26	0	0	0	0	0	0	0	0	0	0	9,234	0	
27	0	0	0	0	0	0	0	0	0	0	9,802	4,420	
28	0	0	0	0	0	0	0	0	0	0	9,852	10,238	
29	0		0	0	0	0	0	0	0	0	9,706	10,179	
30	0		0	0	0	0	0	0	0	0	10,085	11,723	
31	0		0		0		0	0		0		10,878	
Total (m^3)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**211,801**	**129,620**	**341,420**

Table 8-15 ST-MDMER-11 2020 EEM Monitoring

	Ammonia	Alkalinity	Al	Cd	Cl	Cr	Co	Hardness	Fe	Mn	Hg	Mo	Nitrate	P	Se	Sulphate	Tl	U	Conductivity	T°
	mg N/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C
Effluent characterization (65°23'51.30''N 96°40'49.00'' W) (ST-MDMER-11-EEM)																				
9-Nov-20	2.1	57	0.038	0.00003	36	< 0.0006	0.0013	116	0.53	0.2299	< 0.00001	0.0066	3.31	< 0.04	0.0009	25.7	< 0.0002	< 0.001	297.0	0.90
23-Nov-20	0.79	56	0.032	< 0.00002	35.4	< 0.0006	0.0011	102	0.6	0.2397	< 0.00001	0.0048	0.77	< 0.01	< 0.0005	28.6	< 0.0002	< 0.001	235.0	0.70
7-Dec-20	0.98	62	< 0.005	< 0.00002	33.9	< 0.0006	0.0008	111	0.08	0.3346	< 0.00001	0.0054	0.98	< 0.01	< 0.0005	22.8	< 0.0002	< 0.001	223.0	0.80
***Annual Average**	-	-	-	-	-	-	-	-	-	-	**0.000005**	-	-	-	**0.000467**	-	-	-	-	-

* Half the detection limit was used in calculating the average

	Ammonia	Alkalinity	Aluminium	Cadmium	Chloride	Chromium	Cobalt	Hardness	Iron	Manganese	Mercury	Molybdenum	Nitrate	Phosphorus	Selenium	Sulphate	Thallium	Uranium	Conductivity	T°	pH	O_2	O_2	Arsenic	Copper	Cyanide	Lead	Nickel	Ra226	TSS	Zinc
	mg N/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C		mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	Bq/L	mg/L	mg/L
Water Quality Monitoring Exposure Area (65°23'45.88" N 96°41'16.21"W) (WTSE-1)																															
15-Nov-20	0.15	50	< 0.005	< 0.00002	14.4	< 0.0006	< 0.0005	43	0.09	0.0283	< 0.00001	< 0.0005	0.19	< 0.04	< 0.0005	6.3	< 0.0002	< 0.001	182.0	0.38	7.13	13.88	105.6	< 0.0005	< 0.0005	0.002	< 0.0003	0.0009	< 0.002	5	< 0.001
27-Dec-20	0.16	16	0.006	< 0.00002	16	< 0.0006	< 0.0005	35	0.13	0.0345	< 0.00001	< 0.0005	0.16	< 0.01	< 0.0005	5.4	< 0.0002	< 0.001	107.2	0.34	7	15.08	85	0.0006	0.0005	0.001	< 0.00017	0.0027	< 0.002	< 1	< 0.001
Water Quality Monitoring Reference Area (65°58'10.90'' N 96°09'51.37'' W) (ST-EEM-TPS)																															
15-Nov-20	< 0.005	31	< 0.005	< 0.00002	0.8	< 0.0006	< 0.0005	10	< 0.01	0.0011	< 0.00001	0.0006	< 0.01	< 0.04	< 0.0005	3.6	< 0.0002	< 0.001	26.8	0.45	6.84	15	105.5	< 0.0005	< 0.0005	< 0.001	< 0.00017	< 0.0005	< 0.002	< 1	< 0.001
* 28-Dec-20	< 0.01	8	< 0.005	< 0.00002	1	< 0.0006	< 0.0005	9	< 0.01	0.0008	< 0.00001	< 0.0005	< 0.01	< 0.01	< 0.0005	2.6	< 0.0002	< 0.001	27.8	0.46	6.71	16.76	117.50	< 0.0005	< 0.0005	< 0.001	< 0.00017	< 0.0005	< 0.002	< 1	< 0.001

T°, pH, O_2 and Conductivity took on the field by the environmental technician

SE: Sub-Lethal effects

AL: Acute Lethality

NA: in reduced frequency

* Samples did not meet hold times (plane was cancelled) received by lab on Jan 5

8.4 ENVIRONMENTAL BIOLOGICAL STUDY

8.4.1 Meadowbank Site - EEM Study Design Cycle 3 and 4

As required by ECCC, a Biological Monitoring Study (EEM Cycle 3 study) was conducted in 2017 to assess impact on fish and fish habitat of Wally Lake (Vault Discharge). The Vault discharge was at this time the effluent which has been determined as 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 17th, 2017 (Appendix G3 of the 2017 Annual Report). On April 10th, 2017 Agnico received comments from the Technical Advisory Panel (TAP) regarding the Cycle 3 study design. On April 26th, 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 of the 2018 Annual Report. On November 26th, 2019, Agnico have received comments from the TAP regarding the EEM Study 3 Interpretative Report and submitted response on March 3rd 2020 (Appendix 34). ECCC approval of the Environmental Effect Monitoring Study 3 Interpretative Report was received on May 21st, 2020.

As per the regulation, field work for the EEM Cycle 4th was to be conducted in 2020. EEM Cycle 4 Study Design was submitted to ECCC on March 2nd, 2020 and more details regarding the design submitted can be found in Appendix 35. Seepage water is collected along the East Dike and discharged to Second Portage Lake via outfall MDMER 3, but during Cycles 1, 2 and 3, the volume of that effluent was much less than that discharged to Third Portage or Wally Lakes, and so EEMs focused on those other discharges. Since the effluent discharge to Wally Lake ceased on October 9, 2017, the seepage water discharged to Second Portage Lake is the only final discharge point and is, by default, the Cycle 4 EEM exposure area under the MDMER. Comments on the study design were received on May 5th, 2020 and Agnico's response was submitted on June 1st, 2020 (Appendix 36). ECCC approval for this EEM Cycle 4 Study Design was received on June 15th, 2020. As required under the Metal and Diamond Mining Effluent Regulations (MDMER), the next interpretive report and biological monitoring data are due on July 1st, 2021.

Agnico Eagle will continue to provide KivIA and other regulators copies of reports and data submitted to ECCC via the Annual Report.

8.4.2 Whale Tail Site - EEM Study Design Cycle 1

During the Whale Tail dike construction, water was pumped from the area enclosed by sediment curtains to create an inflow and thus minimize dispersal of water from within the enclosed area, with increased suspended sediment concentrations, into the rest of Whale Tail Lake. That pumping began on July 27th , 2018, at which time Whale Tail Project was deemed by Environment and Climate Change Canada to be subject to the Metal and Diamond Mining Effluent Regulations (MDMER) under the Fisheries Act. The MDMER requires that a first study design for the biological studies be submitted to the Minister of the Environment not later than 12 months after the day on which a mine becomes subject to section 7 of the MDMER. On July 26th, 2019, Agnico have provided to ECCC the First EEM Biological Study Design. More details regarding the design submitted can be found in Appendix 39 of the 2019 Annual Report. Comments on the study design was received on February 10th, 2020 and Agnico's response was submitted on June 19th, 2020 (Appendix 37). ECCC approval for this EEM Cycle 1 Study Design was received on July 3rd, 2020. As required under the Metal and Diamond Mining Effluent Regulations (MDMER), the first interpretive report and biological monitoring data are due on July 27th, 2021.

Agnico Eagle will continue to provide KivIA 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-MEA1530 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-WTP1830 Schedule B, Item 18: ***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 and the Whale Tail Water Quality and Flow Monitoring Plan. 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 will be made available on request for Meadowbank and 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 2020, 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 20HCAA-00275 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 20HCAA-00275 Condition 3.1.1: ***Demonstration of effective implementation and functioning: Providing dated photographs and inspection reports to demonstrate effective implementation and functioning of mitigation measures and standards described above to limit the impacts to fish and fish habitat to what is covered by this authorization.***

And

As required by DFO Authorization 20HCAA-00275 Condition 3.1.2: ***Contingency measures: Providing 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.***

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 20HCAA-00275 Condition 3.2.1: ***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 16th, 2021, the 2020 Report on the Implementation of Measures to Avoid and Mitigates Serious Harm to Fish to addresses Conditions of the Whale Tail Fisheries Act Authorization 16HCAA-00370 and 20HCAA-00275.

The complete report is provided as Appendix 38.

This report was developed in fulfillment of Condition 3 of these FAAs, which relates to the monitoring and reporting of measures and standards to avoid and mitigate serious harm to fish.

In fulfillment of Condition 3.1, Section 2 of this document summarizes the implementation of a suite of DFO-specified measures and standards to avoid and mitigate serious harm to fish.

Section 3 of this report provides a summary of results for monitoring programs specified under Condition 2 of FAAs 16HCAA-00370 and 20HCAA-00275.

Based on results of these monitoring programs, Section 4 of this report provides details of any contingency measures that were required to be followed to prevent further impacts, in the event that existing mitigation did not function properly (in fulfillment of FAA 16HCAA-00370 Condition 3.1.4 and FAA 20HCAA-00275 Condition 3.1.2).

Finally, as required by FAA 16HCAA-00370 Condition 3.1.1, Section 5 further provides an evaluation of the effectiveness of the above-described monitoring programs (and other relevant monitoring programs) in validating changes to fish and fish habitat predicted in the Project FEIS.

In summary, all of the measures and standards to avoid and mitigate serious harm to fish, as identified in Condition 2 of FAA 16HCAA-00370 and 20HCAA-00275, were implemented in 2020. Based on the results of associated monitoring programs, no new contingency mitigation measures outside of the scope of existing management plans or previously identified seepage events were required in 2020 for the protection of fish and fish habitat (Section 4). These and other mitigation measures (see Appendix A of the appended report) were therefore considered effective in limiting impacts to fish and fish habitat to those predicted (Section 5) and authorized.

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.

In fulfillment of 16HCAA-00370 Condition 3.1.2 and 20HCAA-00275 Condition 3.2.1, Agnico organized a conference call with DFO and the Kivalliq Inuit Association on September 29th, 2020, to review the results of the previous year's program (2019 Technical Memorandum on Avoidance of Serious Harm to Fish and Fish Habitat – Whale Tail Project). During the call, DFO recommend Agnico to focused on explaining whether all required mitigation was implemented, identifying instances where supplemental mitigation was required, and what that mitigation was. The 2020 report provided in Appendix 38 intent to addressed these recommendation.

8.5.2 Dewatering Activities

8.5.2.1 *Meadowbank Site*

No dewatering activities occurred in 2020.

8.5.2.2 *Whale Tail Site*

8.5.2.2.1 Whale Tail Lake – North Basin Dewatering

Dewatering of Whale Tail North Basin began on March 5th, 2019, and was completed on May 15th, 2020. Effluent and receiving environment monitoring for dewatering was conducted according to the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering (Version 1, January, 2017). Complete results and discussion for 2019 activities are provided in the 2019 Annual Report. Results for 2020 are provided in the Water Quality Monitoring Report for Dike Construction and Dewatering (Appendix 39), and summarized here.

For the purposes of lake dewatering and as described in the Plan, water was discharged from Whale Tail North Basin to Whale Tail South Basin in 2020. Dewatering occurred from January 1 – 26, February 11 – 23, February 29 – March 8, March 15 – 22, and March 30 – April 3, April 15 – 20, April 25 – 30, and May 7 - 15. At that time, the dewatering of Whale Tail North was complete. Treatment of effluent for TSS at the water treatment plant (WTP) prior to discharge occurred throughout dewatering of Whale Tail North in 2020. No dewatering discharge of Whale Tail North to Mammoth Lake occurred in 2020.

According to the Plan, water quality monitoring was conducted primarily for effluent prior to discharge, but also included the receiving environment of Whale Tail South, as detailed below.

8.5.2.2.1.1Dewatering Effluent (ST-DD-7, ST-DD-9)

In accordance with the Plan, daily water quality samples were collected for Whale Tail North discharge (ST-DD-7) from the sampling valve located onshore prior to the diffuser location in Whale Tail South. Analysis at the commercial laboratory was completed on daily samples for TSS and weekly samples for total aluminum, according to NWB Type A Water License requirements.

Field-measured turbidity and pH were also recorded daily during dewatering for these stations, and TSS measurements were performed daily by the onsite assay lab for use in decision-making related to supplementary mitigation measures, as described in the full report (Appendix 39).

The short-term maximum and maximum monthly for turbidity, TSS, pH, and total aluminum from ST-DD-7 were compared to NWB Type A Water License Criteria, as listed in Part D Item 7 (Table 8-16).

Table 8-16 Maximum allowable water quality concentrations for effluent from dewatering of Whale Tail North Basin according to NWB Type A Water License 2AM- WTP1826 Part D Item 7.

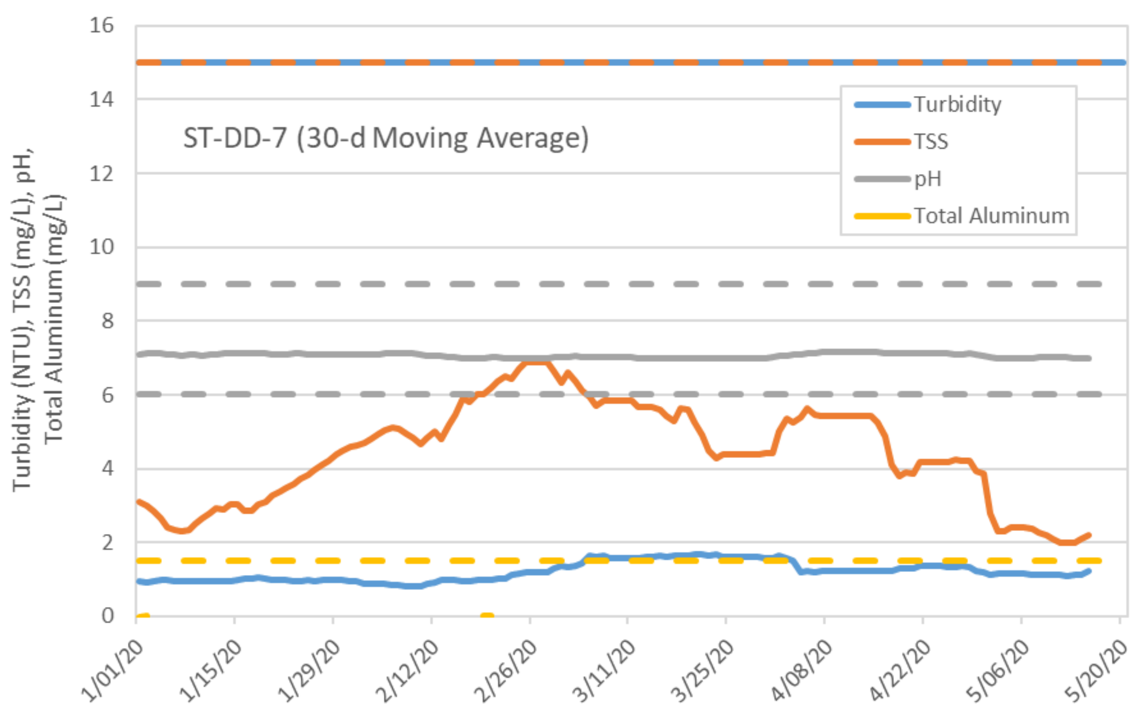
Parameter	Maximum Monthly Mean (MMM)	Short Term Maximum (STM)
Total Suspended Solids^	15 mg/L	22.5 mg/L
Turbidity*	15 NTU	30 NTU
pH*	6.0 – 9.0	6.0 – 9.0
Total Aluminum^	1.5 mg/L	3.0 mg/L

*Field-measured
^Laboratory-measured

Throughout monitoring in 2020 for Whale Tail Lake dewatering, no exceedances of NWB Type A Water License criteria occurred for the STM or MMM (Figure 16).

No single samples for TSS measured daily by the onsite assay laboratory exceeded trigger values for supplementary mitigation according to the Plan, so no additional management actions were required to be implemented.

Figure 16. Calculated 30-d moving averages for turbidity, TSS, pH, and total aluminum in dewatering effluent from Whale Tail North Basin. Dashed lines indicate the NWB Water License criteria for the Maximum Monthly Mean for comparison to 30-d moving averages (for pH, a range of 6-9).



8.5.2.2.1.2 Receiving Environment (ST-DD-8)

For Whale Tail Lake dewatering, water samples were collected weekly (weather permitting) in the receiving environment at a distance of 30-100 m from water discharge locations (ST-DD-8 in Whale Tail South Basin).

Receiving environment samples were analyzed in the field for turbidity, TSS, and conventional parameters. Laboratory analyses were also completed for TSS.

These values were not required to be reported monthly to NWB for compliance purposes, but results of laboratory analyses for TSS were compared to CCME guidelines, for reference. No exceedances occurred.

8.5.2.2.1.3 Lake Level Monitoring

As a component of monitoring under the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering, water levels in Mammoth Lake and Whale Tail South were surveyed at locations of sufficient distance from their outlets to limit potential lake level drawdown effects. Piezometers were installed in Whale Tail South for the purposes of water level analysis, and measurements were recorded every 3 – 6 hours beginning on February 19th, 2019. Piezometers were also installed in Mammoth Lake, and measurements were recorded at 3-h intervals beginning January 14th, 2020.

Water levels have also been recorded in Whale Tail South and Mammoth Lake by GPS survey beginning August 3rd, 2018. Frequency of these GPS surveys has varied from daily to monthly.

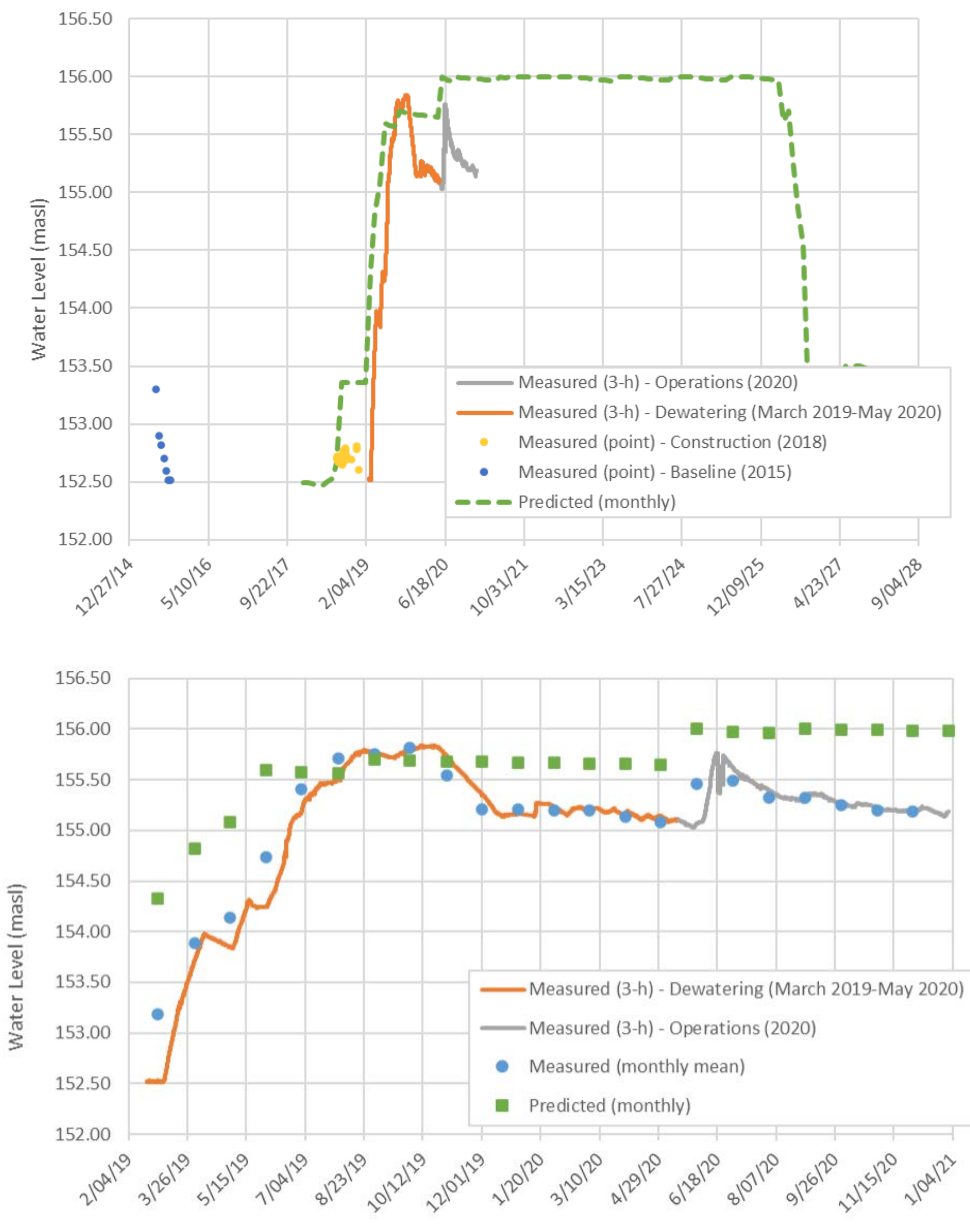
8.5.2.2.1.3.1 Whale Tail Lake

Water levels in Whale Tail South as measured throughout 2019 and 2020 using piezometric data are shown in Figure 17a and 17b, along with measurements during the construction phase (2018; measured by GPS survey during open water), available baseline measurements (2015), and FEIS predictions (from FEIS Addendum Appendix 6-O, Table D-14). Figure 17a shows the long-term trend in predicted water levels in relation to available baseline, dewatering- and operations-phase measurements. However, it is noted that FEIS-predicted water levels were calculated as monthly timesteps in a mean annual water balance, whereas measured water levels are assessed every 3 hours. Measured values may therefore be expected to vary around the prediction, due to both inter-annual climate variability and scale of measurement. Figure 17b more closely examines this variability for the period since flooding began (2019), and demonstrates in particular how the very rapid flood peak that is observed during freshet with daily water level measurements is substantially smoothed when monthly means are plotted.

Due to record rainfall, peak water levels in 2019 exceeded predictions in July (up to 155.8 masl), but did not reach the maximum predicted final flood level of 156.0 masl, which was planned to occur in 2020 (Figure 1a). Following discussions with NWB, Agnico pumped in 2019 non-contact water from the Whale Tail South flood zone directly to Mammoth Lake. This activity temporarily substituted for the passive flow which now occurs through the South Whale Tail Channel (SWTC). The SWTC was constructed from December 2019 – April, 2020 to direct water from the flooded lake A20 to Mammoth Lake. During freshet in 2020, water flowed through the SWTC as planned.

In 2020, water levels in Whale Tail South peaked at 155.7 masl on June 17th, and declined post-freshet to a low of 155.1 masl on December 27th. These water levels were lower than FEIS model results, which predicted a level of 156.0 masl would be maintained throughout the operations period. This change follows an amendment to the final design of the South Whale Tail Channel, which included a decrease in the original inlet elevation by 0.5 m, to 155.3 masl. Operational water levels moving forward are therefore predicted to be lower than the 156.0 masl mark.

Figure 17a and b. Measured (3-h interval and monthly mean, as indicated) and predicted water levels in the Whale Tail South flood zone. Predicted water levels from FEIS Addendum for the Whale Tail Pit Expansion Project, Appendix 6-O, Table D-14. Monthly mean water levels are plotted by the month start date.



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8.5.2.2.1.3.2 Mammoth Lake

Water levels in Mammoth Lake as measured primarily throughout the open water seasons of 2018 (construction period) and 2019 (dewatering period) by GPS survey are shown in Figure 18, along with available baseline measurements (2015) and 2020 piezometer results.

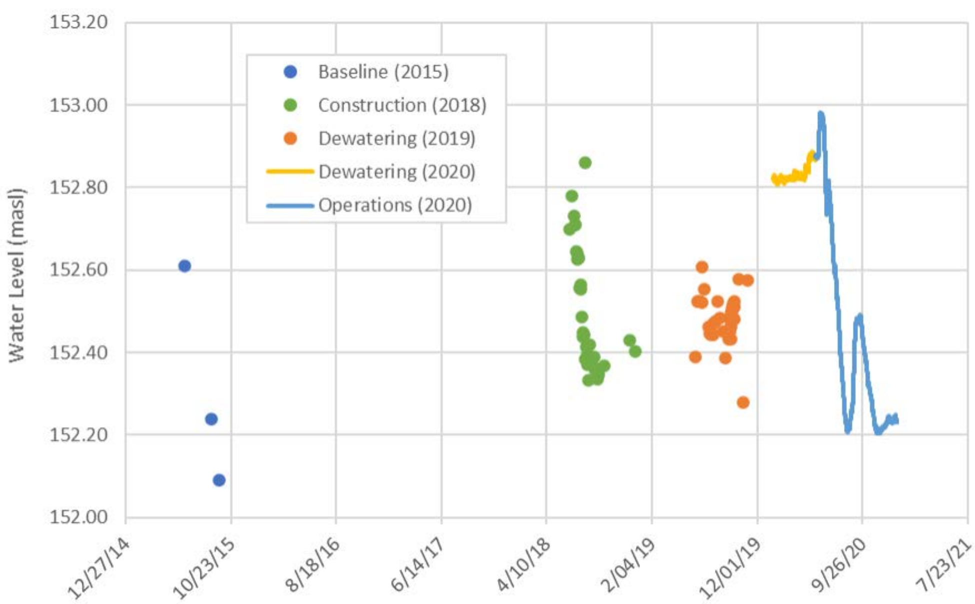
As shown in Table 8-17, FEIS predictions (Agnico Eagle, 2016 - FEIS Appendix 6-E) indicated that mean monthly water levels in Mammoth Lake would decline up to 16 cm below baseline during the construction phase (2018), and 12 cm below baseline during the dewatering phase (2019). Predictions for the operations phase (2020 – 2025) were updated in the FEIS Addendum (Volume 6, Section 6.3.3.1.4.2, Table 6.3-3) and indicated that mean monthly water levels may increase up to 5 cm from baseline, prior to a decline during closure (2026 – 2051).

Modeled mean monthly baseline water levels were not specified in the FEIS documents, and measured baseline data for Mammoth Lake is only available for 3 time points in 2015. As a result, quantitative comparison of measured values to FEIS predictions is difficult. However to date, measured water levels have not declined below available baseline values measured in 2015.

Table 8-17 Predicted change in water levels from baseline in Mammoth Lake during the construction and dewatering phases (from FEIS Appendix 6-E) and operations phase (from FEIS Addendum Section 6.3.3.1.4.2, Table 6.3-3) under mean monthly discharge scenarios.

Project Phase	June	July	August	September	October
Construction (m)	-0.16	-0.16	-0.11	-0.14	-0.13
Dewatering (m)	-0.12	-0.04	-0.05	-0.09	-0.10
Operations (m)	+0.05	+0.02	+0.03	+0.04	+0.03
Closure (m)	-0.20	-0.20	-0.14	-0.14	-0.13

Figure 18 Measured water levels in Mammoth Lake. Results from 2015 – 2019 are by GPS survey, and results for 2020 are from piezometric data (3-h intervals).



8.5.2.2.2 IVR Area Dewatering

Dewatering of the IVR area waterbodies occurred in August and September 2020. Effluent and receiving environment monitoring for dewatering was conducted according to the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering (Version 3, May 2020). Complete results of this monitoring are provided in the Water Quality Monitoring Report for Dike Construction and Dewatering (Appendix 39), and summarized here.

The dewatering of waterbodies in the footprint of the future IVR Pit began in August 2020 and was completed in September 2020. These waterbodies included A46, A47, A49, and A-P68. Water from these waterbodies was pumped to the Whale Tail Attenuation Pond as per the approved Dewatering Phase Pumping System Design Report, and monitoring under the Plan was not required.

Dewatering of waterbodies A50, A51 and A53 (in the footprint of the future IVR Waste Rock Storage Facility and Attenuation Pond) occurred in September. As per the approved Dewatering Phase Pumping System Design Report, dewatering effluent from A50 and A51 was sent to Lake A53 and then discharged to Whale Tail South, if it met the discharge criteria, or the Whale Tail Attenuation Pond if water quality was not suitable for direct discharge to the environment. Discharge of A53 to Whale Tail South, without treatment, occurred from September 1 to September 14 and monitoring under this Plan occurred. From September 15 to September 27, water from A53 was sent to the Whale Tail Attenuation Pond and managed as part of this facility.

Two additional ponds (A-P21 and A52) were planned to be dewatered, but were found to be dry during the 2020 season.

According to the Plan, water quality monitoring was conducted primarily for effluent prior to discharge, but also included the receiving environment of Whale Tail South, as detailed below.

8.5.2.2.2.1Dewatering Effluent (ST-DD-15)

In accordance with the Plan, daily water quality samples were collected for A53 discharge (ST-DD-15) from the sampling valve located onshore prior to the diffuser location in Whale Tail South. Analysis at the commercial laboratory was completed on daily samples for TSS, according to NWB Type A Water License requirements (Table 8-18).

Field-measured turbidity and pH were also recorded daily during dewatering for this station, and TSS measurements were performed daily by the onsite assay lab for use in decision-making related to supplementary mitigation measures, as described in the Plan.

Table 8-18 Maximum allowable water quality concentrations for effluent from dewatering of the IVR waterbodies according to NWB Type A Water License 2AM-WTP1830 Part D Item 8.

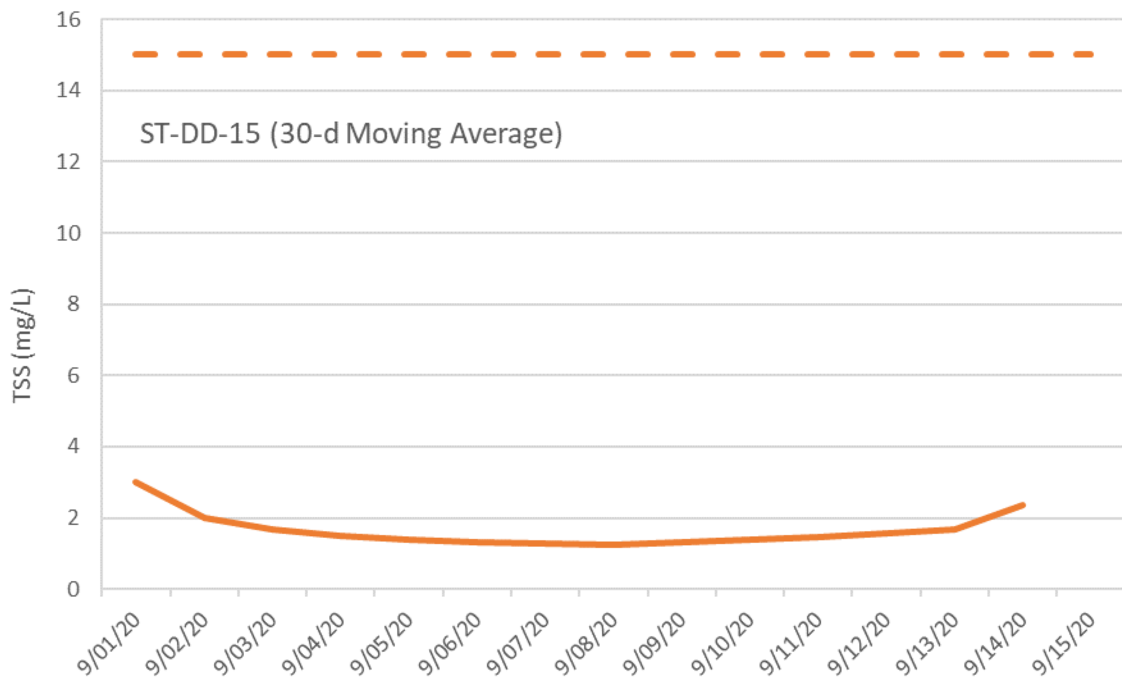
Parameter	Maximum Monthly Mean (MMM)	Short Term Maximum (STM) Grab Sample
Total Suspended Solids^	15 mg/L	30.0 mg/L

^Laboratory-measured

Throughout monitoring in 2020 for the IVR area dewatering, no exceedances of NWB Type A Water License criteria occurred for the STM or MMM (Figure 19).

No single samples for TSS measured daily by the onsite assay laboratory exceeded trigger values for supplemental mitigation, so no additional management actions were required to be implemented during dewatering.

Figure 19 Calculated 30-d moving average for TSS in dewatering effluent from Lake A53. Dashed line indicates the NWB Water License criteria for the Maximum Monthly Mean for comparison to the 30-d moving average



8.5.2.2.2.2Receiving Environment (ST-DD-8)

For IVR area dewatering, water samples were collected weekly (weather permitting) in the receiving environment at a distance of 30-100 m from water discharge locations (ST-DD-8 in Whale Tail South Basin).

Receiving environment samples were analyzed in the field for turbidity, TSS, and conventional parameters. Laboratory analyses were also completed for TSS.

These values were not required to be reported monthly to NWB for compliance purposes, but results of laboratory analyses for TSS were compared to CCME guidelines, for reference. No exceedances occurred.

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 2020 Water Management Plan and Report (Appendix 11).

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 91,040 m^3 of water was transferred from the Stormwater Management Pond to the TSF South Cell in July, August, 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 8-19 and Table 8-20 respectively; the sampling location is illustrated on Figure 1.

In June, TSS results for both stations did not exceed the maximum allowable grab sample concentration (30 mg/L) permitted by the Water License, Part F, Item 7. However, both stations did exceeded the maximum average concentration (15 mg/L). Only a monthly sample during open water season is required by the Water License, and thus, the average concentration is made only of this result on June 17th from the certified laboratory. Daily TSS analysis performed at the onsite laboratory showed that TSS remained below 5 mg/L for most of the month of June. In no case, internal analyses have showed results exceeding the maximum allowable grab sample.

Table 8-19 Meadowbank 2020 Non-Contact Water Diversion Ditch Water Quality Monitoring (ST-5)

ST-5	MAX GRAB	MAX MEAN	Unit	*Annual Average*								6/17/2020	7/6/2020	8/4/2020	9/8/2020	10/5/2020
Parameter				*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*					
Field Measured																
Temperature			°C	*-*	*-*	*16*	*12.4*	*12.8*	*7.3*	*7.5*	*12.0*	4.3	17.2	16.7	5.2	1.1
pH			-	*7.45*	*7.47*	*7.08*	*7.83*	*8.00*	*6.97*	*181.60*	*7.67*	7.43	7.60	8.29	7.99	7.71
Conductivity			uS/cm	*-*	*-*	*200.0*	*201.1*	*237.0*	*127.4*	*10.6*	*193.1*	44.5	123.7	177.8	191.8	222
Turbidity			NTU	*11.13*	*3.99*	*5.37*	*10.69*	*2.79*	*3.31*	*11.27*	*5.36*	12.60	1.48	1.19	1.46	0.61
Conventional Parameters																
Total Suspended Solids	30	**15**	mg/L	*6*	*3*	*4*	*3*	*2*	*3*	*8*	*6*	**17**	3	3	3	3
Major Ions																
Sulphate			mg/L	*49.2*	*168.2*	*55.5*	*49.1*	*40.1*	*27.5*	*19.4*	*23.6*	4.2	16.2	31.4	30.7	35.4
Cyanide			mg/L	*0.011*	*0.009*	*0.005*	*0.007*	*0.001*	*0.0046*	*0.0010*	*0.0028*	0.001	< 0.001	< 0.001	0.01	< 0.001
Total Metals																
Aluminum			mg/L	*0.160*	*0.100*	*0.128*	*0.069*	*0.037*	*0.059*	*0.234*	*0.1064*	0.460	0.020	0.016	0.015	0.021
Arsenic			mg/L	*0.0015*	*0.0015*	*0.0013*	*0.0010*	*0.0013*	*0.0005*	*0.0028*	*0.0018*	0.0056	< 0.0005	0.001	0.0012	0.0009
Copper			mg/L	*0.0143*	*0.0059*	*0.0056*	*0.0043*	*0.0021*	*0.0037*	*0.0079*	*0.0040*	0.0055	0.0025	0.0036	0.0043	0.004
Lead			mg/L	*0.0069*	*0.0003*	*0.0009*	*0.0010*	*0.0060*	*0.0030*	*0.0003*	*0.0003*	< 0.0003	< 0.0003	< 0.0003	< 0.00017	< 0.00017
Nickel			mg/L	*0.0180*	*0.0085*	*0.0038*	*0.0040*	*0.0047*	*0.0045*	*0.0047*	*0.0084*	0.0048	0.0044	0.0062	0.0164	0.0101
Zinc			mg/L	*0.006*	*0.003*	*0.001*	*0.001*	*0.001*	*0.001*	*0.008*	*0.004*	< 0.001	0.017	< 0.001	< 0.001	< 0.001
Radionuclides																
Radium-226			Bq/l	*0.016*	*0.004*	*0.002*	*0.002*	*0.002*	*0.004*	*0.003*	*0.004*	0.008	< 0.002	< 0.002	0.005	< 0.002

Grey highlighted cell refer to regulatory limits exceeded

Table 8-20 Meadowbank 2020 Non-Contact Water Diversion Ditch Water Quality Monitoring (ST-6)

ST-6	MAX GRAB	MAX MEAN	Sample date	Annual Average								6/17/2020	7/6/2020	8/4/2020	9/9/2020	10/5/2020
Parameter			Unit	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*					
Field Measured																
Temperature			°C	*-*	*-*	*19.8*	*14.3*	*11.25*	*7.33*	*11.95*	*7.50*	7.50	6.10	12.90	7.00	4.00
pH			pH units	*7.48*	*7.15*	*6.91*	*7.66*	*7.92*	*7.59*	*7.17*	*7.47*	7.17	7.01	7.75	7.87	7.55
Conductivity			uS/cm	*41.00*	*-*	*59.62*	*48.49*	*38.8*	*41.18*	*582.08*	*33.00*	50.50	20.29	32.10	33.60	28.50
Turbidity			NTU	*14.56*	*2.93*	*9.46*	*15.94*	*1.95*	*2.39*	*10.42*	*8.00*	36.10	0.89	1.50	1.09	0.44
Conventional Parameters																
TSS	30	15	mg/L	*3*	*4*	*11*	*2*	*1*	*1*	*13*	*7*	**26**	2	3	1	3
Major Ions																
Sulphate			mg/L	*6.9*	*7.1*	*5.4*	*5.7*	*6.1*	*5.6*	*29.9*	*5.5*	7.1	2.9	6.5	5.9	5.2
Cyanide			mg/L	*0.007*	*0.005*	*0.005*	*0.006*	*0.002*	*0.001*	*0.003*	*0.001*	0.002	< 0.001	< 0.001	< 0.001	< 0.001
Total Metals																
Aluminum			mg/L	*0.084*	*0.108*	*0.114*	*0.049*	*0.012*	*0.012*	*0.137*	*0.236*	1.158	< 0.006	< 0.006	0.007	< 0.005
Arsenic			mg/L	*0.0010*	*0.0005*	*0.0088*	*0.0006*	*0.0005*	*0.0005*	*0.0009*	*0.0009*	0.0026	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Copper			mg/L	*0.0043*	*0.0016*	*0.0023*	*0.0008*	*0.0005*	*0.0009*	*0.0024*	*0.0016*	0.0062	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Lead			mg/L	*0.0018*	*0.0003*	*0.0003*	*0.0061*	*0.0012*	*0.0005*	*0.0003*	*0.0002*	< 0.0003	< 0.0003	< 0.0003	< 0.00017	< 0.00017
Nickel			mg/L	*0.0010*	*0.0018*	*0.0025*	*0.0011*	*0.0006*	*0.0005*	*0.0030*	*0.0025*	0.0103	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc			mg/L	*0.002*	*0.004*	*0.001*	*0.002*	*0.001*	*0.001*	*0.002*	*0.004*	0.016	< 0.001	0.002	< 0.001	< 0.001
Radionuclides																
Radium-226			Bq/l	*0.002*	*0.002*	*0.002*	*0.002*	*0.002*	*0.002*	*0.004*	*0.002*	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

Grey highlighted cell refer to regulatory limits exceeded

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 nine years. In 2020, water was discharged from January 1 to June 5 and October 23 to December 31. A total of 89,496 m^3 of water collected from the seepage at the East dike was pumped to Second Portage Lake through the diffuser.

Agnico noticed TSS results trending up and therefore the discharge to Second Portage Lake was preventively stopped on June 5th. All water was diverted to the pits, as done in the past. Agnico continued to monitor TSS and restarted the discharge to Second Portage Lake on October 23rd.

Results from samples collected in 2020 at the final discharge point (ST-8) can be found in Table 8-21. Effluent water is analyzed as per NWB Water License Schedule I. The sampling location is illustrated on Figure 1. In 2020, there were no non-compliance observed with the Water License Part E Item 7 or with MDMER regulations. 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 8.5.3.1.3, East Dike Seepage was discharged into the receiving environment, Second Portage Lake (SPL)) from January 1 to June 5 and October 23 to December 31. As done in the past, when the discharge was stopped water was directed to the Portage Pit sumps. A total of 73,470 m^3 were transferred to the Portage Pit in 2020. 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 presented on Figure 1. Results are presented in Table 8-22. There are no applicable license limits.

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

As of November 19th, 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 2020. The location of sampling station ST-9 is illustrated on Figure 1.

Channel crossing inspections were not undertaken in 2020 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 2020. There is currently no plans to have a discharge in 2021. The location of sampling station is illustrated on Figure 3.

Table 8-21 Meadowbank 2020 East Dike Discharge Water Quality Monitoring (ST-8)

ST-8	MAX GRAB	MAX MONTHLY MEAN	Sample date	*Annual Average*							1/6/2020	2/10/2020	3/2/2020	4/6/2020	5/4/2020	10/26/2020	11/2/2020	12/7/2020
Parameter			Unit	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*								
Field Measured																		
Temperature			°C	-	-	-	-	-	-	*4.71*	5.1	6.3	1.6	7.9	2	7.2	3.5	4.1
pH			pH units	*7.29*	*7.37*	*7.65*	*7.82*	*7.66*	*7.53*	*7.82*	7.6	8.06	7.97	7.51	8.07	7.84	7.50	8.01
Conductivity			uS/cm	-	-	-	-	-	-	*79.93*	73.20	86.40	86.80	99.60	104.70	64.00	63.30	61.40
Turbidity			NTU	*1.92*	*4.88*	*3.48*	*6.11*	*6.01*	*2.13*	*2.24*	1.10	4.39	1.99	3.85	2.99	0.56	1.18	1.87
Conventional Parameters																		
TSS	30	15	mg/L	*8*	*7*	*4*	*10*	*1*	*3*	*2*	2	1	3	4	1	4	2	2
Major Ions																		
Sulphate			mg/L	*6.9*	*21.6*	*8.0*	*9.2*	*7.5*	*8.9*	*11.3*	31.6	8.7	6.2	16	8.5	6.6	6.5	5.9
Cyanide			mg/L	*0.013*	*0.005*	*0.005*	*0.002*	*0.001*	*0.002*	*0.001*	0.003	0.003	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.0050
Total Metals																		
Aluminum			mg/L	*0.068*	*0.040*	*0.047*	*0.043*	*0.046*	*0.032*	*0.031*	0.039	0.031	0.017	0.067	0.020	< 0.005	0.036	0.037
Arsenic			mg/L	*0.0011*	*0.0038*	*0.0007*	*0.0011*	*0.0005*	*0.0010*	*0.0040*	0.0021	< 0.0005	0.0005	0.0257	0.0006	0.0009	0.0010	0.0010
Copper			mg/L	*0.0013*	*0.0016*	*0.0017*	*0.0012*	*0.0005*	*0.0013*	*0.0016*	0.0022	0.0010	0.0016	0.0019	0.0034	0.0006	0.0006	0.0016
Lead			mg/L	*0.0011*	*0.0014*	*0.0003*	*0.0008*	*0.0003*	*0.0003*	*0.0007*	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.00017	0.0006	0.0003
Nickel			mg/L	*0.0011*	*0.0016*	*0.0011*	*0.0007*	*0.0005*	*0.0006*	*0.0018*	0.0009	< 0.0005	< 0.0005	0.0044	< 0.0005	< 0.0005	< 0.0005	< 0.0010
Zinc			mg/L	*0.003*	*0.005*	*0.004*	*0.003*	*0.001*	*0.003*	*0.004*	0.004	0.002	< 0.001	0.002	0.003	< 0.001	< 0.001	0.005
Radionuclides																		
Radium-226			Bq/l	*0.003*	*0.002*	*0.002*	*0.002*	*0.003*	*0.002*	*0.006*	< 0.002	0.007	0.008	0.01	0.01	< 0.002	< 0.002	< 0.005

Table 8-22 Meadowbank 2020 East Dike Seepage Water Quality Monitoring (ST-S-1)

ST-S-1	Sample date	*Annual Average*						7/7/2020	8/3/2020	9/7/2020	10/5/2020
Parameter	Unit	*2013*	*2014*	*2015*	*2018*	*2019*	*2020*				
Field Measured											
pH	pH units	*7.73*	*7.45*	*7.07*	*7.54*	*7.825*	*8.11*	8.18	7.99	8.17	8.09
Turbidity	NTU	*6.26*	*4.35*	*2.51*	*5.22*	*28.79*	*1.73*	2.87	1.47	1.02	1.57
Conventional Parameters											
Hardness	mg CaCO3/L	*30*	*24*	*40*	*32*	*39*	*60*	59	55	81	43
Total alkalinity, as CaCO3	mg CaCO3/L	*50*	*37*	*30*	*31*	*43*	*44*	32	46	55	43
TSS	mg/L	*-*	*-*	*1*	*6*	*47*	*2*	3	1	3	1
TDS	mg/L	*-*	*-*	*-*	*58*	*60*	*77*	83	77	94	52
Major Ions											
Chloride	mg/L	*0.8*	*0.7*	*0.9*	*1.1*	*1.8*	*2.9*	8.1	1.1	1.2	1
Fluoride	mg/L	*0.09*	*0.09*	*0.08*	*0.11*	*0.11*	*0.11*	0.09	0.11	0.13	0.11
Sulphate	mg/L	*4.7*	*6.0*	*18.1*	*11.9*	*14.9*	*22.1*	27.4	20.6	31.8	8.7
Cyanide	mg/L	*-*	*-*	*-*	*0.001*	*0.001*	*0.003*	0.006	0.001	0.002	0.001
Nutrients and Chlorophyll a											
Total ammonia as NH4	mg N/L	*0.05*	*0.01*	*0.01*	*0.03*	*0.02*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Un-Ionized Ammonia, calculated	mg NH3/L	*0.06*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg N/L	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.43*	0.48	0.63	0.47	0.14
Nitrite	mg N/L	*0.18*	*0.22*	*0.47*	*0.01*	*0.32*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Total Metals											
Aluminum	mg/L	*0.240*	*0.098*	*0.041*	*0.044*	*0.405*	*0.030*	0.018	0.038	0.043	0.019
Arsenic	mg/L	*0.0037*	*0.0018*	*0.0005*	*0.0044*	*0.0026*	*0.0032*	0.0059	0.0024	0.0027	0.0019
Barium	mg/L	*0.0092*	*0.0083*	*0.0083*	*0.0074*	*0.0112*	*0.0103*	0.0084	0.0108	0.0138	0.008
Cadmium	mg/L	*0.00002*	*0.00004*	*0.00002*	*0.00002*	*0.00005*	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.0010*	*0.0007*	*0.0011*	*0.0008*	*0.0050*	*0.0006*	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.0037*	*0.0012*	*0.0007*	*0.0009*	*0.0020*	*0.0023*	0.0006	0.0065	0.0014	0.0006
Iron	mg/L	*0.42*	*0.15*	*0.10*	*0.11*	*0.79*	*0.06*	0.08	0.05	0.08	0.02
Lead	mg/L	*0.0022*	*0.0012*	*0.0003*	*0.0003*	*0.0003*	*0.0002*	< 0.0003	< 0.0003	< 0.00017	< 0.00017
Manganese	mg/L	*0.0100*	*0.0059*	*0.0140*	*0.0036*	*0.0166*	*0.0240*	0.0444	0.0071	0.0296	0.0148
Mercury	mg/L	*0.00001*	*0.00003*	*0.00001*	*0.00001*	*0.00002*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0005*	*0.0011*	*0.0006*	*0.0005*	*0.0009*	*0.0015*	< 0.0005	0.0007	0.0029	0.0020
Nickel	mg/L	*0.0029*	*0.0012*	*0.0029*	*0.0015*	*0.0039*	*0.0046*	0.0127	0.0021	0.003	< 0.0005
Selenium	mg/L	*0.001*	*0.001*	*0.001*	*0.002*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.0005
Silver	mg/L	*0.0002*	*0.0001*	*0.0001*	*0.0001*	*0.0002*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0310*	*0.0050*	*0.0050*	*0.0004*	*0.0005*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.098*	*0.003*	*0.001*	*0.001*	*0.008*	*0.001*	< 0.001	0.002	< 0.001	< 0.001

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 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.

In 2020, 327,667 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 8-23. Water volumes pumped in 2020 at ST-16 was 75,082 m^3, which was higher compared to the pumped volume of previous years 2014-2019 (Table 8-23). 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 be effective in controlling and minimizing seepage from the North Cell.

Table 8-23 Meadowbank Waste Rock Seepage pumped volume 2014-2020

Year	Volume pumped (m^3)
2014	32,169
2015	19,236
2016	20,844
2017	25,815
2018	12,606
2019	33,782
2020	75,082

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 (NH3) and Ammonia Nitrogen results are all below CCME, Water Licence and MDMER criteria in NP2 Lake from 2014 – 2018. 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). Refer to the 2018 Annual Report for the results.

The KivIA requested that Agnico continue monitoring until there is a 5 year period of non-detect cyanide results. In 2018 (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 results, Agnico Eagle has suspended the current program in 2019. However, ECCC's comment regarding the 2018 Annual Report recommended that Agnico continue to monitor Lake NP-2 on a yearly basis for the same suite of parameters as have been measured since 2014. Water quality results for 2020 ST-16 and NP-2 South can be found in Table 8-24 and 8-25, respectively. Monitoring stations are illustrated on Figure 1. Results are presented for information purposes only as there are no applicable water license limits at this location.

In accordance with the 2020 Freshet Action Plan (see Appendix D of the 2020 Water Management Report and Plan Version 9 (Appendix 11), Agnico will continue in 2021 to contain the ST-16 Seepage and to monitor the water quality, as needed. This is conducted to assess and prevent any impact to the receiving environment (NP2) and to downstream lakes (NP-1, Dogleg and Second Portage).

Table 8-24 Meadowbank 2020 RSF Seepage Water Quality Monitoring (ST-16)

ST-16	Sample date	*Annual Average*								6/8/2020	7/13/2020	8/10/2020	9/14/2020
Parameter	**Unit**	***2013***	***2014***	***2015***	***2016***	***2017***	***2018***	***2019***	***2020***				
Field Measured													
Temperature	°C	-	5.6	10.6	11.0	14.1	9.2	13.1	9.1	6.7	12.9	12.8	4
pH	pH units	6.95	7.34	7.39	7.46	7.48	7.54	7.75	7.70	7.57	7.79	7.89	7.55
Conductivity	uS/cm	2138	2432	473	445	435	401	406	289	84.7	279	348	444
Turbidity	NTU	70.00	22.44	11.75	3.76	2.74	4.15	2.90	22.53	81.5	2.70	2.35	3.58
Conventional Parameters													
Hardness	mg CaCO3/L	933	1131	143	189	154	176	167	140	43	113	165	240
Total alkalinity, as CaCO3	mg CaCO3/L	142	171	62	74	77	75	61	75	22	67	103	109
TSS	mg/L	50	19	10	9	4	1	265	10	35	2	1	2
TDS	mg/L	1599	2525	318	336	315	248	2	187	68	156	229	294
Total organic carbon	mg/L	-	36	11	8	9	7	4	4	2.3	-	5	5
Dissolved organic carbon	mg/L	-	41	10	6	9	6	5	3	2.6	-	< 0.2	5.1
Carbonate	mg/L	-	-	-	2	2	2	2	4.00	< 2	-	< 5	< 5
Bicarbonate	mg/L	-	-	-	74	77	72	61	78	22	-	103	109
Major Ions													
Bromide	mg/L	-	-	-	-	-	-	-	0.07	0.05	-	0.06	0.1
Chloride	mg/L	223.8	500.6	10.3	8.9	9.6	5.2	5.2	3.0	1.4	1.7	3.3	5.4
Fluoride	mg/L	0.20	0.33	0.19	0.20	0.23	0.19	0.20	0.17	0.04	0.17	0.25	0.21
Reactive Silica	mg/L	-	2.3	-	3.88	2.98	2.98	2.57	5.01	6.88	-	3.47	4.68
Sulphate	mg/L	1418.7	2020.0	130.1	136.3	92.5	106.0	102.2	67.1	27.4	51.1	73	117
Thiocyanate	mg/L	-	3.91	0.23	0.17	0.10	0.05	0.05	0.05	< 0.05	-	< 0.05	< 0.05
Thiosulfate	mg/L	-	7.59	1.34	0.02	0.02	0.05	0.02	0.02	< 0.02	-	0.02	< 0.02
Cyanide (free)	mg/L	-	0.480	0.005	0.005	0.005	0.005	0.002	0.001	< 0.001	-	0.001	0.001
Cyanide (WAD)	mg/L	-	0.140	0.010	0.003	0.053	0.001	0.001	0.001	< 0.001	-	< 0.001	< 0.001
Cyanide	mg/L	-	1.380	0.022	0.003	0.074	0.002	0.002	0.001	< 0.001	0.001	0.002	< 0.001
Nutrients and Chlorophyll a													
Total ammonia as NH4	mg N/L	14.08	31.34	1.11	0.28	0.32	0.08	0.07	0.06	0.07	< 0.05	0.04	0.07
Un-Ionized Ammonia, calculated	mg NH3/L	0.48	1.25	0.02	0.01	0.04	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg N/L	23.20	24.35	7.84	6.66	6.30	4.20	5.44	2.50	0.59	2.29	2.34	4.78
Nitrite	mg N/L	0.24	0.96	0.07	0.04	0.07	0.04	0.04	0.04	0.09	0.03	0.01	0.01
Total nitrogen	mg N/L	-	45.00	2.28	1.12	1.32	0.82	0.62	0.39	0.39	-	0.61	0.18
Total phosphorus	mg/L	-	0.12	0.05	0.02	0.03	0.01	0.02	0.01	0.02	-	< 0.01	< 0.01
Total orthophosphate	mg/L	0.07	-	0.02	0.02	0.01	0.01	0.01	0.01	0.02	-	0.01	< 0.01
Chlorophyll a	mg/L	-	1.56	0.86	0.41	0.28	0.31	0.55	0.09	0.0012	-	< 0.13	< 0.13
Total Metals													

ST-16	Sample date	Annual Average								6/8/2020	7/13/2020	8/10/2020	9/14/2020
Parameter	**Unit**	***2013***	***2014***	***2015***	***2016***	***2017***	***2018***	***2019***	***2020***				
Aluminum	mg/L	*0.184*	*0.160*	*0.006*	*0.099*	*0.038*	*0.030*	*2.307*	*0.642*	2.479	0.026	0.049	0.012
Antimony	mg/L	*0.0008*	*0.0006*	*0.0001*	*0.0003*	*0.0002*	*0.0003*	*0.0003*	*0.0001*	< 0.0001	-	< 0.0001	< 0.0001
Arsenic	mg/L	*0.0086*	*0.0072*	*0.0005*	*0.0030*	*0.0006*	*0.0024*	*0.0186*	*0.0140*	0.0065	0.0268	0.0143	0.0084
Barium	mg/L	*0.1212*	*0.0320*	*0.0172*	*0.0181*	*0.0163*	*0.0190*	*0.0191*	*0.0147*	0.0255	0.0119	< 0.0005	0.0207
Beryllium	mg/L	*0.0004*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	< 0.0005	-	< 0.0005	< 0.0005
Boron	mg/L	*0.10*	*0.08*	*0.04*	*0.02*	*0.01*	*0.02*	*0.01*	*0.01*	< 0.01	-	< 0.01	< 0.01
Cadmium	mg/L	*0.00033*	*0.00026*	*0.00005*	*0.00004*	*0.00002*	*0.00003*	*0.00002*	*0.00002*	< 0.0000200	< 0.00002	< 0.0000200	< 0.00002
Calcium	mg/L	*312.0*	*15.7*	*-*	*53.3*	*34.2*	*36.8*	*32.1*	*32.4*	9.89	25.8	38.2	55.6
Chromium	mg/L	*0.0018*	*0.0029*	*0.0006*	*0.0006*	*0.0006*	*0.0011*	*0.0011*	*0.0081*	0.0302	0.0008	< 0.0006	< 0.0006
Cobalt	mg/L	*0.2044*	*0.2657*	*0.0047*	*0.0029*	*0.0013*	*0.0009*	*0.0011*	*0.0014*	0.0029	-	< 0.0005	0.0008
Copper	mg/L	*1.925*	*0.390*	*0.030*	*0.026*	*0.018*	*0.016*	*0.011*	*0.010*	0.007	0.0093	0.0127	0.0123
Iron	mg/L	*9.3*	*1.2*	*0.3*	*0.1*	*0.315*	*0.4*	*0.2*	*1.0*	3.2	0.24	0.33	0.3
Lead	mg/L	*0.0008*	*0.0022*	*0.0003*	*0.0003*	*0.0016*	*0.0003*	*0.0003*	*0.0007*	0.0020	< 0.0003	< 0.00017	< 0.00017
Lithium	mg/L	*0.008*	*0.005*	*0.005*	*0.005*	*0.018*	*0.005*	*0.005*	*0.005*	< 0.005	-	< 0.005	< 0.005
Magnesium	mg/L	*60.00*	*15.67*	*11.49*	*18.93*	*17.05*	*17.00*	*18.13*	*14.48*	4.39	11.80	16.96	24.76
Manganese	mg/L	*4.0825*	*1.5100*	*0.7082*	*0.3835*	*0.1315*	*11.3582*	*0.0371*	*0.0620*	0.0895	0.0225	0.0355	0.1005
Mercury	mg/L	*0.00010*	*0.00002*	*0.00001*	*0.00023*	*0.00001*	*0.00001*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0930*	*0.0670*	*0.0152*	*0.0123*	*0.0106*	*0.0109*	*0.0181*	*0.0136*	0.0013	0.0175	0.0249	0.0106
Nickel	mg/L	*0.9667*	*0.5400*	*0.0430*	*0.0369*	*0.0203*	*0.0158*	*0.0102*	*0.0143*	0.0194	0.0085	0.0112	0.0179
Potassium	mg/L	*88.00*	*41.75*	*8.33*	*9.32*	*8.35*	*6.18*	*8.12*	*6.70*	2.33	-	7.58	10.18
Selenium	mg/L	*0.013*	*0.028*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	*0.0056*	*0.0013*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium	mg/L	*590.00*	*4.50*	*-*	*22.05*	*14.76*	*11.56*	*11.63*	*8.25*	2.13	-	8.11	14.5
Strontium	mg/L	*1.327*	*0.400*	*0.156*	*0.167*	*0.157*	*0.203*	*0.190*	*0.140*	0.041	-	0.165	0.214
Tellurium	mg/L	*-*	*0.0005*	*-*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	< 0.0005	-	< 0.0005	< 0.0005
Thallium	mg/L	*0.0034*	*0.0050*	*0.0050*	*0.0008*	*0.0008*	*0.0002*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	*0.001*	*0.001*	*0.001*	*0.003*	*0.001*	*0.001*	*0.001*	*0.001*	< 0.001	-	< 0.001	< 0.001
Titanium	mg/L	*0.23*	*0.18*	*0.03*	*0.03*	*0.04*	*0.04*	*0.01*	*0.03*	0.06	-	< 0.01	< 0.01
Uranium	mg/L	*0.106*	*0.069*	*0.006*	*0.006*	*0.005*	*0.004*	*0.006*	*0.004*	0.002	-	0.004	0.006
Vanadium	mg/L	*0.0007*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0019*	0.0048	-	< 0.0005	< 0.0005
Zinc	mg/L	*0.006*	*0.005*	*0.001*	*0.002*	*0.001*	*0.001*	*0.001*	*0.003*	0.008	< 0.001	< 0.001	0.001
Dissolved Metals													
Aluminum	mg/L	*0.006*	*0.001*	*0.005*	*0.002*	*0.001*	*0.001*	*0.003*	*0.006*	< 0.006	-	< 0.006	< 0.006
Antimony	mg/L	*0.0165*	*0.0175*	*0.4743*	*0.0060*	*0.0060*	*0.0060*	*0.0005*	*0.0001*	< 0.0001	-	< 0.0001	< 0.0001
Arsenic	mg/L	*-*	*0.0006*	*0.0003*	*0.0002*	*0.0002*	*0.0001*	*0.0004*	*0.0048*	0.0010	-	0.0099	0.0035
Barium	mg/L	*0.0045*	*0.0052*	*0.0005*	*0.0018*	*0.0008*	*0.0008*	*0.0161*	*0.0064*	0.0033	-	< 0.0005	0.0153
Beryllium	mg/L	*0.0996*	*0.0530*	*0.0242*	*0.0177*	*0.0154*	*0.0176*	*0.0168*	*0.0005*	< 0.0005	-	< 0.0005	< 0.0005

ST-16	Sample date	Annual Average								6/8/2020	7/13/2020	8/10/2020	9/14/2020
Parameter	**Unit**	***2013***	***2014***	***2015***	***2016***	***2017***	***2018***	***2019***	***2020***				
Boron	mg/L	*-*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.010*	< 0.01	-	< 0.01	< 0.01
Cadmium	mg/L	*-*	*0.08250*	*0.05500*	*0.01050*	*0.01000*	*0.02000*	*0.01000*	*0.00002*	< 0.00002	-	< 0.00002	< 0.00002
Chromium	mg/L	*0.0004*	*0.0006*	*0.0002*	*0.00003*	*0.00002*	*0.00003*	*0.00002*	*0.0006*	< 0.0006	-	< 0.0006	< 0.0006
Cobalt	mg/L	*-*	*0.0029*	*0.0033*	*0.0006*	*0.0006*	*0.0009*	*0.0006*	*0.0005*	< 0.0005	-	< 0.0005	< 0.0005
Copper	mg/L	*-*	*0.0770*	*0.0062*	*0.0025*	*0.0012*	*0.0007*	*0.0010*	*0.0060*	0.0009	-	0.0086	0.0084
Iron	mg/L	*1.81*	*1.40*	*0.05*	*0.02*	*0.01*	*0.01*	*0.01*	*0.03*	0.01	-	0.04	0.05
Lead	mg/L	*0.1150*	*0.5600*	*1.4500*	*0.2125*	*0.1450*	*0.0967*	*0.0267*	*0.0002*	< 0.0003	-	< 0.00017	< 0.00017
Lithium	mg/L	*0.0003*	*0.001*	*0.004*	*0.0003*	*0.0003*	*0.0003*	*0.002*	*0.005*	< 0.005	-	< 0.005	< 0.005
Manganese	mg/L	*-*	*0.0050*	*0.0050*	*0.0050*	*0.0050*	*0.0050*	*0.0050*	*0.0500*	0.0477	-	0.0255	0.0768
Mercury	mg/L	*4.08250*	*2.62000*	*0.72660*	*0.35940*	*0.11400*	*9.89157*	*0.02627*	*0.00001*	< 0.00001	-	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0001*	*0.0001*	*0.00001*	*0.00001*	*0.00001*	*0.00001*	*0.00001*	*0.0099*	0.0014	-	0.0208	0.0076
Nickel	mg/L	*0.0980*	*0.0990*	*0.0146*	*0.0125*	*0.0098*	*0.0103*	*0.0169*	*0.0092*	0.0019	-	0.0105	0.0151
Selenium	mg/L	*1.113*	*0.430*	*0.051*	*0.035*	*0.018*	*0.014*	*0.008*	*0.001*	< 0.001	-	< 0.001	< 0.001
Silver	mg/L	*0.0140*	*0.0480*	*0.0013*	*0.0001*	*0.0010*	*0.0012*	*0.0006*	*0.0001*	< 0.0001	-	< 0.0001	< 0.0001
Strontium	mg/L	*0.0002*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.122*	0.040	-	0.142	0.184
Tellurium	mg/L	*-*	*0.3965*	*0.1628*	*0.1545*	*0.1548*	*0.1715*	*0.1767*	*0.0005*	< 0.0005	-	< 0.0005	< 0.0005
Thallium	mg/L	*-*	*0.0050*	*-*	*0.0050*	*0.0050*	*-*	*0.0005*	*0.0002*	< 0.0002	-	< 0.0002	< 0.0002
Tin	mg/L	*0.003*	*0.005*	*0.005*	*0.001*	*0.001*	*0.0002*	*0.0002*	*0.001*	< 0.001	-	< 0.001	< 0.001
Titanium	mg/L	*-*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.010*	< 0.01	-	< 0.01	< 0.01
Uranium	mg/L	*-*	*0.183*	*0.038*	*0.020*	*0.030*	*0.030*	*0.010*	*0.003*	< 0.001	-	0.004	0.005
Vanadium	mg/L	*-*	*0.0685*	*0.0065*	*0.0055*	*0.0043*	*0.0045*	*0.0050*	*0.0005*	< 0.0005	-	< 0.0005	< 0.0005
Zinc	mg/L	*-*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	< 0.001	-	< 0.001	< 0.001

Table 8-25 Meadowbank 2020 NP2-South Water Quality Monitoring

NP2-South	Sample date	Annual Average							7/13/2020	8/10/2020	9/14/2020
Parameter	**Unit**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**			
Field Measured											
Temperature	°C	6.3	19.1	10.9	11.7	9.7	11.0	10.3	12.3	14.6	3.9
pH	pH units	7.30	7.13	7.28	7.79	7.72	7.46	7.85	7.69	8.15	7.72
Conductivity	uS/cm	317.6	284.5	236.0	231.4	205.5	195.4	173.2	133.9	186.4	199.2
Turbidity	NTU	2.70	3.20	1.40	1.40	1.81	1.70	1.47	1.50	0.77	2.15
Conventional Parameters											
Hardness	mg CaCO3/L	99	75	82	74	69	71	90	72	89	110
Total alkalinity, as CaCO3	mg CaCO3/L	40	42	47	56	50	37	63	43	68	77
TSS	mg/L	2	1	3	3	2	1	2	2	3	2
TDS	mg/L	270	183	163	147	108	118	113	82	122	136
Total organic carbon	mg/L	5.7	4.2	4.5	5.9	4.9	3.7	4.1	2.8	4.9	4.5
Dissolved organic carbon	mg/L	5.2	4.4	3.8	5.9	3.8	3.7	3.9	2.6	4.3	4.9
Carbonate	mg/L	-	-	2	2	2	2	5	< 5	< 5	< 5
Bicarbonate	mg/L	-	-	47	56	50	37	63	43	68	77
Major Ions											
Chloride	mg/L	9.6	6.8	5.1	4.6	3.6	3.1	2.2	1.4	2.4	2.8
Fluoride	mg/L	0.1	0.1	0.003	0.1	0.1	0.1	0.1	0.08	0.13	0.14
Reactive Silica	mg/L	-	-	0.35	0.51	0.41	1.00	0.81	0.95	0.63	0.85
Sulphate	mg/L	121.3	79.8	58.9	44.4	39.2	31.7	32.6	24.4	33.2	40.1
Thiocyanate	mg/L	0.05	0.05	0.13	0.11	0.05	0.05	0.05	0.05	0.05	0.05
Cyanide (free)	mg/L	0.009	0.005	0.005	0.005	0.005	0.001	0.001	< 0.001	< 0.001	0.002
Cyanide (WAD)	mg/L	0.013	0.005	0.003	0.002	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001
Cyanide	mg/L	0.021	0.005	5.130	0.002	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001
Nutrients and Chlorophyll a											
Total ammonia as NH4	mg N/L	2.90	0.01	0.03	0.05	0.03	0.01	0.02	< 0.01	0.02	0.02
Un-Ionized Ammonia, calculated	mg NH3/L	0.02	0.01	0.01	0.04	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg N/L	2.47	1.26	0.28	0.09	0.01	0.14	0.08	0.05	0.03	0.16
Nitrite	mg N/L	0.19	0.01	0.01	0.01	0.18	0.01	0.03	0.02	< 0.01	0.05
Total nitrogen	mg N/L	2.70	0.36	0.49	0.62	0.24	0.23	0.19	0.23	0.19	0.14
Total phosphorus	mg/L	0.01	0.01	0.01	2.23	0.01	0.01	0.02	< 0.04	< 0.01	< 0.01
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	< 0.01	< 0.01
Total Metals											
Aluminum	mg/L	0.067	0.006	0.006	0.067	0.006	0.043	0.015	0.011	< 0.006	0.028
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.0008	0.0034	0.0005	0.0005	0.0006	0.0008	0.0010	0.0013	0.0007	0.0011
Barium	mg/L	0.0150	0.0100	0.0069	0.0050	0.0045	0.0042	0.0038	0.0054	< 0.0005	0.0056
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002
Calcium	mg/L	-	-	22.2	19.1	17.6	18.4	23.4	18.7	23.2	28.4
Chromium	mg/L	0.0006	0.0006	0.0009	0.0006	0.0007	0.0006	0.0006	< 0.0006	< 0.0006	< 0.0006
Cobalt	mg/L	0.0034	0.0010	0.0005	0.0006	0.0005	0.0005	0.0009	0.0006	< 0.0005	0.0015
Copper	mg/L	0.009	0.005	0.005	0.004	0.003	0.004	0.004	0.004	0.004	0.0046
Iron	mg/L	0.30	0.06	0.08	0.13	0.09	0.06	0.15	0.19	0.14	0.13
Lead	mg/L	0.0008	0.0003	0.0003	0.0008	0.0008	0.0003	0.0002	< 0.0003	< 0.00017	< 0.00017
Lithium	mg/L	0.005	0.012	0.005	0.005	0.005	0.005	0.005	< 0.005	< 0.005	< 0.005
Magnesium	mg/L	8.23	6.49	6.90	6.57	6.10	6.16	7.72	6.16	7.58	9.43
Manganese	mg/L	0.0320	0.0100	0.0160	0.0150	0.0108	0.0062	0.0357	0.0266	0.0309	0.0497
Mercury	mg/L	0.00001	0.00001	0.00001	0.00002	0.00001	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0005	0.0005	0.0006	0.0006	0.0005	0.0006	0.0007	< 0.0005	< 0.0005	0.0012
Nickel	mg/L	0.0130	0.0052	0.0083	0.0053	0.0055	0.0111	0.0155	0.0245	0.0108	0.0374
Potassium	mg/L	5.17	2.82	3.66	2.33	1.92	1.94	2.35	2.04	2.29	2.73
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001

NP2-South	Sample date	Annual Average							7/13/2020	8/10/2020	9/14/2020
Parameter	**Unit**	***2014***	***2015***	***2016***	***2017***	***2018***	***2019***	***2020***			
Silver	mg/L	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001
Sodium	mg/L	*-*	*-*	*11.70*	*9.76*	*7.05*	*5.17*	*4.92*	3.79	5.03	5.93
Strontium	mg/L	*0.110*	*0.099*	*0.071*	*0.083*	*0.068*	*0.074*	*0.077*	0.064	0.079	0.089
Tellurium	mg/L	*-*	*-*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	< 0.0005	< 0.0005	< 0.0005
Thallium	mg/L	*0.0050*	*0.0050*	*0.0008*	*0.0008*	*0.0002*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	*0.020*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001
Titanium	mg/L	*0.02*	*0.01*	*0.01*	*0.02*	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01
Uranium	mg/L	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	< 0.001	0.001	0.002
Vanadium	mg/L	*0.0005*	*0.0005*	*0.0009*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	*0.001*	*0.001*	*0.001*	*0.003*	*0.001*	*0.001*	*0.004*	< 0.001	< 0.001	0.009
Dissolved Metals											
Aluminum	mg/L	*0.013*	*0.006*	*0.006*	*0.006*	*0.005*	*0.003*	*0.009*	< 0.006	< 0.006	0.014
Antimony	mg/L	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	*0.0007*	*0.0018*	*0.0005*	*0.0005*	*0.0006*	*0.0007*	*0.0005*	< 0.0005	0.0006	0.0005
Barium	mg/L	*0.0150*	*0.0086*	*0.0061*	*0.0044*	*0.0047*	*0.0055*	*0.0028*	0.0031	< 0.0005	0.0048
Beryllium	mg/L	*0.0005*	*0.0006*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	*0.02*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	*0.00013*	*0.00003*	*0.00002*	*0.00002*	*0.00003*	*0.00002*	*0.00002*	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.0006*	*0.0015*	*0.0009*	*0.0008*	*0.0007*	*0.0006*	*0.0006*	< 0.0006	< 0.0006	< 0.0006
Cobalt	mg/L	*0.0036*	*0.0010*	*0.0005*	*0.0006*	*0.0005*	*0.0005*	*0.0007*	< 0.0005	< 0.0005	0.001
Copper	mg/L	*0.0069*	*0.0040*	*0.0036*	*0.0027*	*0.0028*	*0.0027*	*0.0019*	0.0014	0.002	0.0024
Iron	mg/L	*0.02*	*0.01*	*0.01*	*0.03*	*0.02*	*0.01*	*0.01*	< 0.01	0.01	0.02
Lead	mg/L	*0.0038*	*0.0003*	*0.0003*	*0.0005*	*0.0004*	*0.0003*	*0.0002*	< 0.0003	< 0.00017	< 0.00017
Lithium	mg/L	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	< 0.005	< 0.005	< 0.005
Manganese	mg/L	*0.0400*	*0.0005*	*0.0017*	*0.0046*	*0.0057*	*0.0016*	*0.0233*	0.0171	0.016	0.0367
Mercury	mg/L	*0.00001*	*0.00001*	*0.00001*	*0.00001*	*0.00001*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0015*	*0.0006*	*0.0006*	*0.0005*	*0.0005*	*0.0006*	*0.0006*	< 0.0005	< 0.0005	0.0007
Nickel	mg/L	*0.0130*	*0.0046*	*0.0067*	*0.0043*	*0.0051*	*0.0089*	*0.0185*	0.0185	0.0083	0.0288
Selenium	mg/L	*0.002*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001
Silver	mg/L	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001
Strontium	mg/L	*0.11*	*0.09*	*0.07*	*0.07*	*0.07*	*0.06*	*0.06*	0.05	0.064	0.067
Thallium	mg/L	*0.0050*	*0.0050*	*0.0008*	*0.0008*	*0.0002*	*0.0003*	*0.0002*	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	*0.003*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001
Titanium	mg/L	*0.02*	*0.01*	*0.01*	*0.02*	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01
Uranium	mg/L	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	0.001
Vanadium	mg/L	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001

8.5.3.1.8 North Portage Pit Sump/Lake (ST-17)

In 2019, there was no more sump associated with the North Portage Pit and thus, as per the Water License, Agnico has started to consider this area as the Portage Pit Lake. In 2020 the new naming convention of ST-17 replaced ST-17 Lake once tailings deposition started. Two (2) samples were collected from North Portage Pit Lake (ST-17 Lake) in June and July prior to the start of in-pit tailings deposition which began on August 19th, 2020 in Portage Pit E. Four (4) samples were collected with the new naming convention (ST-17) in August, September, and October during open water after the start of in-pit deposition. Pore Water Quality Monitoring Program is followed. Moving forward, ST-17 will be used. The sampling location is illustrated on Figure 1. Results are presented in Table 8-26 and compare the average to the sump results from previous years 2015-2018. There are no applicable license limits.

8.5.3.1.9 South Portage Pit Sump/Lake (ST-19)

In 2020, water from South Portage Pit Lake was sampled in August, September and October. All sample were conducted during open water as per the requirements in the NWB Water License (sampling station ST-19 Lake on Figure 1). Moving forward ST-19 will be used instead of ST-19 Lake. Results are presented in Table 8-27. There are no applicable license limits.

Table 8-26 Meadowbank 2020 North Portage Pit Lake Water Quality Monitoring (ST-17/ST-17 Lake)

ST-17/ST-17 Lake	Sample date	Annual average						6/21/2020	7/8/2020	8/12/2020	9/10/2020	10/7/2020	10/18/2020
Parameter	**Unit**	*2015 **	*2016 **	*2017 **	*2018 **	*2019 ***	*2020*	***	***				
Field Measured													
pH	pH units	*7.87*	*7.91*	*7.85*	*-*	*7.84*	*7.24*	-	7.97	8.17	4.90	7.90	-
Turbidity	NTU	*4.3*	*46.3*	*9.4*	*-*	*4.2*	*14.2*	-	4.3	3.8	5.4	43.5	-
Conventional Parameters													
Hardness	mg CaCO3/L	*239*	*306*	*214*	*166*	*631*	*610*	607	610	894	644	845	57
Total alkalinity, as CaCO3	mg CaCO3/L	*77*	*97*	*98*	*61*	*70*	*91*	62	66	99	126	132	62
Total acidity	mg/L	*-*	*-*	*-*	*-*	*-*	*5*	< 2	< 5	-	-	9	-
TSS	mg/L	*4*	*53*	*58*	*22*	*8*	*63*	124	2	13	6	217	15
TDS	mg/L	*399*	*518*	*463*	*303*	*1391*	*1120*	1085	1115	1519	1408	1585	5
Dissolved organic carbon	mg/L	*-*	*-*	*-*	*-*	*15.2*	*12.5*	14.0	13.0	23.5	13.1	7.5	3.6
Major Ions													
Chloride	mg/L	*17.2*	*23.7*	*25.0*	*16.5*	*161.5*	*124.5*	130.8	132.9	152.2	142.4	175.4	13
Fluoride	mg/L	*0.31*	*0.43*	*0.42*	*0.25*	*0.38*	*0.25*	0.24	0.15	0.33	0.32	0.37	0.09
Sulphate	mg/L	*179*	*232*	*186*	*130*	*916*	*720*	647	573	1010	941	1140	9
Cyanide (free)	mg/L	*0.010*	*0.007*	*0.016*	*-*	*0.014*	*0.027*	0.093	0.018	0.038	0.004	0.004	0.002
Cyanide	mg/L	*0.007*	*0.019*	*0.046*	*0.007*	*0.035*	*0.067*	0.248	0.053	0.07	0.014	0.017	< 0.001
Nutrients and Chlorophyll a													
Total ammonia as NH4	mg N/L	*2.90*	*3.72*	*2.60*	*1.82*	*6.74*	*13.09*	13.02	12.92	17.93	15.37	19.26	0.04
Un-Ionized Ammonia, calculated	mg NH3/L	*0.06*	*0.09*	*0.08*	*0.03*	*0.11*	*0.31*	0.33	0.27	0.51	0.26	0.45	0.031
Nitrate	mg N/L	*11.90*	*12.68*	*9.51*	*6.03*	*4.59*	*2.82*	3.33	2.74	3.94	4.04	2.70	0.19
Nitrite	mg N/L	*0.17*	*0.07*	*0.17*	*0.11*	*0.24*	*0.26*	0.25	0.22	0.16	0.33	0.32	< 0.01
Total phosphorus	mg/L	*-*	*-*	*-*	*-*	*0.04*	*0.08*	0.07	< 0.01	< 0.01	< 0.01	0.33	< 0.04
Total Metals													
Aluminum	mg/L	*0.042*	*1.218*	*0.498*	*0.321*	*0.073*	*0.410*	< 0.006	0.054	0.051	0.085	2.139	0.124
Arsenic	mg/L	*0.1055*	*0.0179*	*0.0213*	*0.0005*	*0.2507*	*0.3950*	0.4554	0.3449	0.7639	0.3715	0.4267	0.0078
Barium	mg/L	*0.0164*	*0.0200*	*0.0197*	*0.0099*	*0.0230*	*0.0473*	0.0537	0.0535	0.0628	0.0417	0.0506	0.0216
Cadmium	mg/L	*0.00024*	*0.00036*	*0.00010*	*0.00003*	*0.00011*	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Calcium	mg/L	*-*	*-*	*-*	*-*	*191*	*215*	223	216	323	222	285	19

ST-17/ST-17 Lake	Sample date	Annual average						6/21/2020	7/8/2020	8/12/2020	9/10/2020	10/7/2020	10/18/2020
Parameter	**Unit**	***2015 ****	***2016 ****	***2017 ****	***2018 ****	***2019 *****	***2020***	*****	*****				
Chromium	mg/L	*0.0018*	*0.0330*	*0.0032*	*0.0006*	*0.0013*	*0.0034*	< 0.0006	0.0007	< 0.0006	0.0037	0.0139	< 0.0006
Copper	mg/L	*0.001*	*0.004*	*0.001*	*0.002*	*0.027*	*0.514*	0.186	0.741	1.600	0.250	0.294	0.0129
Iron	mg/L	*0.05*	*3.89*	*1.03*	*0.77*	*0.32*	*1.30*	< 0.01	0.15	0.37	0.27	5.50	0.20
Lead	mg/L	*0.0011*	*0.0019*	*0.0019*	*0.0016*	*0.0003*	*0.0005*	< 0.0003	< 0.0003	< 0.00017	0.0016	< 0.00017	< 0.00017
Magnesium	mg/L	*-*	*-*	*-*	*-*	*37.8*	*18.6*	12.6	17.7	21.6	24.5	32.7	2.4
Manganese	mg/L	*0.1135*	*0.2196*	*0.1453*	*0.1261*	*0.8147*	*0.2574*	0.0893	0.188	0.3107	0.2819	0.6247	0.0498
Mercury	mg/L	*0.00010*	*0.00003*	*0.00004*	*0.00001*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.1783*	*0.1170*	*0.0589*	*0.0231*	*0.1400*	*0.0952*	0.0681	0.0920	0.1182	0.1592	0.1321	0.0014
Nickel	mg/L	*0.0305*	*0.0382*	*0.0664*	*0.0242*	*0.0597*	*0.1076*	0.1341	0.1245	0.1754	0.0944	0.1048	0.0126
Potassium	mg/L	*-*	*-*	*-*	*-*	*50.60*	*79.22*	75.88	81.39	129.26	80.30	103.98	4.51
Selenium	mg/L	*0.0015*	*0.0013*	*0.0011*	*0.0010*	*0.0035*	*0.0224*	0.0200	0.0200	0.0380	0.0210	0.0349	< 0.0005
Silver	mg/L	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0004*	< 0.0001	< 0.0001	0.0012	0.0005	< 0.0001	< 0.0001
Sodium	mg/L	*-*	*-*	*-*	*-*	*280*	*204*	174	198	322	206	321	3
Thallium	mg/L	*0.0050*	*0.0011*	*0.0008*	*0.0008*	*0.0002*	*0.0007*	< 0.0002	< 0.0002	< 0.0002	0.0003	< 0.0002	< 0.0002
Zinc	mg/L	*0.002*	*0.005*	*0.003*	*0.001*	*0.001*	*0.072*	< 0.001	< 0.001	< 0.001	< 0.001	0.002	0.037
Dissolved Metals													
Aluminum	mg/L	*0.006*	*0.009*	*0.020*	*0.023*	*0.008*	*0.012*	< 0.006	< 0.006	< 0.006	0.042	0.006	< 0.005
Arsenic	mg/L	*0.0205*	*0.0140*	*0.0203*	*0.0005*	*0.2721*	*0.3454*	0.4554	0.3763	0.5606	0.3335	0.3388	0.0077
Barium	mg/L	*0.0092*	*0.0207*	*0.0159*	*0.0093*	*0.0273*	*0.0483*	0.0537	0.0612	0.0589	0.0412	0.0489	0.0258
Cadmium	mg/L	*0.00002*	*0.00037*	*0.00009*	*0.00005*	*0.00012*	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*-*	*-*	*0.0010*	*0.0006*	*0.0006*	*0.0055*	< 0.0006	< 0.0006	< 0.0006	0.003	< 0.0006	< 0.0006
Copper	mg/L	*0.0008*	*0.0013*	*0.0017*	*0.0014*	*0.0249*	*0.3274*	0.1857	0.5507	0.9296	0.1812	0.1161	0.001
Iron	mg/L	*0.01*	*0.01*	*0.02*	*0.01*	*0.07*	*0.02*	< 0.01	< 0.01	< 0.01	0.06	< 0.01	0.02
Lead	mg/L	*0.0003*	*0.0003*	*0.0010*	*0.0003*	*0.0003*	*0.0005*	< 0.0003	< 0.0003	< 0.00017	0.0018	< 0.00017	< 0.00017
Manganese	mg/L	*0.0706*	*0.1373*	*0.1255*	*0.1250*	*0.8817*	*0.2039*	0.0893	0.1462	0.2606	0.2303	0.4792	0.0176
Mercury	mg/L	*0.00001*	*0.00005*	*0.00002*	*0.00001*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0647*	*0.1319*	*0.0592*	*0.0230*	*0.1533*	*0.0898*	0.0681	0.0814	0.1085	0.1504	0.1284	0.0017
Nickel	mg/L	*0.0228*	*0.0325*	*0.0290*	*0.0222*	*0.0640*	*0.0919*	0.1341	0.1153	0.1479	0.0744	0.0787	0.0007
Selenium	mg/L	*0.0010*	*0.0020*	*0.0011*	*0.0010*	*0.0075*	*0.0225*	0.0200	0.0120	0.0340	0.0230	0.0235	< 0.0005

ST-17/ST-17 Lake	Sample date	Annual average						6/21/2020	7/8/2020	8/12/2020	9/10/2020	10/7/2020	10/18/2020
Parameter	**Unit**	***2015 ****	***2016 ****	***2017 ****	***2018 ****	***2019 *****	***2020***	***	***				
Silver	mg/L	*0.0001*	*0.0001*	*0.0002*	*0.0001*	*0.0001*	*0.0002*	< 0.0001	< 0.0001	0.0005	0.0002	< 0.0001	< 0.0001
Strontium	mg/L	-	-	-	-	-	*0.573*	0.572	0.537	0.711	0.546	0.758	0.315
Thallium	mg/L	*0.0050*	*0.0008*	*0.0008*	*0.0008*	*0.0002*	*0.0004*	< 0.0002	< 0.0002	< 0.0002	0.0011	< 0.0002	< 0.0002
Zinc	mg/L	*0.001*	*0.002*	*0.001*	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

* Annual average from 2015 to 2018 refer to ST-17 Sump

** Annual average for 2019 is ST-17 Lake

*** ST-17 Lake Samples prior to tailings deposition in Pit

Table 8-27 Meadowbank 2020 South Portage Pit Lake Water Quality Monitoring (ST-19 Lake)

ST-19 LAKE	Sample date	*Annual Average*		8/18/2020	9/8/2020	10/14/2020
Parameter	**Unit**	***2019***	***2020***			
Field Measured						
pH	pH units	*7.45*	*898*	2677	8.33	8.41
Turbidity	NTU	*5.80*	*7.22*		4.73	9.70
Conventional Parameters						
Hardness	mg CaCO3/L	*300*	*989*	871	1026	1070
Total alkalinity, as CaCO3	mg CaCO3/L	*61*	*87*	90	83	87
Total acidity	mg/L	*-*	*6*	< 5	9	< 5
TSS	mg/L	*9.5*	*15*	1	17	27
TDS	mg/L	*565*	*717*	17	1993	141
Dissolved organic carbon	mg/L	*4.7*	*33*	17.7	26.9	54.4
Major Ions						
Chloride	mg/L	*31.2*	*149*	200	245.3	1.8
Fluoride	mg/L	*0.47*	*0.34*	0.39	0.35	0.28
Sulphate	mg/L	*266.5*	*1407*	1150	1400	1670
Cyanide	mg/L	*0.15*	*0.083*	0.049	0.069	0.132
Nutrients and Chlorophyll a						
Total ammonia as NH4	mg N/L	*9.58*	*14.82*	14.72	28.78	0.97
Un-Ionized Ammonia, calculated	mg NH3/L	*0.18*	*0.49*	0.28	1.15	0.05
Nitrate	mg N/L	*17.5*	*5.25*	2.04	6.33	7.37
Nitrite	mg N/L	*0.53*	*0.13*	0.08	0.13	0.19
Total phosphorus	mg/L	*0.02*	*0.01*	< 0.01	< 0.01	0.01
Total Metals						
Aluminum	mg/L	*0.048*	*0.174*	0.019	0.211	0.293
Arsenic	mg/L	*0.0018*	*0.619*	0.0108	0.8886	0.9561
Barium	mg/L	*0.0155*	*0.065*	0.0292	0.0992	0.0676
Cadmium	mg/L	*0.00002*	*0.00002*	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.0020*	*0.0025*	< 0.0006	0.0024	0.0045
Copper	mg/L	*0.001*	*0.1829*	0.0028	0.206	0.34
Iron	mg/L	*0.26*	*0.52*	0.07	0.53	0.95
Lead	mg/L	*0.00030*	*0.00025*	< 0.00017	< 0.00017	0.0004
Manganese	mg/L	*0.1608*	*0.502*	1.351	0.0863	0.0699
Mercury	mg/L	*0.00006*	*0.00001*	< 0.00001	0.00001	< 0.00001
Molybdenum	mg/L	*0.052*	*0.175*	0.1804	0.1881	0.1558
Nickel	mg/L	*0.0305*	*0.192*	0.0338	0.1416	0.4009
Selenium	mg/L	*0.001*	*0.062*	< 0.001	0.077	0.109
Silver	mg/L	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001
Sodium	mg/L	*43.8500*	*391*	391	370	411
Strontium	mg/L	*0.5080*	*0.938*	0.924	0.952	-
Thallium	mg/L	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.001*	*0.001*	< 0.001	< 0.001	0.001

Dissolved Metals						
Aluminum	mg/L	*0.00925*	*0.008*	< 0.006	0.012	< 0.005
Arsenic	mg/L	*0.00125*	*0.5590*	0.0012	0.720	0.956
Barium	mg/L	*0.00125*	*0.060*	0.0201	0.091	0.0677
Cadmium	mg/L	*0.01365*	*0.00002*	< 0.00002	< 0.00002	0.00002
Chromium	mg/L	*0.00002*	*0.0006*	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.0006*	*0.174*	< 0.0005	0.199	0.3232
Iron	mg/L	*0.0015*	*0.01*	< 0.01	< 0.01	< 0.01
Lead	mg/L	*0.045*	*0.00017*	< 0.00017	< 0.00017	< 0.00017
Manganese	mg/L	*0.0003*	*0.454*	1.2296	0.0713	0.0604
Mercury	mg/L	*0.15025*	*0.00001*	< 0.00001	< 0.00001	0.00001
Molybdenum	mg/L	*0.00001*	*0.164*	0.1618	0.1702	0.1588
Selenium	mg/L	*0.0005*	*0.061*	< 0.001	0.072	0.109
Silver	mg/L	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001
Strontium	mg/L	*0.497*	*0.975*	0.995	0.832	1.099
Thallium	mg/L	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001

8.5.3.1.10 Goose 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. 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. On May 24th, 2019, Agnico received from NWB the Ministers Approval regarding the Amendment No.3 to Type A Water Licence No. 2AM-MEA1526 to authorize Water Uses and Waste Deposits associated with the In-Pit Tailings Disposal. In-Pit Deposition in Goose Pit started on July 5th, 2019.

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 2020, Agnico collected six monthly water quality samples at the bottom of the pit at station ST-20 Goose Pit Lake. Results of sampling conducted at station ST-20 Goose Pit Lake are presented in Table 8-28; the sampling location is illustrated on Figure 1. Four samples were also collected monthly during open water in from June 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 8-29, 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.

8.5.3.1.11 Tailings Storage Facility (ST-21)

The North Cell Tailings Storage Facility became operational in February 2010. On November 17th, 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. On July 5th, 2019, tailings deposition started in Bay Goose Pit. 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 8-30 . The location of sampling station ST-21 (South Cell TSF) is illustrated on Figure 1. As per the water license, no further monitoring in the TSF North Cell is required.

8.5.3.1.12 Vault Pit (ST-26)

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 2020 water from Vault Pit sump (ST-23) was no longer sampled due to the natural reflooding of the Pit, samples are now collected from the Vault Pit Lake (ST-26) (Table 8-31). The Vault Pit Lake was sampled monthly during open water as per the requirements in the NWB Water License (sampling station ST-26 on Figure 3). Agnico Eagle will continue to maximize efforts in ensuring that water sample will be collected in open water season month. In 2020, no water was pumped to the Vault Attenuation Pond as per previous years. Water is rather kept in the pit and contribute to the natural reflooding. There are no applicable license limits for ST-26.

Table 8-28 Meadowbank 2020 Goose Pit Lake Water Quality Monitoring (ST-20 Lake)

ST-20 LAKE	Sample date	Annual Average						6/18/2020	7/8/2020	7/10/2020	8/11/2020	9/10/2020	10/7/2020
Parameter	Unit	2015	2016	2017	2018	2019	2020						
Field Measured													
pH	pH units	-	7.76	7.53	7.32	-	8.28	7.87	8.47	8.64	8.46	7.77	8.44
Turbidity	NTU	-	28.21	14.91	9.77	-	3.85	6.12	0.56	1.00	0.59	3.32	11.5
Conventional Parameters													
Hardness	mg CaCO3/L	104	173	172	115	405	817	164	931	975	956	801	1077
Total alkalinity, as CaCO3	mg CaCO3/L	75	81	85	62	61	81	26	63	63	68	120	148
TSS	mg/L	1	12	9	6	20	11	6	1	3	2	5	51
TDS	mg/L	217	390	379	218	803	1493	439	1572	1600	1748	1769	1831
Dissolved organic carbon	mg/L	-	0	3	4	9	17	5	22	< 0.2	34.7	29.1	9.3
Carbonate	mg/L	2	2	2	2	2	7	< 2	< 5	< 5	< 5	< 5	17
Bicarbonate	mg/L	75	81	85	36	61	78	26	63	63	68	120	130
Major Ions													
Chloride	mg/L	13.7	24.6	25.3	14.4	80.0	223.7	22.0	496.9	216.1	202.8	207.9	196.7
Reactive Silica	mg/L	2.75	5.28	5.43	5.88	12.70	7.22	3.85	10.24	7.16	7.04	7.68	7.37
Sulphate	mg/L	46	146	149	80	469	943	176	998	946	1070	1220	1250
Cyanide	mg/L	0.005	0.005	0.006	0.001	0.152	0.370	0.065	1.200	0.777	0.152	0.014	0.014
Nutrients and Chlorophyll a													
Total ammonia as NH4	mg N/L	0.57	3.65	0.95	0.16	10.50	22.45	5.21	26.33	22.00	31.62	33.46	16.09
Un-Ionized Ammonia, calculated	mg NH3/L	-	0.08	0.03	0.01	0.32	0.69	0.05	0.94	0.46	0.97	0.82	0.89
Nitrate	mg N/L	4.11	2.92	3.83	2.19	1.90	3.91	1.04	4.97	0.83	5.68	5.03	5.89
Nitrite	mg N/L	0.08	0.26	0.09	0.04	0.02	0.18	0.05	0.13	0.23	0.23	0.17	0.27
Total nitrogen	mg N/L	0.49	3.44	1.39	0.78	17.60	43.30	9.8	42	45	56	56	51
Total phosphorus	mg/L	0.01	0.02	0.03	0.06	0.06	0.06	0.05	0.06	0.23	< 0.01	< 0.01	0.02
Total orthophosphate (as phosphorus)	mg/L	0.01	0.04	0.01	0.04	0.05	1.38	0.08	5.94	1.52	0.31	0.19	0.24
Total Metals													
Aluminum	mg/L	0.011	0.400	0.360	0.107	0.588	0.169	0.124	0.020	0.059	0.010	0.029	0.774
Antimony	mg/L	0.0018	0.0015	0.0008	0.0002	0.0040	0.0133	< 0.0001	0.0107	0.0152	0.0132	0.0214	0.0189
Arsenic	mg/L	0.006	0.001	0.001	0.003	0.019	0.834	0.159	0.755	0.880	1.042	0.991	1.181
Barium	mg/L	0.0166	0.0480	0.0540	0.0310	0.0383	0.0637	0.0260	0.0760	0.0798	0.0465	0.0699	0.0838
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005

ST-20 LAKE	Sample date	Annual Average						6/18/2020	7/8/2020	7/10/2020	8/11/2020	9/10/2020	10/7/2020
Parameter	Unit	2015	2016	2017	2018	2019	2020						
Boron	mg/L	0.11	0.06	0.08	0.06	0.03	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	0.00002	0.00003	0.00002	0.00002	0.00024	0.00050	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00290	< 0.00002
Chromium	mg/L	0.0007	0.0035	0.0036	0.0016	0.0094	0.0016	< 0.0006	< 0.0006	0.0010	< 0.0006	0.0012	0.0057
Copper	mg/L	0.070	0.002	0.001	0.001	0.561	2.526	0.865	6.000	5.910	1.920	0.212	0.248
Iron	mg/L	0.0003	0.85	0.80	0.15	1.03	0.46	0.28	0.03	0.15	0.02	0.07	2.2
Lead	mg/L	0.0050	0.0006	0.0072	0.0003	0.0003	0.0002	< 0.0003	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017
Lithium	mg/L	11.100	0.005	0.004	0.005	0.013	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.006
Manganese	mg/L	0.0001	0.1500	0.0980	0.0121	0.0509	0.0474	0.0635	0.0259	0.0243	0.0232	0.0686	0.0788
Mercury	mg/L	0.01450	0.00002	0.00006	0.00001	0.00002	0.00001	< 0.0000100	0.00002	< 0.0000100	0.00001	0.00001	< 0.00001
Molybdenum	mg/L	0.0097	0.0240	0.0207	0.0148	0.1281	0.1025	0.0235	0.1163	0.1225	0.1159	0.1046	0.1321
Nickel	mg/L	5.8100	0.0120	0.0170	0.0121	0.0232	0.1656	0.0565	0.2038	0.2251	0.2111	0.1401	0.1567
Selenium	mg/L	0.00100	0.00100	0.00170	0.00095	0.00520	0.04793	0.008	0.05	0.047	0.069	0.053	0.0606
Strontium	mg/L	0.18	0.27	0.33	0.20	0.62	0.69	0.20	0.92	0.80	0.75	0.61	0.88
Thallium	mg/L	0.0050	0.0008	0.0008	0.0002	0.0002	0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L	0.01	0.06	0.06	0.02	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01
Uranium	mg/L	0.003	0.009	0.011	0.007	0.013	0.008	0.002	0.010	0.011	0.008	0.007	0.010
Vanadium	mg/L	0.0005	0.0005	0.0007	0.0001	0.0020	0.0008	< 0.0005	0.0005	0.0006	0.0008	0.0011	0.0014
Zinc	mg/L	0.002	0.003	0.002	0.002	0.003	0.003	< 0.001	< 0.001	< 0.001	0.003	0.01	< 0.001
Dissolved Metals													
Aluminum	mg/L	0.006	0.006	0.006	0.030	0.024	0.009	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	0.023
Antimony	mg/L	0.0020	0.0015	0.0007	0.0003	0.0032	0.0128	< 0.0001	0.0117	0.0136	0.01470	0.0176	0.0189
Arsenic	mg/L	0.0005	0.0005	0.0008	0.0029	0.0146	0.7832	0.1055	0.7555	0.8072	0.8823	0.9793	1.1694
Barium	mg/L	0.0163	0.0450	0.0480	0.0276	0.0303	0.0552	0.0166	0.0762	0.0585	0.0389	0.0645	0.0766
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0007	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	0.12	0.05	0.07	0.07	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	0.00002	0.00003	0.00002	0.00006	0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.0006	0.0017	0.0006	0.0018	0.0006	0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.0005	0.0006	0.0009	0.0009	0.3543	0.6846	0.1403	2.269	0.3645	1.0352	0.2037	0.0948
Iron	mg/L	0.01	0.01	0.02	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Lead	mg/L	0.0003	0.0005	0.0054	0.0003	0.0003	0.0002	< 0.0003	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017

ST-20 LAKE	Sample date	*Annual Average*						6/18/2020	7/8/2020	7/10/2020	8/11/2020	9/10/2020	10/7/2020
Parameter	**Unit**	***2015***	***2016***	***2017***	***2018***	***2019***	***2020***						
Lithium	mg/L	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.006
Manganese	mg/L	*0.0058*	*0.1200*	*0.0720*	*0.0043*	*0.0309*	*0.0265*	0.0412	0.0227	0.0185	0.0180	0.0155	0.0432
Mercury	mg/L	*0.00006*	*0.00014*	*0.00004*	*0.00001*	*0.00001*	*0.00001*	< 0.00001	0.00001	0.00001	< 0.00001	< 0.00001	0.00002
Molybdenum	mg/L	*0.015*	*0.023*	*0.021*	*0.012*	*0.103*	*0.094*	0.017	0.118	0.098	0.093	0.103	0.134
Nickel	mg/L	*0.010*	*0.010*	*0.013*	*0.010*	*0.015*	*0.143*	0.040	0.187	0.191	0.167	0.119	0.156
Selenium	mg/L	*0.001*	*0.001*	*0.001*	*0.001*	*0.002*	*0.038*	0.004	0.039	0.037	0.044	0.056	0.048
Silver	mg/L	*0.1930*	*0.2800*	*0.3200*	*0.1955*	*0.5140*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	mg/L	*0.010*	*0.030*	*0.048*	*0.015*	*0.010*	*0.629*	0.147	0.856	0.654	0.592	0.622	0.902
Titanium	mg/L	*0.0050*	*0.0008*	*0.0008*	*0.0002*	*0.0002*	*0.0100*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Uranium	mg/L	*0.003*	*0.008*	*0.012*	*0.007*	*0.011*	*0.007*	0.002	0.010	0.007	0.007	0.006	0.010
Vanadium	mg/L	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0007*	< 0.0005	0.0006	0.0006	< 0.0005	0.0008	0.0012
Zinc	mg/L	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Table 8-29 Meadowbank 2020 Goose Pit Sump Water Quality Monitoring (ST-20)

ST-20 SUMP	Sample date	Annual Average								6/15/2020	7/8/2020	8/11/2020	9/10/2020
Parameter	**Unit**	***2013***	***2014***	***2015***	***2016***	***2017***	***2018***	***2019***	***2020***				
Field Measured													
pH	pH units	*7.68*	*7.97*	*7.37*	*7.73*	*7.92*	*7.48*	*8.49*	*7.88*	7.20	7.92	8.29	8.12
Turbidity	NTU	*52.61*	*27.34*	*41.13*	*23.77*	*9.02*	*13.50*	*12.94*	*17.99*	56.70	4.29	2.11	8.85
Conventional Parameters													
TSS	mg/L	*-*	*-*	*7*	*18*	*5*	*8*	*8*	*9*	21	2	3	10
Total Dissolved Solids	mg/L	*314*	*530*	*180*	*238*	*423*	*236*	*225*	*228*	78	252	284	298
Major Ions													
Chloride	mg/L	*62.2*	*52.5*	*22.2*	*13.4*	*12.7*	*7.7*	*5.0*	*5.6*	2.0	5.8	6.8	7.6
Fluoride	mg/L	*0.72*	*0.94*	*0.40*	*0.34*	*-*	*0.20*	*0.17*	*0.19*	0.07	0.18	0.25	0.27
Sulphate	mg/L	*0.7*	*0.9*	*0.4*	*0.3*	*-*	*0.2*	*0.2*	*108.0*	24.8	106.0	140.0	161.0
Cyanide	mg/L	*-*	*-*	*0.008*	*0.004*	*0.002*	*0.003*	*0.001*	*0.001*	< 0.001	0.002	0.001	< 0.001
Nutrients and Chlorophyll a													
Total ammonia as NH4	mg N/L	*0.30*	*0.06*	*1.13*	*0.10*	*1.16*	*0.16*	*0.59*	*0.05*	0.12	< 0.01	< 0.01	0.04
Un-Ionized Ammonia, calculated	mg NH3/L	*-*	*-*	*0.02*	*0.01*	*0.02*	*0.01*	*0.02*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg N/L	*20.80*	*10.85*	*2.96*	*3.71*	*13.22*	*5.37*	*3.79*	*3.48*	0.50	4.27	4.49	4.66
Nitrite	mg N/L	*0.54*	*0.26*	*0.19*	*0.023*	*0.13*	*0.02*	*0.04*	*0.03*	0.05	0.02	0.02	< 0.01
Total Metals													
Aluminum	mg/L	*-*	*-*	*0.305*	*0.387*	*0.112*	*0.200*	*0.200*	*0.400*	1.408	0.032	0.006	0.152
Arsenic	mg/L	*-*	*-*	*0.0014*	*0.0006*	*0.0029*	*0.0015*	*0.0019*	*0.0062*	0.0074	0.0016	0.0065	0.0094
Barium	mg/L	*-*	*-*	*0.0276*	*0.0210*	*0.0410*	*0.0218*	*0.0201*	*0.0169*	0.0131	0.0276	0.0048	0.0219
Cadmium	mg/L	*-*	*-*	*0.00002*	*0.00005*	*0.00003*	*0.00002*	*0.00002*	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*-*	*-*	*0.0006*	*0.0033*	*0.0006*	*0.0027*	*0.0029*	*0.0040*	0.0129	< 0.0006	< 0.0006	0.0017
Copper	mg/L	*-*	*-*	*0.0023*	*0.0030*	*0.0020*	*0.0015*	*0.0019*	*0.0036*	0.0069	0.0005	0.0042	0.0029
Iron	mg/L	*-*	*-*	*0.69*	*0.67*	*0.21*	*0.32*	*0.36*	*0.68*	2.30	0.08	0.03	0.30
Lead	mg/L	*-*	*-*	*0.0005*	*0.0003*	*0.0003*	*0.0003*	*0.0003*	*0.0004*	0.0009	< 0.0003	< 0.00017	< 0.00017
Manganese	mg/L	*-*	*-*	*0.2682*	*0.0680*	*0.0990*	*0.1174*	*0.0529*	*0.0460*	0.1004	0.0378	0.0088	0.0368
Mercury	mg/L	*-*	*-*	*0.00001*	*0.00001*	*0.00002*	*0.00001*	*0.00001*	*0.00001*	< 0.00001	0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*-*	*-*	*0.0138*	*0.0068*	*0.0066*	*0.0049*	*0.0048*	*0.0033*	0.0010	0.0039	0.0042	0.0042
Nickel	mg/L	*-*	*-*	*0.0380*	*0.0400*	*0.0760*	*0.0754*	*0.0338*	*0.0840*	0.0360	0.1103	0.0905	0.0993
Selenium	mg/L	*-*	*-*	*0.001*	*0.001*	*0.002*	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	0.001
Silver	mg/L	*-*	*-*	*0.0001*	*0.0001*	*0.0017*	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*-*	*-*	*0.0050*	*0.0011*	*0.0008*	*0.0004*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*-*	*-*	*0.001*	*0.003*	*0.002*	*0.002*	*0.001*	*0.003*	0.007	< 0.001	< 0.001	< 0.001

Table 8-30 Meadowbank 2020 Tailings Reclaim Pond Water Quality Monitoring (ST-21)

ST-21	Sample date	*Annual Average*								6/18/2020	7/7/2020	8/31/2020	9/7/2020
Parameter	Unit	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*				
Field Measured													
pH	pH units	*8.40*	*7.84*	*7.99*	*8.14*	*8.22*	*8.24*	*8.03*	*7.91*	7.99	7.75	8.10	7.81
Turbidity	NTU	*15.3*	*6.0*	*10.7*	*10.6*	*7.9*	*16.3*	*16.2*	*19.7*	19.5	4.23	32.3	22.8
Conventional Parameters													
Total alkalinity, as CaCO3	mg CaCO3/L	*125*	*100*	*123*	*125*	*127*	*118*	*79*	*75*	38	67	90	105
TSS	mg/L	*-*	*14*	*13*	*21*	*11*	*8*	*15*	*35*	14	4	82	39
TDS	mg/L	*2949*	*3669*	*2499*	*2338*	*3033*	*2628*	*1606*	*735*	530	821	714	873
Major Ions													
Fluoride	mg/L	*2.17*	*2.59*	*0.65*	*0.58*	*0.40*	*0.47*	*0.42*	*0.26*	0.15	0.24	0.34	0.32
Sulphate	mg/L	*2034*	*2218*	*1645*	*1939*	*1855*	*2151*	*1153*	*383*	274	296	524	439
Cyanide	mg/L	*11.35*	*10.24*	*0.31*	*0.64*	*0.17*	*0.08*	*0.95*	*0.02*	0.015	0.024	0.041	0.017
Nutrients and Chlorophyll a													
Total ammonia as NH4	mg N/L	*25.70*	*0.70*	*37.57*	*42.32*	*43.57*	*50.48*	*22.31*	*5.95*	4.21	11.16	2.6	5.83
Un-Ionized Ammonia, calculated	mg NH3/L	*-*	*-*	*3.11*	*1.96*	*1.28*	*1.87*	*0.67*	*0.11*	0.05	0.17	0.09	0.12
Nitrate	mg N/L	*15.20*	*26.19*	*9.45*	*7.20*	*3.69*	*4.86*	*4.35*	*4.49*	1.02	0.59	8.08	8.25
Nitrite	mg N/L	*0.55*	*0.42*	*0.33*	*0.19*	*0.24*	*0.63*	*0.27*	*0.35*	0.04	0.2	0.73	0.44
Total Metals													
Aluminum	mg/L	*0.253*	*0.163*	*0.090*	*0.144*	*0.110*	*0.238*	*0.099*	*0.453*	0.333	0.036	0.922	0.52
Arsenic	mg/L	*0.0192*	*0.0107*	*0.0170*	*0.0150*	*0.0086*	*0.0171*	*0.0218*	*0.0190*	0.0107	0.0080	0.0359	0.0215
Barium	mg/L	*0.071*	*0.008*	*0.075*	*0.093*	*0.086*	*0.137*	*0.042*	*0.029*	0.015	0.024	0.035	0.041
Cadmium	mg/L	*0.00072*	*0.00101*	*0.00078*	*0.00130*	*0.00150*	*0.00270*	*0.00008*	*0.00003*	< 0.00002	< 0.00002	0.00006	< 0.00002
Chromium	mg/L	*0.0010*	*0.0006*	*0.0015*	*0.0013*	*0.0015*	*0.0023*	*0.0015*	*0.0031*	0.0035	< 0.0006	0.0055	0.0029
Copper	mg/L	*3.292*	*3.400*	*1.100*	*0.460*	*0.370*	*0.908*	*1.605*	*0.079*	0.040	0.020	0.183	0.073
Iron	mg/L	*0.36*	*0.42*	*0.63*	*1.01*	*0.05*	*1.09*	*0.47*	*1.24*	0.94	0.13	2.50	1.40
Lead	mg/L	*0.0024*	*0.0005*	*0.0005*	*0.0007*	*0.0014*	*0.0031*	*0.0021*	*0.0050*	0.0033	< 0.0003	0.0124	0.0041
Manganese	mg/L	*0.3343*	*0.0674*	*0.6900*	*0.2100*	*0.2800*	*0.4865*	*0.3420*	*0.5820*	0.2711	0.3752	0.6707	1.0110
Mercury	mg/L	*0.00015*	*0.00035*	*0.00025*	*0.00035*	*0.00027*	*0.00019*	*0.00002*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.3519*	*0.3672*	*0.3100*	*0.4200*	*0.5300*	*0.5168*	*0.2373*	*0.0590*	0.0476	0.0683	0.0605	0.0594
Nickel	mg/L	*0.2640*	*0.6694*	*0.1100*	*0.0520*	*0.1300*	*0.1203*	*0.0993*	*0.0305*	0.0158	0.0166	0.0493	0.0401
Selenium	mg/L	*0.030*	*0.177*	*0.062*	*0.073*	*0.048*	*0.070*	*0.005*	*0.001*	< 0.001	0.002	0.001	< 0.001
Silver	mg/L	*-*	*-*	*0.0014*	*0.0009*	*0.0004*	*0.0002*	*0.0004*	*0.0001*	< 0.0001	< 0.0001	0.0001	< 0.0001
Thallium	mg/L	*0.1480*	*0.0050*	*0.0050*	*0.0017*	*0.0008*	*0.0006*	*0.0006*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.004*	*0.010*	*0.003*	*0.004*	*0.010*	*0.005*	*0.005*	*0.004*	0.006	< 0.001	< 0.001	0.008

Table 8-31 Meadowbank 2020 Vault Pit Sump Water Quality Monitoring (ST-26)

ST-26	Sample date	*Annual Average*	6/21/2020	7/7/2020	8/18/2020	9/8/2020	10/14/2020
Parameter	**Unit**						
Field Measured							
pH	pH units	*7.99*	-	8.17	7.83	7.99	7.98
Turbidity	NTU	*1.61*	-	2.33	-	1.46	1.04
Conventional Parameters							
Hardness	mg CaCO3/L	*119*	53	111	140	149	141
Total alkalinity, as CaCO3	mg CaCO3/L	*55*	34	46	56	65	74
TSS	mg/L	*20*	87	1	2	6	2
TDS	mg/L	*125*	101	137	187	188	12
Total organic carbon	mg/L	*2.3*	0.7	2	1.9	2.9	4
Dissolved organic carbon	mg/L	*2.4*	1.2	1.7	1.1	2.8	5
Carbonate	mg/L	*5.00*	-	< 5	< 5	< 5	< 5
Bicarbonate	mg/L	*55.60*	34	46	59	65	74
Total Dissolved Solids	mg/L	*125.00*	101	137	187	188	12
Major Ions							
Chloride	mg/L	*8.28*	3.1	12	9.4	8.6	8.3
Reactive silica	mg/L	*3.86*	2.06	3.26	4.02	5.43	4.53
Sulphate	mg/L	*61.8*	30.3	45.0	66.7	67.9	98.9
Thiocyanate	mg/L	*0.05*	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Cyanate	mg/L	*0.01*	< 0.01	< 0.01	< 0.01	0.01	< 0.01
Cyanide (WAD)	mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Cyanide	mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Nutrients and Chlorophyll a							
Total ammonia as NH4	mg N/L	*0.15*	0.21	0.12	0.11	0.12	0.18
Un-Ionized Ammonia, calculated	mg NH3/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg N/L	*2.23*	0.84	1.8	2.63	2.91	2.96
Nitrite	mg N/L	*0.02*	0.03	0.02	0.01	0.02	0.01
Total nitrogen	mg N/L	*0.36*	0.18	0.36	0.32	0.32	0.6

ST-26	Sample date	Annual Average	6/21/2020	7/7/2020	8/18/2020	9/8/2020	10/14/2020
Parameter	Unit						
Total phosphorus	mg/L	*0.03*	0.1	< 0.01	< 0.01	< 0.01	< 0.01
Total orthophosphate (as phosphorus)	mg/L	*0.02*	0.03	0.02	< 0.01	< 0.01	< 0.01
Total Metals							
Aluminum	mg/L	*0.027*	< 0.006	0.043	0.036	0.037	0.013
Antimony	mg/L	*0.0003*	< 0.0001	< 0.0001	< 0.0001	0.0004	0.0009
Arsenic	mg/L	*0.0045*	0.0055	0.0033	0.004	0.0052	0.0045
Barium	mg/L	*0.0120*	0.0006	0.0131	0.0138	0.0186	0.0141
Beryllium	mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.0006*	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Cobalt	mg/L	*0.0005*	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Copper	mg/L	*0.0017*	0.0043	0.001	0.0008	0.0011	0.0013
Iron	mg/L	*0.06*	< 0.01	0.14	0.02	0.06	0.05
Lead	mg/L	*0.0002*	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017
Lithium	mg/L	*0.005*	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Manganese	mg/L	*0.0212*	0.0178	0.0452	0.0194	0.0136	0.0102
Mercury	mg/L	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0219*	0.0117	0.0146	0.0220	0.0313	0.0299
Nickel	mg/L	*0.0021*	0.0018	0.0024	0.0019	0.0021	0.0025
Selenium	mg/L	*0.0009*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005
Silver	mg/L	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	mg/L	*0.219*	0.104	0.211	0.224	0.260	0.294
Thallium	mg/L	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	*0.001*	< 0.001	< 0.001	< 0.001	0.001	< 0.001
Titanium	mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Uranium	mg/L	*0.005*	< 0.001	0.004	0.005	0.008	0.008
Vanadium	mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	*0.001*	< 0.001	< 0.001	0.001	< 0.001	< 0.001

ST-26	Sample date	*Annual Average*	6/21/2020	7/7/2020	8/18/2020	9/8/2020	10/14/2020
Parameter	**Unit**						
Dissolved Metals							
Aluminum	mg/L	*0.006*	< 0.006	< 0.006	< 0.006	0.008	< 0.005
Antimony	mg/L	*0.0003*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.001
Arsenic	mg/L	*0.003*	0.0055	0.0030	< 0.0005	0.0038	0.0041
Barium	mg/L	*0.0110*	0.0006	0.0098	0.0132	0.0164	0.0149
Beryllium	mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.0006*	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.001*	0.0043	< 0.0005	< 0.0005	< 0.0005	0.001
Iron	mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Lead	mg/L	*0.0002*	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017
Lithium	mg/L	*0.005*	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Manganese	mg/L	*0.0112*	0.0178	0.0294	0.0034	0.0026	0.0026
Mercury	mg/L	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00001
Molybdenum	mg/L	*0.0188*	0.0117	0.0128	0.0158	0.0252	0.0286
Nickel	mg/L	*0.0015*	0.0018	0.0018	< 0.0005	0.0014	0.0022
Selenium	mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	0.0014
Silver	mg/L	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	mg/L	*0.204*	0.104	0.170	0.241	0.217	0.289
Titanium	mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Uranium	mg/L	*0.004*	< 0.001	0.003	0.005	0.006	0.007
Vanadium	mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

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 2020, water was sampled in June, July, August and September. As per NWB Water License, samples were collected to assess water quality and the results are presented in Table 8-32. 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 8-33 for information purposes only. The location of sampling station ST-25 is illustrated on Figure 3. There was no water pumped out from the Vault Attenuation Pond to Wally Lake in 2020.

Table 8-32 Meadowbank 2020 Vault Waste Rock Storage Facility Seepage Water Quality Monitoring (ST-24)

ST-24	Sample Date	Annual Average							6/17/2020	7/8/2020	8/5/2020	9/9/2020
Parameter	Unit	2014	2015	2106	2017	2018	2019	2020.00				
Field Measured												
pH	pH units	7.34	7.04	7.28	6.36	7.29	7.65	7.71	7.26	7.71	8.02	7.84
Turbidity	NTU	25.90	17.75	74.12	91.60	24.41	6.47	2.88	6.84	2.18	0.67	1.81
Conventional Parameters												
Hardness	mg CaCO3/L	1131	42	169	86	117	85	133	42	58	223	207
Total alkalinity, as CaCO3	mg CaCO3/L	171	37	27	32	42	39	53	20	26	74	91
TSS	mg/L	-	-	26	38	27	5	4	5	1	1	10
TDS	mg/L	58	59	272	118	207	143	175	65	88	260	287
Major Ions												
Chloride	mg/L	3.2	1.6	4.7	1.5	3.6	1.8	4.8	0.7	12.3	2.8	3.4
Fluoride	mg/L	0.07	0.04	0.06	0.08	0.09	0.10	0.09	0.04	0.05	0.12	0.13
Sulphate	mg/L	5.10	-	156	44	102	66	74	18	32	111	134
Cyanide	mg/L	-	-	0.026	0.001	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Nutrients and Chlorophyll a												
Total ammonia as NH4	mg N/L	0.01	0.11	2.52	0.29	0.23	0.19	0.03	0.04	0.02	0.01	0.05
Un-Ionized Ammonia, calculated	mg NH3/L	-	0.01	0.01	0.01	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg N/L	0.02	0.11	2.89	2.41	2.99	2.17	2.29	0.66	1.06	3.79	3.63
Nitrite	mg N/L	0.01	0.01	0.063	0.02	0.03	0.03	0.01	< 0.01	0.01	0.01	0.02
Total Metals												
Aluminum	mg/L	0.07	0.11	0.67	2.01	0.48	0.12	0.09	0.31	0.018	0.008	0.022
Arsenic	mg/L	0.0081	0.0005	0.0005	0.0005	0.0005	0.0045	0.0029	0.0022	0.0015	0.005	0.0027
Barium	mg/L	0.0632	0.0077	0.0350	0.0253	0.0229	0.0150	0.0141	0.0046	0.0082	0.0224	0.0213
Cadmium	mg/L	0.00091	0.00002	0.00008	0.00008	0.00010	0.00006	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.0006	0.0006	0.0006	0.0062	0.0007	0.0009	0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.7477	0.0022	0.0031	0.0072	0.0068	0.0062	0.0036	0.0029	0.0025	0.0041	0.0049
Iron	mg/L	0.49	1.10	8.54	2.92	1.13	0.25	0.17	0.35	0.06	0.03	0.23
Lead	mg/L	0.0003	0.0018	0.0006	0.0003	0.0003	0.0003	0.0002	< 0.0003	< 0.0003	< 0.00017	< 0.00017

ST-24	Sample Date	*Annual Average*							6/17/2020	7/8/2020	8/5/2020	9/9/2020
Parameter	**Unit**	***2014***	***2015***	***2106***	***2017***	***2018***	***2019***	***2020.00***				
Manganese	mg/L	*2.4700*	*0.0860*	*1.4200*	*0.1912*	*0.1888*	*0.0513*	*0.0418*	0.0375	0.0294	0.0304	0.0697
Mercury	mg/L	*0.00005*	*0.00001*	*0.00001*	*0.00001*	*0.00002*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.2110*	*0.0010*	*0.0056*	*0.0072*	*0.0109*	*0.0138*	*0.0156*	0.0064	0.0074	0.0275	0.021
Nickel	mg/L	*0.5806*	*0.0026*	*0.0160*	*0.1250*	*0.0079*	*0.0050*	*0.0045*	0.0031	0.0046	0.0047	0.0057
Selenium	mg/L	*0.099*	*0.001*	*0.001*	*0.001*	*0.002*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	-	-	*0.0001*	*0.0001*	*0.0001*	*0.0003*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0050*	*0.0050*	*0.0012*	*0.0008*	*0.0006*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.009*	*0.001*	*0.012*	*0.013*	*0.004*	*0.006*	*0.001*	< 0.001	< 0.001	< 0.001	0.002

Table 8-33 Meadowbank 2020 Vault Attenuation Pond Water Quality Monitoring (ST-25)

ST-25	Sample date	*Annual Average*							6/17/2020	7/8/2020	8/5/2020	9/9/2020	10/8/2020
Parameter	**Unit**	***2014***	***2015***	***2016***	***2017***	***2018***	***2019***	***2020***					
Field Measured													
pH	pH units	*6.51*	*7.08*	*7.50*	*7.83*	*7.24*	*7.55*	*7.68*	7.16	7.7	8.11	7.94	7.47
Turbidity	NTU	*5.89*	*10.99*	*14.60*	*16.39*	*7.63*	*5.44*	*4.18*	14.90	1.86	2.45	1.02	0.67
Conventional Parameters													
Hardness	mg CaCO3/L	*59*	*70*	*123*	*118*	*102*	*84*	*88*	35	73	108	101	123
Total alkalinity, as CaCO3	mg CaCO3/L	*47*	*42*	*48*	*54*	*36*	*36*	*41*	16	32	53	53	53
TSS	mg/L	*-*	*-*	*8*	*30*	*11*	*4*	*6*	17	1	5	2	3
TDS	mg/L	*151*	*137*	*216*	*188*	*181*	*140*	*114*	50	96	150	135	138
Major Ions													
Chloride	mg/L	*4.1*	*6.8*	*9.7*	*9.8*	*7.1*	*6.1*	*5.4*	1.8	6.9	9.1	4.6	4.6
Fluoride	mg/L	*0.14*	*0.09*	*0.14*	*0.10*	*0.15*	*0.14*	*0.10*	0.06	0.11	0.16	0.07	0.12
Sulphate	mg/L	*23.9*	*7.1*	*65.3*	*88.4*	*74.6*	*58.4*	*43.9*	11.6	31.0	55.9	61.0	59.8
Cyanide	mg/L	*0.009*	*0.008*	*0.013*	*0.005*	*0.002*	*0.001*	*0.001*	< 0.001	0.001	< 0.001	< 0.001	< 0.001
Nutrients and Chlorophyll a													
Total ammonia as NH4	mg N/L	*0.03*	*2.23*	*1.20*	*1.86*	*0.88*	*0.45*	*0.15*	0.17	0.3	0.24	< 0.01	0.02
Un-Ionized Ammonia, calculated	mg NH3/L	*-*	*0.03*	*0.02*	*0.02*	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg N/L	*0.08*	*0.14*	*0.07*	*1.40*	*0.02*	*1.20*	*0.97*	0.18	0.66	1.03	1.68	1.28
Nitrite	mg N/L	*2.30*	*4.67*	*2.75*	*2.19*	*2.69*	*0.01*	*0.05*	< 0.01	0.01	0.06	0.02	0.15
Total Metals													
Aluminum	mg/L	*-*	*0.027*	*0.196*	*0.634*	*0.254*	*0.158*	*0.168*	0.685	0.058	0.069	0.014	0.015
Arsenic	mg/L	*-*	*0.0005*	*0.0008*	*0.0041*	*0.0006*	*0.0017*	*0.0011*	0.0015	0.0012	0.0017	< 0.0005	< 0.0005
Barium	mg/L		*0.0140*	*0.0270*	*0.0230*	*0.0236*	*0.0169*	*0.0179*	0.0104	0.0136	0.0197	0.0218	0.0242
Cadmium	mg/L	*-*	*0.00002*	*0.00004*	*0.00002*	*0.00007*	*0.00009*	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*-*	*0.0011*	*0.0082*	*0.0022*	*0.0020*	*0.0010*	*0.0011*	0.0025	< 0.0006	0.0011	< 0.0006	< 0.0006
Copper	mg/L	*-*	*0.0034*	*0.0025*	*0.0037*	*0.0066*	*0.0073*	*0.0039*	0.0033	0.0063	0.0073	0.001	0.0017
Iron	mg/L	*-*	*0.17*	*0.60*	*0.99*	*0.50*	*0.37*	*0.31*	1.000	0.24	0.29	0.02	0.02
Lead	mg/L	*-*	*0.0006*	*0.0003*	*0.0003*	*0.0003*	*0.0003*	*0.0002*	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017
Manganese	mg/L	*-*	*0.03*	*0.19*	*0.07*	*0.13*	*0.10*	*0.0387*	0.0848	0.0669	0.0303	0.005	0.0063

ST-25	Sample date	*Annual Average*							6/17/2020	7/8/2020	8/5/2020	9/9/2020	10/8/2020
Parameter	**Unit**	***2014***	***2015***	***2016***	***2017***	***2018***	***2019***	***2020***					
Mercury	mg/L	-	*0.00001*	*0.00170*	*0.00001*	*0.00001*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	-	*0.0110*	*0.0110*	*0.0170*	*0.0062*	*0.0033*	*0.0045*	0.0009	0.0016	0.0032	0.0083	0.0085
Nickel	mg/L	-	*0.004*	*0.006*	*0.005*	*0.012*	*0.009*	*0.004*	0.007	0.006	0.004	0.0022	0.0023
Selenium	mg/L	-	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005
Silver	mg/L	-	-	*0.0001*	-	*0.0001*	*0.0003*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	-	*0.0050*	*0.0010*	*0.0008*	*0.0005*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	-	*0.002*	*0.005*	*0.002*	*0.009*	*0.007*	*0.002*	0.004	< 0.001	0.002	< 0.001	< 0.001

8.5.3.1.15 WRSF – 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 2020, 40,786 m^3 of water was pumped from the WEP collection system to the North Cell TSF which includes 23,543 m^3 of water from WEP1 and 17,243 m^3 from WEP2. The water from the WEP collection system is pumped to the ST-16 sump system, and then pumped to the North Cell TSF. Table 8-34 below provide 2016 – 2020 pumped volume for WEP1 and WEP2.

Table 8-34 Meadowbank 2016 -2020 Volume of Water Pumped from WEP 1 and WEP 2

Years	WEP 1 pumped volume (m^3)	WEP 2 pumped volume (m^3)	Total volume system (m^3)
2016	3,694	1,802	5,496
2017	14,456	10,282	24,738
2018	13,923	8,169	22,092
2019	14,680	20,431	35,111
2020	23,543	17,243	40,786

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-MEA1526. There are no applicable license limits. The sampling location is illustrated on Figure 1 and results are presented in Table 8-35 for WEP1 (ST-30) and Table 8-36 for WEP2 (ST-31).

Results of samples collected in 2020 at station ST-5 (East Diversion ditch discharge point into NP2) are documented in Table 8-19. The results from summer 2020 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.

Table 8-35 Meadowbank 2020 Waste Extension Pool WEP1 Water Quality Monitoring (ST-30)

ST-30	Sample Date	*Annual Average*					6/11/2020	7/6/2020	8/4/2020	9/8/2020
Parameter	**Unit**	***2016***	***2017***	***2018***	***2019***	***2020***				
Field Measured										
pH	pH units	*7.36*	*7.49*	*7.42*	*7.42*	*7.36*	7.10	7.43	7.63	7.28
Turbidity	NTU	*15.74*	*44.26*	*8.35*	*7.51*	*6.04*	12.00	2.57	3.76	5.82
Conventional Parameters										
Hardness	mg CaCO3/L	*102*	*157*	*66*	*115*	*113*	14	87	151	198
Total alkalinity, as CaCO3	mg CaCO3/L	*80*	*105*	*54*	*51*	*73*	10	75	117	90
TSS	mg/L	*7*	*14*	*6*	*6*	*6*	4	3	2	15
TDS	mg/L	*221*	*249*	*136*	*169*	*150*	43	121	195	242
Major Ions										
Chloride	mg/L	*6.7*	*6.7*	*2.7*	*2.5*	*2.3*	0.9	2.3	2.9	3.1
Fluoride	mg/L	*0.15*	*0.18*	*0.13*	*0.13*	*0.13*	0.04	0.16	0.19	0.11
Sulphate	mg/L	*55.9*	*71.4*	*32.2*	*44.8*	*34.2*	6.2	24	38.7	67.9
Cyanide (free)	mg/L	*0.005*	*0.007*	*0.005*	*0.054*	*0.002*	< 0.001	0.003	0.003	0.002
Cyanide	mg/L	*0.002*	*0.032*	*0.010*	*0.005*	*0.008*	0.002	0.013	0.016	< 0.001
Nutrients and Chlorophyll a										
Total ammonia as NH4	mg N/L	*2.21*	*1.37*	*0.19*	*0.10*	*0.26*	0.07	0.25	0.19	0.52
Un-Ionized Ammonia, calculated	mg NH3/L	*0.03*	*0.02*	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg N/L	*1.07*	*0.79*	*0.39*	*1.79*	*1.45*	0.36	0.48	0.44	4.53
Nitrite	mg N/L	*0.054*	*0.048*	*0.02*	*0.10*	*0.04*	0.05	0.03	0.05	0.03
Total Metals										
Aluminum	mg/L	*0.246*	*0.864*	*0.122*	*0.072*	*0.113*	0.292	0.012	0.015	0.134
Arsenic	mg/L	*0.001*	*0.042*	*0.005*	*0.008*	*0.003*	0.003	0.004	0.004	0.002
Barium	mg/L	*0.0170*	*0.0190*	*0.0102*	*0.0101*	*0.0149*	0.0042	0.0097	0.0205	0.0251
Cadmium	mg/L	*0.00008*	*0.00002*	*0.00002*	*0.00003*	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.0006*	*0.0036*	*0.0015*	*0.0030*	*0.0013*	0.0030	< 0.0006	< 0.0006	0.0009
Copper	mg/L	*0.017*	*0.012*	*0.011*	*0.014*	*0.012*	0.008	0.017	0.017	0.008
Iron	mg/L	*2.5*	*3.1*	*0.9*	*0.5*	*1.1*	0.4	1.1	1.7	1.2

ST-30	Sample Date	*Annual Average*					6/11/2020	7/6/2020	8/4/2020	9/8/2020
Parameter	**Unit**	***2016***	***2017***	***2018***	***2019***	***2020***				
Lead	mg/L	*0.0012*	*0.0009*	*0.0003*	*0.0003*	*0.0003*	< 0.0003	< 0.0003	< 0.0003	< 0.00017
Mercury	mg/L	*0.00018*	*0.00001*	*0.00001*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0190*	*0.0018*	*0.0018*	*0.0040*	*0.0025*	0.0006	0.0017	0.0037	0.0041
Nickel	mg/L	*0.0056*	*0.0120*	*0.0047*	*0.0045*	*0.0044*	0.0031	0.0043	0.0053	0.005
Selenium	mg/L	*0.001*	*0.001*	*0.002*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0010*	*0.0008*	*0.0005*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.001*	*0.003*	*0.001*	*0.001*	*0.002*	0.002	< 0.001	0.001	0.002

Table 8-36 Meadowbank 2020 Waste Extension Pool WEP2 Water Quality Monitoring (ST-31)

ST-31	Sample date	*Annual Average*					6/11/2020	7/6/2020	8/4/2020	9/8/2020
Parameter	**Unit**	***2016***	***2017***	***2018***	***2019***	***2020***				
Field Measured										
pH	pH units	*7.56*	*7.66*	*7.30*	*7.34*	*7.67*	7.24	7.45	8.00	7.97
Turbidity	NTU	*17.32*	*12.94*	*18.24*	*7.94*	*4.17*	9.62	2.83	2.20	2.03
Conventional Parameters										
Hardness	mg CaCO3/L	*135*	*96*	*72*	*115*	*101*	18	108	150	126
Total alkalinity, as CaCO3	mg CaCO3/L	*113*	*79*	*52*	*50*	*75*	18	85	104	94
TSS	mg/L	*5*	*10*	*79*	*5*	*3*	4	2	2	3
TDS	mg/L	*181*	*212*	*112*	*125*	*142*	47	133	182	204
Major Ions										
Chloride	mg/L	*5.5*	*12.2*	*5.6*	*2.9*	*3.2*	0.9	5.2	2.7	3.9
Fluoride	mg/L	*0.30*	*0.15*	*0.13*	*0.11*	*0.13*	0.03	0.14	0.19	0.15
Sulphate	mg/L	*32.2*	*41.7*	*30.9*	*39.0*	*31.5*	4.0	24.3	44.6	52.9
Cyanide (free)	mg/L	*0.005*	*0.012*	*0.005*	*0.001*	*0.001*	< 0.001	< 0.001	0.002	0.001
Cyanide	mg/L	*0.004*	*0.002*	*0.002*	*0.001*	*0.001*	< 0.001	< 0.001	0.002	< 0.001
Nutrients and Chlorophyll a										
Total ammonia as NH4	mg N/L	*0.09*	*1.82*	*0.04*	*0.06*	*0.05*	0.07	0.04	0.04	0.03
Un-Ionized Ammonia, calculated	mg NH3/L	*0.01*	*0.03*	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg N/L	*0.55*	*3.09*	*0.34*	*1.12*	*1.04*	0.34	0.44	0.63	2.75
Nitrite	mg N/L	*0.01*	*0.19*	*0.15*	*0.02*	*0.02*	0.04	0.01	0.02	< 0.01
Total Metals										
Aluminum	mg/L	*0.28*	*0.19*	*1.26*	*0.07*	*0.09*	0.23	0.04	0.03	0.05
Arsenic	mg/L	*0.001*	*0.005*	*0.002*	*0.044*	*0.020*	0.003	0.059	0.013	0.003
Barium	mg/L	*0.016*	*0.010*	*0.018*	*0.008*	*0.011*	0.003	0.012	0.015	0.015
Cadmium	mg/L	*0.00004*	*0.00002*	*0.00002*	*0.00002*	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.002*	*0.003*	*0.006*	*0.002*	*0.001*	0.003	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.004*	*0.002*	*0.005*	*0.002*	*0.003*	0.001	0.002	0.009	0.001
Iron	mg/L	*0.820*	*0.630*	*2.738*	*0.337*	*0.343*	0.360	0.250	0.580	0.180
Lead	mg/L	*0.0003*	*0.0022*	*0.0003*	*0.0003*	*0.0003*	< 0.0003	< 0.0003	< 0.0003	< 0.00017

ST-31	Sample date	*Annual Average*					6/11/2020	7/6/2020	8/4/2020	9/8/2020
Parameter	**Unit**	***2016***	***2017***	***2018***	***2019***	***2020***				
Manganese	mg/L	*0.120*	*0.150*	*0.125*	*0.051*	*0.095*	0.067	0.136	0.119	0.057
Mercury	mg/L	*0.00001*	*0.00003*	*0.00001*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	0.000
Molybdenum	mg/L	*0.001*	*0.001*	*0.001*	*0.007*	*0.005*	< 0.0005	0.011	0.005	0.002
Nickel	mg/L	*0.006*	*0.004*	*0.009*	*0.003*	*0.003*	0.002	0.004	0.004	0.003
Selenium	mg/L	*0.001*	*0.001*	*0.003*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0011*	*0.0008*	*0.0005*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.001*	*0.002*	*0.054*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001

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 (27,093 m^3 in 2020). 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 8-39 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 8-37 below provide 2016 – 2020 pumped volume from ST-32.

Table 8-37 Meadowbank 2016 -2020 Volume of Water Pumped from Saddle Dam 3 (ST-32)

Years	ST-32 pumped volume (m^3)
2016	22,095
2017	16,061
2018	21,962
2019	28,198
2020	27,093

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 (15,457 m^3 in 2020). 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 8-40) 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 previously mentioned, water was pumped back to the North Cell TSF as a mitigation measure. Inspections continue to be held at this location on a weekly basis to ensure conformity. Table 8-38 below provide 2015 – 2020 pumped volume from ST-S-2.

Table 8-38 Meadowbank 2015 - 2020 Volume of Water Pumped from Saddle Dam 1 (ST-S-2)

Years	ST-S-2 pumped volume (m^3)
2015	7,185
2016	15,960
2017	13,102
2018	3,626
2019	7,050
2020	15,457

Table 8-39 Meadowbank 2020 Saddle Dam 3 Water Quality Monitoring (ST-32)

ST-32	Sample date	*Annual Average*					6/11/2020	7/6/2020	8/5/2020	9/9/2020
Parameter	**Unit**	***2016***	***2017***	***2018***	***2019***	***2020***				
Field Measured										
pH	pH units	*6.84*	*7.57*	*7.45*	*7.51*	*7.89*	7.64	8.12	8.09	7.72
Turbidity	NTU	*32.03*	*104.55*	*97.98*	*11.02*	*17.72*	52.60	4.54	2.72	11.00
Conventional Parameters										
Hardness	mg CaCO3/L	*253*	*357*	*195*	*262*	*209*	71	240	256	267
Total alkalinity. as CaCO3	mg CaCO3/L	*46*	*121*	*266*	*46*	*73*	34	72	88	99
TSS	mg/L	*399*	*504*	*335*	*406*	*6*	12	3	5	4
TDS	mg/L	*14*	*665*	*56*	*19*	*301*	132	312	398	360
Major Ions										
Chloride	mg/L	*20.3*	*16.2*	*14.7*	*25.6*	*13.5*	1.6	14.5	19.0	18.8
Fluoride	mg/L	*0.35*	*0.38*	*0.32*	*0.31*	*0.24*	0.06	0.17	0.36	0.36
Sulphate	mg/L	*185*	*185*	*117*	*136*	*110*	42	114	162	123
Cyanide	mg/L	*0.010*	*0.049*	*0.016*	*0.008*	*0.004*	0.010	0.004	0.001	0.002
Nutrients and Chlorophyll a										
Total ammonia as NH4	mg N/L	*1.40*	*4.34*	*6.79*	*2.30*	*0.24*	0.19	0.12	0.03	0.60
Un-Ionized Ammonia. calculated	mg NH3/L	*0.01*	*0.04*	*0.13*	*0.05*	*0.01*	< 0.01	< 0.01	< 0.01	0.01
Nitrate	mg N/L	*8.83*	*16.53*	*23.23*	*16.64*	*9.45*	1.06	6.12	14.80	15.80
Nitrite	mg N/L	*0.07*	*0.35*	*0.17*	*0.08*	*0.07*	0.06	0.08	0.10	0.05
Total Metals										
Aluminum	mg/L	*0.245*	*11.010*	*1.456*	*0.494*	*0.137*	0.278	0.029	0.032	0.210
Arsenic	mg/L	*0.001*	*0.008*	*0.007*	*0.039*	*0.043*	0.009	0.063	0.054	0.044
Barium	mg/L	*0.041*	*0.220*	*0.050*	*0.051*	*0.032*	0.009	0.035	0.031	0.052
Cadmium	mg/L	*0.00005*	*0.00013*	*0.00005*	*0.00005*	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.0049*	*0.0500*	*0.0140*	*0.0087*	*0.0019*	0.0050	< 0.0006	< 0.0006	0.0015
Copper	mg/L	*0.0140*	*0.0830*	*0.0132*	*0.0058*	*0.0035*	0.0044	0.0031	0.0024	0.0042
Iron	mg/L	*2.280*	*22.380*	*2.685*	*0.863*	*0.275*	0.670	0.060	0.060	0.310
Lead	mg/L	*0.0078*	*0.0150*	*0.0054*	*0.0003*	*0.0002*	< 0.0003	< 0.0003	< 0.00017	< 0.00017
Manganese	mg/L	*1.410*	*2.880*	*0.444*	*0.291*	*0.088*	0.080	0.092	0.089	0.090
Mercury	mg/L	*0.00001*	*0.00005*	*0.00001*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0027*	*0.0037*	*0.0063*	*0.0108*	*0.0078*	0.0030	0.0141	0.0065	0.0076
Nickel	mg/L	*0.210*	*0.180*	*0.051*	*0.067*	*0.031*	0.008	0.034	0.036	0.046
Selenium	mg/L	*0.001*	*0.003*	*0.001*	*0.003*	*0.001*	< 0.001	< 0.001	0.001	0.002
Silver	mg/L	*0.0001*	*0.0004*	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0008*	*0.0008*	*0.0005*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.005*	*0.073*	*0.007*	*0.002*	*0.036*	0.002	0.140	< 0.001	< 0.001

Table 8-40 Meadowbank 2020 Saddle Dam 1 Water Quality Monitoring (ST-S-2)

ST-S-2	Sample date	*Annual Average*								06/11/2020	07/06/2020	08/04/2020	09/29/2020
Parameter	**Unit**	***2013***	***2014***	***2015***	***2016***	***2017***	***2018***	***2019***	***2020***				
Field Measured													
pH	pH units	*7.04*	*7.31*	*6.64*	*7.47*	*7.92*	*7.60*	*7.04*	*7.93*	7.81	7.97	8.29	7.65
Turbidity	NTU	*27.31*	*26.91*	*45.78*	*22.12*	*21.05*	*27.90*	*21.03*	*7.33*	9.62	13.00	2.08	4.63
Conventional Parameters													
Hardness	mg CaCO3/L	*228*	*199*	*175*	*179*	*215*	*191*	*483*	*311*	46	332	405	460
Total alkalinity, as CaCO3	mg CaCO3/L	*72*	*66*	*51*	*63*	*69*	*50*	*33*	*60*	24	47	63	107
TSS	mg/L	-	-	-	*43*	*9*	*5*	*111*	*4*	5	5	4	1
TDS	mg/L	-	-	-	*304*	*302*	*282*	*450*	*376*	88	351	460	605
Major Ions													
Chloride	mg/L	*55.18*	*27.34*	*7.23*	*6.88*	*5.40*	*5.67*	*11.30*	*6.20*	1.90	6.60	7.40	8.90
Fluoride	mg/L	*0.30*	*0.26*	*0.21*	*0.20*	*0.21*	*0.22*	*0.15*	*0.18*	0.03	0.19	0.26	0.24
Sulphate	mg/L	*311*	*172*	*119*	*180*	*110*	*164*	*299*	*217*	25	235	279	329
Cyanide	mg/L	-	-	-	*0.013*	*0.009*	*0.014*	*0.016*	*0.003*	0.006	0.004	0.001	0.001
Nutrients and Chlorophyll a													
Total ammonia as NH4	mg N/L	*0.05*	*0.04*	*1.51*	*0.13*	*0.10*	*0.14*	*0.27*	*0.06*	0.06	0.17	< 0.01	< 0.01
Un-Ionized Ammonia, calculated	mg NH3/L	*2.44*	*2.24*	*0.02*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg N/L	*16.80*	*9.88*	*7.50*	*8.20*	*9.72*	*4.72*	*3.34*	*4.11*	0.48	4.01	6.76	5.19
Nitrite	mg N/L	-	-	-	*0.04*	*0.02*	*0.02*	*0.05*	*0.04*	0.05	0.04	0.04	< 0.01
Total Metals													
Aluminum	mg/L	*0.360*	*0.360*	*0.410*	*0.390*	*0.280*	*0.235*	*1.523*	*0.270*	0.917	0.135	0.023	< 0.006
Arsenic	mg/L	*0.1500*	*0.0280*	*0.0073*	*0.0280*	*0.0360*	*0.0167*	*0.0309*	*0.0317*	0.0213	0.0225	0.0621	0.0208
Barium	mg/L	*0.0460*	*0.0200*	*0.0180*	*0.0170*	*0.0160*	*0.0171*	*0.0260*	*0.0216*	0.0114	0.0199	0.0266	0.0284
Cadmium	mg/L	*0.00011*	*0.00006*	*0.00004*	*0.00005*	*0.00003*	*0.00003*	*0.00002*	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.0017*	*0.0025*	*0.0017*	*0.0041*	*0.0046*	*0.0017*	*0.0138*	*0.0024*	0.0078	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.0280*	*0.0100*	*0.0140*	*0.0087*	*0.0035*	*0.0041*	*0.0119*	*0.0032*	0.0046	0.0031	0.0021	0.0029
Iron	mg/L	*0.72*	*0.64*	*1.15*	*1.44*	*0.52*	*0.50*	*3.94*	*0.46*	1.40	0.32	0.09	0.03
Lead	mg/L	*0.0023*	*0.0003*	*0.0003*	*0.0092*	*0.0015*	*0.0007*	*0.0054*	*0.0003*	< 0.0003	< 0.0003	< 0.0003	< 0.00017
Manganese	mg/L	*0.420*	*0.240*	*0.330*	*0.280*	*0.081*	*0.251*	*0.296*	*0.110*	0.063	0.187	0.035	0.155

ST-S-2	Sample date	*Annual Average*								06/11/2020	07/06/2020	08/04/2020	09/29/2020
Parameter	**Unit**	***2013***	***2014***	***2015***	***2016***	***2017***	***2018***	***2019***	***2020***				
Mercury	mg/L	*0.00001*	*0.00001*	*0.00001*	*0.00039*	*0.00024*	*0.00013*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0640*	*0.0200*	*0.0140*	*0.0120*	*0.0110*	*0.0096*	*0.0095*	*0.0080*	0.0021	0.0097	0.0146	0.0056
Nickel	mg/L	*0.1300*	*0.0270*	*0.0260*	*0.0310*	*0.0250*	*0.0325*	*0.0547*	*0.0291*	0.0091	0.0247	0.0251	0.0575
Selenium	mg/L	*0.003*	*0.002*	*0.003*	*0.001*	*0.001*	*0.001*	*0.003*	*0.001*	< 0.001	0.001	0.002	< 0.001
Silver	mg/L	*0.0004*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0050*	*0.0050*	*0.0050*	*0.0011*	*0.0008*	*0.0006*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.079*	*0.003*	*0.026*	*0.250*	*0.003*	*0.056*	*0.077*	*0.002*	0.005	< 0.001	< 0.001	< 0.001

8.5.3.1.18 Central Dike Seepage (ST-S-5)

Sampling was conducted at a minimum on a 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 or the Portage Pit. Sample results are presented in Table 8-42. See Figure 1 for the location of ST-S-5. A total of 704,020 m^3 of water was pumped in 2020 from this sump. In 2020, the water was transferred from the Central Dike Seepage Sump to the South Cell TSF in January and February then to Portage Pit E from February to June and to Portage Pit A from August to December. The volume of seepage in 2020 was greatly reduced in comparison to previous years as the seepage was pumped to the Portage Pit for most of the year rather than the South Cell TSF where the seepage would eventually flow back to the dike in a closed loop. Refer to Section 8.5.8.1.2 for details on the Central Dike seepage regarding consequence and mitigation measure in place. Table 8-41 below provide 2015 – 2020 pumped volume from ST-S-5.

Table 8-41 Meadowbank 2015 -2020 Volume of Water Pumped from Central Dike Seepage (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
2019	2,123,002
2020	704,020

8.5.3.1.19 Phaser Pit Sump (ST-41)

The Phaser Pit Sump (ST-41) was constructed during 2018 operation to manage the water runoff from the pit. Monthly samples were conducted in June, July and September, during open, water season as per the requirements of the NWB Water License. Due to the natural reflooding of the pit, Agnico now considers this as Phaser Pit Lake (ST-41 Lake) which was sampled in August. There are no applicable license limits. The data is presented in Table 8-43. Sampling station ST-41/ST-41 Lake is illustrated on Figure 3. No water was transferred to Phaser Attenuation Pond in 2020. All water was kept in the pit to promote the natural reflooding.

8.5.3.1.20 BB Phaser Pit Sump (ST-42)

The BB Phaser Pit Sump was constructed during 2018 operation to manage the water runoff from the pit. Monthly samples has been conducted in June, July and August, during open water season, as per the requirements of the NWB water license. Due to the natural reflooding of the pit, Agnico considers this as BB Phaser Pit Lake (ST-42 Lake) which was sampled in September and October. There are no applicable license limits. The data is presented in Table 8-44. Sampling station ST-42/ST-42 Lake is illustrated on Figure 3. No water was transferred to Phaser Attenuation Pond in 2020. All water was kept in the pit to promote the natural reflooding.

8.5.3.1.21 Phaser Attenuation Pond (ST-43)

During 2020, no water from Phaser et BB Phaser Pit Sumps was pumped and transferred to Phaser Attenuation Pond (ST-43). Water accumulated in Phaser Attenuation pond used to be transferred to the Vault Attenuation pond. In 2020, no water transferred. All water was kept in the pond to promote the natural reflooding. 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 8-45. Sampling station ST-43 is illustrated on Figure 3.

Table 8-42 Meadowbank 2020 Central Dike Seepage Water Quality Monitoring (ST-S-5)

ST-S-5	Sample date	*Annual Average*						1/6/2020	1/13/2020	1/20/2020	1/27/2020	2/4/2020	2/11/2020	2/17/2020	2/24/2020	3/2/2020	3/9/2020	3/17/2020	3/29/2020	4/6/2020	4/20/2020	5/4/2020	5/18/2020
Parameter	**Unit**	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*																
Field Measured																							
pH	pH units	*7.37*	*7.71*	*7.52*	*7.56*	*7.60*	*7.61*	7.65	7.21	7.56	7.61	7.36	7.51	7.68	7.50	7.49	7.56	7.80	7.59	7.51	7.37	7.58	7.69
Turbidity	NTU	*10.21*	*10.33*	*11.89*	*17.27*	*19.36*	*13.36*	-	11.50	13.20	12.40	13.70	12.70	12.10	10.50	9.97	11.70	10.50	17.70	14.70	16.90	16.50	16.80
Conventional Parameters																							
Hardness	mg CaCO3/L	*1140*	*1176*	*1126*	*1094*	*1038*	*987*	1186	1128	936	951	973	955	1091	989	1100	1088	1093	881	1111	1163	1022	1032
Total alkalinity. as CaCO3	mg CaCO3/L	*180*	*145*	*125*	*116*	*89*	*118*	87	120	123	123	122	129	112	136	140	140	139	100	112	107	100	92
TSS	mg/L	*6*	*6*	*5*	*8*	*9*	*6*	11	6	7	5	7	5	6	7	3	5	7	4	5	7	5	5
TDS	mg/L	*2240*	*2582*	*2753*	*2376*	*2174*	*2160*	2573	2336	2210	2241	2308	2227	2340	2265	2279	2515	2549	2839	2843	2753	2985	2849
Major Ions																							
Chloride	mg/L	*498.1*	*451.2*	*379.4*	*459.6*	*334.6*	*286.3*	347.0	348.2	369.9	352.0	347.5	370.1	374.9	382.4	380.2	389.7	390.4	400.0	379.1	386.5	369.9	394.7
Fluoride	mg/L	*0.69*	*0.53*	*0.48*	*0.55*	*0.51*	*0.51*	0.06	0.62	0.54	0.58	0.55	0.59	0.61	0.77	0.59	0.56	0.55	0.58	0.55	0.57	0.56	0.52
Sulphate	mg/L	*1449*	*1806*	*1714*	*2019*	*1716*	*1529*	1700	1670	1630	1870	1710	1720	1600	1720	1790	1770	1770	1910	1770	1720	1740	1770
Cyanide	mg/L	*0.300*	*0.310*	*0.200*	*0.140*	*0.057*	*0.058*	0.062	0.069	0.065	0.074	0.055	0.070	0.057	0.055	0.056	0.056	0.056	0.053	0.060	0.072	0.108	0.110
Nutrients and Chlorophyll a																							
Total ammonia as NH4	mg N/L	*17.89*	*27.32*	*29.83*	*31.49*	*25.14*	*26.28*	23.85	24.89	25.02	21.97	25.47	26.35	25.63	24.93	22.37	23.42	25.37	32.29	36.20	26.69	29.90	32.94
Un-Ionized Ammonia. calculated	mg NH3/L	*0.27*	*0.39*	*0.38*	*0.39*	*0.31*	*0.29*	0.28	0.26	-	0.23	0.26	0.24	0.21	0.18	0.18	0.17	0.22	0.23	0.32	0.21	0.28	0.30
Nitrate	mg N/L	*2.79*	*0.60*	*0.10*	*0.07*	*0.37*	*0.14*	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.09	< 0.01	0.14	< 0.01	< 0.01	< 0.01	< 0.01
Nitrite	mg N/L	*0.06*	*0.06*	*0.02*	*0.02*	*0.07*	*0.05*	0.02	0.01	< 0.01	< 0.01	0.20	0.22	< 0.01	0.02	< 0.01	0.01	0.01	0.26	< 0.01	0.19	0.01	0.01
Total Metals																							
Aluminum	mg/L	*0.2200*	*0.0220*	*0.0150*	*0.0075*	*0.0218*	*0.0378*	< 0.006	0.111	< 0.006	0.006	< 0.006	< 0.006	0.011	0.007	0.007	< 0.006	< 0.006	0.01	< 0.006	0.03	< 0.006	< 0.006
Arsenic	mg/L	*0.0210*	*0.0450*	*0.0550*	*0.0420*	*0.0587*	*0.0533*	0.0533	0.062	0.0398	0.0421	0.0447	0.0449	0.0411	0.0375	0.0444	0.0429	0.0364	0.0446	0.051	0.0545	0.0483	0.0508
Barium	mg/L	*0.0340*	*0.0320*	*0.0240*	*0.0245*	*0.0231*	*0.0226*	0.0242	0.0227	0.0203	0.0194	0.026	0.0225	0.0245	0.0248	0.029	0.0265	0.0247	0.0187	0.027	0.0234	0.0214	0.023
Cadmium	mg/L	*0.0004*	*0.0008*	*0.0008*	*0.0009*	*0.0002*	*0.0001*	0.00042	0.00054	0.00017	0.00027	0.00025	0.00021	0.00042	< 0.00002	< 0.0000200	0.00005	< 0.00002	0.00005	< 0.00002	< 0.00002	< 0.00002	0.00011
Chromium	mg/L	*0.0025*	*0.0016*	*0.0012*	*0.0009*	*0.0011*	*0.0012*	0.0026	0.0017	0.0017	< 0.0006	0.0017	< 0.0006	0.001	< 0.0006	< 0.0006	0.0018	< 0.0006	< 0.0006	< 0.0006	0.0013	0.0011	0.0007
Copper	mg/L	*0.0700*	*0.0540*	*0.0054*	*0.0046*	*0.0307*	*0.0017*	0.0103	0.0095	0.0036	0.0033	0.005	0.0025	0.0051	0.0007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0016	0.0006	0.0005
Iron	mg/L	*1.6*	*2.1*	*1.8*	*1.7*	*2.1*	*1.6*	1.7	1.8	1.2	1.4	1.3	1.2	1.4	1.5	1.6	1.6	1.3	1.6	1.6	2.1	1.6	1.6
Lead	mg/L	*0.0009*	*0.0008*	*0.0028*	*0.0003*	*0.0004*	*0.0005*	< 0.0003	0.0017	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	*2.80*	*2.20*	*2.19*	*2.20*	*2.02*	*2.01*	2.34	2.23	2.48	1.93	2.34	2.07	2.28	1.94	2.26	2.41	2.10	2.51	2.28	2.21	1.89	1.88
Mercury	mg/L	*0.00003*	*0.00009*	*0.00001*	*0.00006*	*0.00002*	*0.00001*	< 0.0000100	<0.00001	0.00001	< 0.0000100	< 0.0000100	< 0.00001	< 0.00001	< 0.00001	< 0.0000100	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00002	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.180*	*0.300*	*0.300*	*0.290*	*0.230*	*0.191*	0.251	0.227	0.255	0.204	0.254	0.221	0.258	0.241	0.275	0.244	0.227	0.182	0.243	0.225	0.210	0.217
Nickel	mg/L	*0.0980*	*0.0470*	*0.0180*	*0.0231*	*0.0343*	*0.0108*	0.0230	0.0213	0.0114	0.0118	0.0130	0.0100	0.0285	0.0097	0.0099	0.0122	0.0085	0.0080	0.0094	0.0093	0.0064	0.0060
Selenium	mg/L	*0.0260*	*0.0340*	*0.0140*	*0.0110*	*0.0024*	*0.0012*	0.0040	0.0030	< 0.001	0.0010	< 0.001	< 0.001	0.0040	0.0020	0.0020	< 0.001	< 0.001	< 0.001	0.0020	< 0.001	< 0.001	0.0020
Silver	mg/L	*0.0001*	*0.0002*	*0.0001*	*0.0001*	*0.0002*	*0.0001*	< 0.0001	<0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0050*	*0.0017*	*0.0008*	*0.0005*	*0.0004*	*0.0003*	< 0.0008	< 0.0008	< 0.0008	< 0.0002	0.0019	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.003*	*0.006*	*0.003*	*0.002*	*0.008*	*0.004*	0.003	0.007	0.003	0.012	0.003	0.006	0.006	0.003	0.002	0.002	< 0.001	< 0.001	< 0.001	0.002	< 0.001	0.002
Dissolved Metals																							
Aluminum	mg/L	*0.006*	*0.006*	*0.006*	*0.006*	*0.002*	*0.006*	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006
Arsenic	mg/L	*0.0220*	*0.0220*	*0.0140*	*0.0136*	*0.0128*	*0.0102*	0.0100	0.0126	0.0081	0.0077	0.0071	0.0134	0.0051	0.0028	0.0036	0.0034	0.0033	0.0026	0.0063	0.0062	0.0068	0.0063
Barium	mg/L	*-*	*-*	*0.021*	*0.025*	*0.020*	*0.021*	0.0222	0.025	0.021	0.0145	0.0258	0.0231	0.0251	0.0214	0.0272	0.0252	0.0212	0.0195	0.0248	0.0221	0.0232	0.0208
Cadmium	mg/L	*0.00051*	*0.00075*	*0.00075*	*0.00094*	*0.00015*	*0.00007*	0.00020	0.00044	0.00015	0.00025	0.00034	0.00018	0.00046	< 0.00002	< 0.0000200	0.00006	0.00004	0.00005	0.00014	0.00002	< 0.00002	0.00004
Chromium	mg/L	*0.0014*	*0.0016*	*0.0007*	*0.0010*	*0.0006*	*0.0007*	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.0056*	*0.0470*	*0.0053*	*0.0055*	*0.0209*	*0.0011*	0.0037	0.0073	0.0024	0.003	0.0048	0.0031	0.0024	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0008	< 0.0005	0.0025	< 0.0005

ST-S-5	Sample date	Annual Average						1/6/2020	1/13/2020	1/20/2020	1/27/2020	2/4/2020	2/11/2020	2/17/2020	2/24/2020	3/2/2020	3/9/2020	3/17/2020	3/29/2020	4/6/2020	4/20/2020	5/4/2020	5/18/2020
Parameter	Unit	2015	2016	2017	2018	2019	2020																
Iron	mg/L	0.06	0.17	0.06	0.20	0.06	0.04	0.07	0.1	< 0.01	0.1	0.04	0.04	0.07	0.03	0.03	0.02	0.04	0.02	0.02	0.02	0.02	0.02
Lead	mg/L	0.0006	0.0007	0.0037	0.0003	0.0003	0.0003	< 0.0003	<0.0005	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	2.55	2.18	2.14	2.27	1.97	1.85	2.04	1.85	2.04	1.81	2.34	1.97	2.06	2.02	2.19	2.19	1.87	2.06	2.15	2.25	1.94	1.94
Mercury	mg/L	0.00004	0.00007	0.00010	0.00002	0.00005	0.00001	< 0.0000100	<0.00001	0.00004	< 0.0000100	< 0.0000100	0.00001	< 0.00001	< 0.00001	< 0.0000100	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00005	< 0.00001	< 0.00001
Molybdenum	mg/L	0.210	0.290	0.300	0.298	0.223	0.177	0.220	0.185	0.207	0.189	0.253	0.214	0.230	0.214	0.224	0.228	0.199	0.174	0.240	0.230	0.216	0.219
Nickel	mg/L	0.049	0.061	0.018	0.024	0.033	0.009	0.016	0.020	0.011	0.011	0.015	0.010	0.017	0.010	0.009	0.011	0.008	0.008	0.009	0.008	0.006	0.006
Selenium	mg/L	0.0280	0.0370	0.0180	0.0173	0.0033	0.0015	0.0040	0.0020	< 0.001	0.0040	< 0.001	0.0010	0.0060	< 0.001	< 0.001	0.0020	0.0020	0.0010	0.0020	0.0020	0.0020	0.0020
Silver	mg/L	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	< 0.0001	<0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.0050	0.0017	0.0008	0.0006	0.0004	0.0003	< 0.0008	< 0.0008	< 0.0008	< 0.0002	0.0028	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.001	0.002	0.002	0.001	0.002	0.004	< 0.001	0.002	0.003	0.003	0.005	0.004	0.005	0.001	< 0.001	0.002	< 0.001	< 0.001	0.003	0.001	< 0.001	< 0.001

ST-S-5	Sample date	Annual Average						6/1/2020	6/15/2020	7/7/2020	7/13/2020	7/20/2020	7/27/2020	8/3/2020	8/10/2020	8/17/2020	8/24/2020	8/31/2020	9/7/2020	9/14/2020	9/21/2020	9/28/2020	10/5/2020	10/13/2020
Parameter	Unit	2015	2016	2017	2018	2019	2020																	
Field Measured																								
pH	pH units	7.37	7.71	7.52	7.56	7.60	7.61	7.66	7.82	7.70	7.70	7.67	7.82	7.79	7.93	7.82	7.69	7.72	7.84	7.79	7.66	7.86	7.84	7.93
Turbidity	NTU	10.21	10.33	11.89	17.27	19.36	13.36	19.30	10.20	5.87	7.16	7.00	9.51	16.90	13.80	25.90	23.70	21.50	23.70	-	17.50	16.90	15.40	14.20
Conventional Parameters																								
Hardness	mg CaCO3/L	1140	1176	1126	1094	1038	987	775	658	1107	1368	689	718	1007	972	941	1244	147	1170	1032	996	953	1121	885
Total alkalinity. as CaCO3	mg CaCO3/L	180	145	125	116	89	118	91	74	108	113	88	93	102	102	117	119	55	126	133	132	132	133	139
TSS	mg/L	6	6	5	8	9	6	11	8	4	7	5	4	4	7	10	13	12	8	6	-	12	12	4
TDS	mg/L	2240	2582	2753	2376	2174	2160	2478	2036	2251	2322	1465	1671	1949	1985	2218	2098	171	2078	2050	2131	2078	2079	1677
Major Ions																								
Chloride	mg/L	498.1	451.2	379.4	459.6	334.6	286.3	286.6	232.2	477.4	349.0	158.7	35.8	232.2	232.1	276.2	265.1	1.6	264.1	268.5	238.4	247.5	261.2	269.9
Fluoride	mg/L	0.69	0.53	0.48	0.55	0.51	0.51	0.53	0.38	0.48	0.48	0.38	0.43	0.48	0.46	0.50	0.52	0.12	0.50	0.54	0.54	0.53	0.58	0.51
Sulphate	mg/L	1449	1806	1714	2019	1716	1529	1620	1000	1560	1580	935	1150	1350	2490	1470	1380	69	1650	1450	1490	1320	1420	1400
Cyanide	mg/L	0.300	0.310	0.200	0.140	0.057	0.058	0.075	0.080	0.067	0.067	0.033	0.035	0.071	0.045	0.056	0.057	< 0.001	0.048	0.050	0.048	0.049	0.040	0.055
Nutrients and Chlorophyll a																								
Total ammonia as NH4	mg N/L	17.89	27.32	29.83	31.49	25.14	26.28	30.31	12.61	25.19	21.00	21.26	22.00	26.94	28.29	29.22	27.41	0.02	27.98	26.46	26.26	26.25	27.79	27.82
Un-Ionized Ammonia. calculated	mg NH3/L	0.27	0.39	0.38	0.39	0.31	0.29	0.39	0.13	0.24	0.21	0.36	0.01	0.43	0.53	0.50	0.31	0.01	0.50	0.44	0.46	0.42	0.47	0.41
Nitrate	mg N/L	2.79	0.60	0.10	0.07	0.37	0.14	0.11	0.35	< 0.01	< 0.01	0.37	0.23	< 0.01	0.28	0.12	0.14	0.84	0.23	0.35	0.16	0.18	0.17	0.07
Nitrite	mg N/L	0.06	0.06	0.02	0.02	0.07	0.05	0.02	0.04	0.02	0.03	0.04	0.04	0.03	0.03	0.03	0.05	0.01	0.06	0.06	0.06	0.04	0.04	0.05
Total Metals																								
Aluminum	mg/L	0.2200	0.0220	0.0150	0.0075	0.0218	0.0378	0.146	0.047	< 0.006	< 0.006	0.032	< 0.006	< 0.006	0.028	0.05	0.016	0.901	0.024	0.008	0.054	< 0.006	0.016	< 0.005
Arsenic	mg/L	0.0210	0.0450	0.0550	0.0420	0.0587	0.0533	0.0271	0.0578	0.0876	0.1182	0.0466	0.041	0.068	0.057	0.075	0.096	0.012	0.098	0.080	0.078	0.061	0.063	0.049
Barium	mg/L	0.0340	0.0320	0.0240	0.0245	0.0231	0.0226	0.0183	0.0158	0.0195	0.0291	0.0199	0.023	0.028	< 0.0005	0.024	0.022	0.023	0.029	0.022	0.026	0.022	0.025	0.024
Cadmium	mg/L	0.0004	0.0008	0.0008	0.0009	0.0002	0.0001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00007	< 0.00002	< 0.0000200	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.0029	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.0025	0.0016	0.0012	0.0009	0.0011	0.0012	0.0017	0.0007	< 0.0006	< 0.0006	0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.0067	< 0.0006	0.0015	0.0045	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.0700	0.0540	0.0054	0.0046	0.0307	0.0017	0.0007	0.0009	0.0011	< 0.0005	0.0013	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0051	0.0012	< 0.0005	0.0057	< 0.0005	< 0.0005	0.0005
Iron	mg/L	1.6	2.1	1.8	1.7	2.1	1.6	1.1	1.8	3	3.9	1.2	0.9	1.6	1.4	2.4	2.6	1.6	2.4	2.4	1.8	1.4	1.6	1.2
Lead	mg/L	0.0009	0.0008	0.0028	0.0003	0.0004	0.0005	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.00017	0.0003	< 0.00017	0.0091	< 0.00017	< 0.00017	0.0008	< 0.00017	< 0.00017	0.0006
Manganese	mg/L	2.80	2.20	2.19	2.20	2.02	2.01	1.85	1.25	1.93	2.63	1.20	1.35	1.81	2.00	1.92	2.27	0.07	2.45	2.05	2.02	2.00	2.39	2.10
Mercury	mg/L	0.00003	0.00009	0.00001	0.00006	0.00002	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.0000100	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.180	0.300	0.300	0.290	0.230	0.191	0.205	0.140	0.178	0.257	0.122	0.130	0.169	0.163	0.168	0.197	0.003	0.205	0.178	0.180	0.183	0.182	0.154

ST-S-5	Sample date	Annual Average						6/1/2020	6/15/2020	7/7/2020	7/13/2020	7/20/2020	7/27/2020	8/3/2020	8/10/2020	8/17/2020	8/24/2020	8/31/2020	9/7/2020	9/14/2020	9/21/2020	9/28/2020	10/5/2020	10/13/2020
Parameter	**Unit**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**																	
Nickel	mg/L	0.0980	0.0470	0.0180	0.0231	0.0343	0.0108	0.0063	0.0124	0.0081	0.0077	0.0164	0.0143	0.0144	0.0169	0.0095	0.0117	0.0117	0.0149	0.0076	0.0119	0.0100	0.0119	0.0113
Selenium	mg/L	0.0260	0.0340	0.0140	0.0110	0.0024	0.0012	< 0.001	0.0010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0020	0.0010	< 0.001	< 0.001	< 0.001	0.0020	< 0.001	< 0.0005	< 0.0005
Silver	mg/L	0.0001	0.0002	0.0001	0.0001	0.0002	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0003	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.0050	0.0017	0.0008	0.0005	0.0004	0.0003	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0005	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.003	0.006	0.003	0.002	0.008	0.004	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	0.009	0.002	0.004	0.004	0.004	0.007	< 0.001	< 0.001	0.002
Dissolved Metals																								
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.002	0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	0.006	< 0.005
Arsenic	mg/L	0.0220	0.0220	0.0140	0.0136	0.0128	0.0102	0.0056	0.0141	0.0454	0.0577	0.0109	0.0087	0.0104	0.0096	0.0113	0.0095	0.0024	0.0102	0.011	0.0135	0.0086	0.0092	0.0095
Barium	mg/L	-	-	0.021	0.025	0.020	0.021	0.0224	0.0121	0.0207	0.0201	0.0205	0.0198	0.022	0.0017	0.0222	0.0216	0.0169	0.0259	0.0214	0.0225	0.0197	0.0175	0.0202
Cadmium	mg/L	0.00051	0.00075	0.00075	0.00094	0.00015	0.00007	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0000200	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.0014	0.0016	0.0007	0.0010	0.0006	0.0007	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.0056	0.0470	0.0053	0.0055	0.0209	0.0011	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Iron	mg/L	0.06	0.17	0.06	0.20	0.06	0.04	< 0.01	0.02	0.04	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Lead	mg/L	0.0006	0.0007	0.0037	0.0003	0.0003	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017
Manganese	mg/L	2.55	2.18	2.14	2.27	1.97	1.85	1.65	1.02	2.11	2.11	1.19	1.23	1.51	1.32	1.96	1.90	0.02	2.12	1.85	2.10	1.71	1.76	1.84
Mercury	mg/L	0.00004	0.00007	0.00010	0.00002	0.00005	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.0000100	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.210	0.290	0.300	0.298	0.223	0.177	0.193	0.113	0.190	0.193	0.123	0.120	0.140	0.125	0.168	0.175	< 0.0005	0.177	0.172	0.187	0.156	0.147	0.152
Nickel	mg/L	0.049	0.061	0.018	0.024	0.033	0.009	0.005	0.010	0.010	0.006	0.017	0.012	0.012	0.012	0.010	0.009	0.003	0.012	0.006	0.009	0.007	0.009	0.012
Selenium	mg/L	0.0280	0.0370	0.0180	0.0173	0.0033	0.0015	0.0010	0.0010	< 0.001	< 0.001	0.0010	0.0020	0.0010	< 0.001	0.0030	< 0.001	< 0.001	< 0.001	< 0.001	0.0010	< 0.001	< 0.0005	0.0028
Silver	mg/L	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.0050	0.0017	0.0008	0.0006	0.0004	0.0003	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.001	0.002	0.002	0.001	0.002	0.004	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.015	0.005	< 0.001	0.005	< 0.001	0.005	< 0.001	< 0.001	< 0.001

ST-S-5	Sample date	Annual Average						10/19/2020	10/27/2020	11/4/2020	11/9/2020	11/16/2020	11/23/2020	12/1/2020	12/7/2020	12/14/2020	12/21/2020	12/28/2020
Parameter	**Unit**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**											
Field Measured																		
pH	pH units	7.37	7.71	7.52	7.56	7.60	7.61	7.63	7.74	7.40	7.43	7.23	7.46	7.34	7.53	7.25	7.43	7.28
Turbidity	NTU	10.21	10.33	11.89	17.27	19.36	13.36	16.10	11.90	11.60	9.73	8.64	8.06	6.99	7.67	10.90	9.99	10.00
Conventional Parameters																		
Hardness	mg CaCO3/L	1140	1176	1126	1094	1038	987	1095	1273	1024	1015	891	874	990	899	969	1028	896
Total alkalinity. as CaCO3	mg CaCO3/L	180	145	125	116	89	118	137	148	139	143	130	130	130	130	149	99	128
TSS	mg/L	6	6	5	8	9	6	10	9	7	1	2	2	3	4	4	3	1
TDS	mg/L	2240	2582	2753	2376	2174	2160	128	125	2050	2112	2680	2620	2700	2540	2105	2511	2620
Major Ions																		
Chloride	mg/L	498.1	451.2	379.4	459.6	334.6	286.3	264.3	180.0	180.0	190.0	200.0	240.0	220.0	220.0	276.9	268.1	279.9
Fluoride	mg/L	0.69	0.53	0.48	0.55	0.51	0.51	0.54	0.51	0.52	0.54	0.49	0.59	0.49	0.51	0.56	0.52	0.54
Sulphate	mg/L	1449	1806	1714	2019	1716	1529	1450	1500	1700	1410	1400	1400	1400	1400	1450	1390	1560
Cyanide	mg/L	0.300	0.310	0.200	0.140	0.057	0.058	0.049	0.062	0.059	0.055	0.050	0.045	0.049	0.054	0.069	0.059	0.064
Nutrients and Chlorophyll a																		
Total ammonia as NH4	mg N/L	17.89	27.32	29.83	31.49	25.14	26.28	27.00	29.00	29.00	31.00	32.00	32.00	29.00	29.00	28.50	28.03	27.88
Un-Ionized Ammonia. calculated	mg NH3/L	0.27	0.39	0.38	0.39	0.31	0.29	0.38	0.36	0.20	-	-	-	-	-	0.24	0.10	0.23
Nitrate	mg N/L	2.79	0.60	0.10	0.07	0.37	0.14	0.12	0.19	0.11	0.15	0.21	0.31	0.31	0.21	0.14	0.17	0.07
Nitrite	mg N/L	0.06	0.06	0.02	0.02	0.07	0.05	0.04	0.05	0.03	0.03	0.03	0.03	0.05	0.04	0.02	0.02	0.04

ST-S-5	Sample date	*Annual Average*						10/19/2020	10/27/2020	11/4/2020	11/9/2020	11/16/2020	11/23/2020	12/1/2020	12/7/2020	12/14/2020	12/21/2020	12/28/2020
Parameter	**Unit**	***2015***	***2016***	***2017***	***2018***	***2019***	***2020***											
Total Metals																		
Aluminum	mg/L	*0.2200*	*0.0220*	*0.0150*	*0.0075*	*0.0218*	*0.0378*	< 0.005	0.008	0.006	< 0.005	< 0.0060	< 0.0060	< 0.0060	0.0093	< 0.005	0.011	< 0.005
Arsenic	mg/L	*0.0210*	*0.0450*	*0.0550*	*0.0420*	*0.0587*	*0.0533*	0.064	0.057	0.062	0.043	0.031	0.032	0.034	0.048	0.039	0.044	0.043
Barium	mg/L	*0.0340*	*0.0320*	*0.0240*	*0.0245*	*0.0231*	*0.0226*	0.022	0.026	0.023	0.022	0.022	0.022	0.022	0.022	0.020	0.021	0.023
Cadmium	mg/L	*0.0004*	*0.0008*	*0.0008*	*0.0009*	*0.0002*	*0.0001*	< 0.00002	0.00003	< 0.00002	0.00003	< 0.000020	< 0.000020	< 0.000020	< 0.000020	< 0.00002	0.00011	< 0.00002
Chromium	mg/L	*0.0025*	*0.0016*	*0.0012*	*0.0009*	*0.0011*	*0.0012*	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.0700*	*0.0540*	*0.0054*	*0.0046*	*0.0307*	*0.0017*	0.0014	0.0009	< 0.0005	< 0.0005	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0005	0.0009	< 0.0005
Iron	mg/L	*1.6*	*2.1*	*1.8*	*1.7*	*2.1*	*1.6*	1.7	1.6	1.3	1.1	0.893	0.841	1.01	1.45	1.1	1.2	1.2
Lead	mg/L	*0.0009*	*0.0008*	*0.0028*	*0.0003*	*0.0004*	*0.0005*	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00017	0.0004	< 0.00017
Manganese	mg/L	*2.80*	*2.20*	*2.19*	*2.20*	*2.02*	*2.01*	2.29	2.36	2.11	2.41	1.74	1.74	1.65	1.80	1.89	2.01	2.16
Mercury	mg/L	*0.00003*	*0.00009*	*0.00001*	*0.00006*	*0.00002*	*0.00001*	< 0.00001	< 0.00001	0.00001	< 0.00001	-	-	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.180*	*0.300*	*0.300*	*0.290*	*0.230*	*0.191*	0.177	0.200	0.178	0.172	0.162	0.164	0.168	0.173	0.164	0.155	0.163
Nickel	mg/L	*0.0980*	*0.0470*	*0.0180*	*0.0231*	*0.0343*	*0.0108*	0.0117	0.0087	0.0068	0.0093	0.0065	0.0062	0.0059	0.0063	0.0070	0.0060	0.0053
Selenium	mg/L	*0.0260*	*0.0340*	*0.0140*	*0.0110*	*0.0024*	*0.0012*	0.0015	0.0008	< 0.0005	< 0.0005	0.0008	0.0005	0.0003	-	< 0.0005	0.0005	0.0015
Silver	mg/L	*0.0001*	*0.0002*	*0.0001*	*0.0001*	*0.0002*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	0.0006	< 0.00004	< 0.00004	< 0.00004	< 0.00004	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0050*	*0.0017*	*0.0008*	*0.0005*	*0.0004*	*0.0003*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.003*	*0.006*	*0.003*	*0.002*	*0.008*	*0.004*	0.027	0.003	< 0.001	0.002	< 0.01	< 0.01	< 0.01	< 0.01	< 0.001	< 0.001	0.002
Dissolved Metals																		
Aluminum	mg/L	*0.006*	*0.006*	*0.006*	*0.006*	*0.002*	*0.006*	< 0.005	0.011	< 0.005	< 0.005	< 0.0060	< 0.0060	< 0.0060	< 0.0060	< 0.005	< 0.005	< 0.005
Arsenic	mg/L	*0.0220*	*0.0220*	*0.0140*	*0.0136*	*0.0128*	*0.0102*	0.01	0.0093	0.0101	0.0056	0.00472	0.00918	0.00544	0.0208	0.008	0.0068	0.0069
Barium	mg/L	*-*	*-*	*0.021*	*0.025*	*0.020*	*0.021*	0.0189	0.0238	0.0244	0.0238	0.0203	0.0209	0.0219	0.0214	0.0205	0.0185	0.0235
Cadmium	mg/L	*0.00051*	*0.00075*	*0.00075*	*0.00094*	*0.00015*	*0.00007*	< 0.00002	< 0.00002	< 0.00002	0.00007	< 0.000020	< 0.000020	< 0.000020	< 0.000020	< 0.00002	< 0.00002	0.00002
Chromium	mg/L	*0.0014*	*0.0016*	*0.0007*	*0.0010*	*0.0006*	*0.0007*	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.0056*	*0.0470*	*0.0053*	*0.0055*	*0.0209*	*0.0011*	< 0.0005	0.0006	< 0.0005	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.0005	< 0.0005
Iron	mg/L	*0.06*	*0.17*	*0.06*	*0.20*	*0.06*	*0.04*	< 0.01	0.13	< 0.01	0.02	< 0.01	0.096	0.013	0.739	0.02	0.02	0.02
Lead	mg/L	*0.0006*	*0.0007*	*0.0037*	*0.0003*	*0.0003*	*0.0003*	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00017	< 0.00017	< 0.00017
Manganese	mg/L	*2.55*	*2.18*	*2.14*	*2.27*	*1.97*	*1.85*	1.89	2.25	2.09	2.16	1.65	1.72	1.73	1.68	2.00	1.92	2.04
Mercury	mg/L	*0.00004*	*0.00007*	*0.00010*	*0.00002*	*0.00005*	*0.00001*	< 0.00001	< 0.00001	0.00004	< 0.00001	-	-	-	< 0.00001	0.00003	0.00001	0.00001
Molybdenum	mg/L	*0.210*	*0.290*	*0.300*	*0.298*	*0.223*	*0.177*	0.164	0.196	0.168	0.169	0.152	0.155	0.172	0.168	0.167	0.148	0.164
Nickel	mg/L	*0.049*	*0.061*	*0.018*	*0.024*	*0.033*	*0.009*	0.010	0.008	0.006	0.008	0.006	0.007	0.006	0.006	0.007	0.006	0.007
Selenium	mg/L	*0.0280*	*0.0370*	*0.0180*	*0.0173*	*0.0033*	*0.0015*	0.0018	< 0.0005	0.0007	0.0021	0.0013	0.0008	-	0.0007	0.0018	0.0008	0.0005
Silver	mg/L	*0.0001*	*0.0002*	*0.0001*	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.000040	< 0.000040	< 0.000040	< 0.000040	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0050*	*0.0017*	*0.0008*	*0.0006*	*0.0004*	*0.0003*	< 0.0002	< 0.0002	0.001	< 0.0002	< 0.000020	< 0.000020	< 0.000020	< 0.000020	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.001*	*0.002*	*0.002*	*0.001*	*0.002*	*0.004*	< 0.001	0.032	< 0.001	0.004	< 0.01	< 0.01	< 0.01	< 0.01	< 0.001	0.001	0.001

Table 8-43 Meadowbank 2020 Phaser Pit Sump Water Quality Monitoring (ST-41/ST-41 Lake)

ST-41/ST-41 Lake	Sample date	*Annual Average*			6/29/2020	7/7/2020	8/18/2020	9/8/2020
Parameter	**Unit**	***2018***	***2019***	***2020***				*
Field Measured								
pH	pH units	*7.69*	*7.41*	*7.68*	7.21	7.79	8.05	8.07
Turbidity	NTU	*8.51*	*7.79*	*5.86*	7.84	3.88	-	76.00
Conventional Parameters								
Hardness	mg CaCO3/L	*117*	*109*	*83*	66	73	110	133
Total alkalinity. as CaCO3	mg CaCO3/L	*223*	*39*	*28*	29	30	25	67
TSS	mg/L	*7*	*4*	*4*	6	4	1	3
Total Dissolved Solids	mg/L	*371*	*202*	*102*	89	89	128	154
Major Ions								
Chloride	mg/L	*10.1*	*3.4*	*2.0*	1.1	3.3	1.7	2.4
Fluoride	mg/L	*0.19*	*0.13*	*0.07*	0.04	0.07	0.09	0.12
Sulphate	mg/L	*83.7*	*68.8*	*34.4*	32	30.5	40.7	49.6
Cyanide	mg/L	*0.19*	*0.002*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Nutrients and Chlorophyll a								
Total ammonia as NH4	mg N/L	*12.63*	*2.09*	*0.08*	0.14	0.07	0.02	0.05
Un-Ionized Ammonia. calculated	mg NH3/L	*0.24*	*0.03*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg N/L	*26.18*	*4.11*	*1.89*	1.38	1.43	2.87	3.3
Nitrite	mg N/L	*0.40*	*0.04*	*0.02*	0.02	0.02	< 0.01	0.02
Total Metals								
Aluminum	mg/L	*0.197*	*0.160*	*0.110*	0.188	0.110	0.032	0.045
Arsenic	mg/L	*0.0016*	*0.0027*	*0.0021*	0.0021	0.0015	0.0026	0.0026
Barium	mg/L	*0.0954*	*0.0247*	*0.0117*	0.0082	0.0111	0.0159	0.0245
Cadmium	mg/L	*0.00009*	*0.00006*	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.0012*	*0.0010*	*0.0006*	0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.0110*	*0.0070*	*0.0029*	0.003	0.0032	0.0024	0.0029
Iron	mg/L	*0.52*	*0.30*	*0.19*	0.34	0.21	0.01	0.05
Lead	mg/L	*0.0006*	*0.0003*	*0.0003*	< 0.0003	< 0.0003	< 0.00017	< 0.00017
Manganese	mg/L	*0.0866*	*0.1157*	*0.0579*	0.0904	0.0698	0.0134	0.0216
Mercury	mg/L	*0.00001*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0294*	*0.0136*	*0.0059*	0.0046	0.0041	0.0091	0.0131
Nickel	mg/L	*0.0059*	*0.0084*	*0.0059*	0.0079	0.0072	0.0027	0.0031
Selenium	mg/L	*0.002*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0002*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.003*	*0.005*	*0.016*	0.047	< 0.001	< 0.001	< 0.001
Dissolved Metals								
Aluminum	mg/L	-	-	*0.008*	< 0.006	0.013	< 0.006	0.018
Arsenic	mg/L	-	-	*0.0007*	0.0010	0.0007	< 0.0005	0.0019

ST-41/ST-41 Lake	Sample date	*Annual Average*			6/29/2020	7/7/2020	8/18/2020	9/8/2020
Parameter	**Unit**	***2018***	***2019***	***2020***				*
Barium	mg/L	-	-	*0.0072*	0.0049	0.0083	0.0083	0.0238
Cadmium	mg/L	-	-	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	-	-	*0.0006*	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	-	-	*0.0009*	0.0009	0.0012	< 0.0005	0.0019
Iron	mg/L	-	-	*0.01*	< 0.01	0.02	< 0.01	< 0.01
Lead	mg/L	-	-	*0.0003*	< 0.0003	< 0.0003	< 0.00017	< 0.00017
Manganese	mg/L	-	-	*0.0383*	0.0655	0.0489	< 0.0005	0.0115
Mercury	mg/L	-	-	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	-	-	*0.0025*	0.0036	0.0033	< 0.0005	0.0115
Nickel	mg/L	-	-	*0.0037*	0.0046	0.006	< 0.0005	0.0023
Selenium	mg/L	-	-	*0.001*	< 0.001	< 0.001	< 0.001	0.001
Silver	mg/L	-	-	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	-	-	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	-	-	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001

* Sample ST-41 Lake

Table 8-44 Meadowbank 2020 BB Phaser Pit Sump Water Quality Monitoring (ST-42/ST-42 Lake)

ST-42/ST-42 Lake	Sample date	*Annual Average*			6/29/2020	7/7/2020	8/18/2020	9/8/2020	10/14/2020
Parameter	**Unit**	***2018***	***2019***	***2020***				*	*
Field Measured									
pH	pH units	*7.84*	*7.77*	*7.86*	7.13	8.11	8.08	7.98	7.99
Turbidity	NTU	*2.59*	*11.38*	*4.82*	9.57	6.17	-	2.27	1.28
Conventional Parameters									
Hardness	mg CaCO3/L	*276*	*87*	*63*	42	42	70	72	87
Total alkalinity. as CaCO3	mg CaCO3/L	*77*	*58*	*41*	25	28	42	53	57
TSS	mg/L	*3*	*10*	*4*	5	4	3	5	2
TDS	mg/L	*317*	*133*	*58*	55	59	84	85	7
Major Ions									
Chloride	mg/L	*5.7*	*2.6*	*1.6*	0.8	2.4	1.5	1.3	1.8
Fluoride	mg/L	*0.16*	*0.12*	*0.08*	0.05	0.06	0.07	0.09	0.11
Sulphate	mg/L	*178.3*	*43.2*	*27.9*	17.6	17.5	26.3	29.2	49
Cyanide	mg/L	*0.027*	*0.015*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	0.001
Nutrients and Chlorophyll a									
Total ammonia as NH4	mg N/L	*3.3*	*1.2*	*0.1*	0.1	0.02	0.04	0.07	0.04
Un-Ionized Ammonia. calculated	mg NH3/L	*0.04*	*0.02*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg N/L	*5.48*	*2.04*	*0.81*	0.46	0.44	0.78	0.98	1.37
Nitrite	mg N/L	*0.11*	*0.04*	*0.01*	< 0.01	< 0.01	< 0.01	0.01	< 0.01
Total Metals									
Aluminum	mg/L	*0.09*	*0.32*	*0.12*	0.282	0.14	0.078	0.079	0.041
Arsenic	mg/L	*0.0021*	*0.0034*	*0.0017*	0.0022	0.0011	0.0018	0.0014	0.0022
Barium	mg/L	*0.086*	*0.026*	*0.011*	0.006	0.0096	0.0083	0.015	0.0174
Cadmium	mg/L	*0.00004*	*0.00004*	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.0008*	*0.0010*	*0.0007*	0.0009	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.00907*	*0.00810*	*0.0046*	0.0041	0.0048	0.0041	0.0048	0.005
Iron	mg/L	*0.15*	*0.39*	*0.20*	0.41	0.24	0.11	0.10	0.05
Lead	mg/L	*0.0003*	*0.0003*	*0.0009*	< 0.0003	0.0037	< 0.00017	< 0.00017	< 0.00017
Magnesium	mg/L	*-*	*-*	*3.67*	2.49	2.49	4.03	4.41	4.93
Manganese	mg/L	*0.358*	*0.080*	*0.027*	0.0495	0.041	0.013	0.0225	0.0082
Mercury	mg/L	*0.00001*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.009*	*0.008*	*0.003*	0.0025	0.0013	0.004	0.0037	0.005
Nickel	mg/L	*0.017*	*0.005*	*0.005*	0.0042	0.0048	0.0045	0.0066	0.005
Selenium	mg/L	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	0.001
Silver	mg/L	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0002*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.00933*	*0.00100*	*0.002*	0.003	0.003	0.002	0.001	< 0.001
Dissolved Metals									
Aluminum	mg/L	*0.034*	*0.034*	*0.013*	< 0.006	< 0.006	< 0.006	0.033	< 0.005
Arsenic	mg/L	*0.002*	*0.003*	*0.001*	0.0013	0.0009	< 0.0005	0.001	0.0015
Barium	mg/L	*0.0761*	*0.0202*	*0.0050*	0.0034	0.0059	0.0057	0.0112	0.0136

ST-42/ST-42 Lake	Sample date	*Annual Average*			6/29/2020	7/7/2020	8/18/2020	9/8/2020	10/14/2020
Parameter	**Unit**	***2018***	***2019***	***2020***				*	*
Cadmium	mg/L	*0.00003*	*0.00002*	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0000200
Chromium	mg/L	*0.0012*	*0.0006*	*0.0006*	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.00743*	*0.00565*	*0.0028*	0.0018	0.0023	< 0.0005	0.0032	0.0038
Iron	mg/L	*0.02*	*0.02*	*0.01*	< 0.01	0.01	< 0.01	< 0.01	< 0.01
Lead	mg/L	*0.0005*	*0.0003*	*0.0002*	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017
Manganese	mg/L	*0.3072*	*0.0578*	*0.0130*	0.0341	0.0295	< 0.0005	< 0.0005	< 0.0005
Mercury	mg/L	*0.00001*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.0000100
Molybdenum	mg/L	*0.009*	*0.007*	*0.003*	0.002	0.0018	< 0.0005	0.0033	0.0048
Nickel	mg/L	*0.0141*	*0.0035*	*0.0041*	0.0034	0.0036	< 0.0005	0.0053	0.0041
Selenium	mg/L	*0.0008*	*0.0005*	*0.0009*	< 0.001	< 0.001	< 0.001	0.001	< 0.0005
Silver	mg/L	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0002*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.006*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

* ST-42 Lake samples

Table 8-45 Meadowbank 2020 Phaser Attenuation Pond Water Quality Monitoring (ST-43)

ST-43	Sample date	*Annual Average*			6/29/2020	7/7/2020	8/5/2020	9/9/2020
Parameter	**Unit**	***2018***	***2019***	***2020***				
Field Measured								
pH	pH units	*7.29*	*7.17*	*7.55*	7.08	7.73	8.02	7.37
Turbidity	NTU	*10.10*	*19.91*	*1.98*	2.8	2.37	1.58	1.17
Conventional Parameters								
Hardness	mg CaCO3/L	*254*	*74*	*70*	42	48	96	93
Total alkalinity. as CaCO3	mg CaCO3/L	*16*	*35*	*28*	15	16	30	49
TSS	mg/L	*4*	*13*	*5*	2	2	6	11
Total Dissolved Solids	mg/L	*355*	*122*	*91*	61	65	118	120
Major Ions								
Chloride	mg/L	*5.5*	*2.2*	*1.6*	0.9	1.0	2.2	2.2
Fluoride	mg/L	*0.15*	*0.10*	*0.07*	0.04	0.05	0.08	0.09
Sulphate	mg/L	*287.3*	*65.0*	*45.4*	29.1	28.9	62.8	60.9
Cyanide	mg/L	*0.005*	*0.004*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Nutrients and Chlorophyll a								
Total ammonia as NH4	mg N/L	*3.73*	*1.91*	*0.08*	0.12	0.07	0.07	0.05
Un-Ionized Ammonia. calculated	mg NH3/L	*0.02*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg N/L	*5.55*	*2.56*	*0.95*	0.74	0.77	1.31	0.97
Nitrite	mg N/L	*0.73*	*0.04*	*0.01*	0.01	< 0.01	0.02	< 0.01
Total Metals								
Aluminum	mg/L	*0.52*	*0.71*	*0.06*	0.062	0.074	0.06	0.036
Arsenic	mg/L	*0.0009*	*0.0017*	*0.0007*	< 0.0005	< 0.0005	0.0011	< 0.0005
Barium	mg/L	*0.055*	*0.020*	*0.011*	0.0048	0.008	0.0175	0.0143
Cadmium	mg/L	*0.00122*	*0.00020*	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.0006*	*0.0010*	*0.0009*	< 0.0006	< 0.0006	0.0016	< 0.0006
Copper	mg/L	*0.035*	*0.016*	*0.005*	0.0025	0.004	0.0076	0.0051
Iron	mg/L	*2.65*	*1.34*	*0.34*	0.21	0.37	0.55	0.23
Lead	mg/L	*0.0004*	*0.0003*	*0.0002*	< 0.0003	< 0.0003	< 0.00017	< 0.00017
Manganese	mg/L	*0.6735*	*0.1745*	*0.0581*	0.0845	0.0882	0.0469	0.0128
Mercury	mg/L	*0.00001*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0035*	*0.0047*	*0.0008*	< 0.0005	< 0.0005	0.0014	0.0007
Nickel	mg/L	*0.100*	*0.027*	*0.011*	0.0106	0.0119	0.012	0.0084
Selenium	mg/L	*0.002*	*0.004*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0002*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.103*	*0.026*	*0.004*	< 0.001	0.005	0.008	< 0.001

8.5.3.1.22 Landfarm

Meadowbank's first landfarm (Landfarm 1 – ST-14) was located on the north-west side of the South Tailings Cell (Tailing Storage Facility; TSF) is currently flooded and is now inactive. Landfarm 2 (ST-14b) was constructed in 2016, contaminated soil was added since 2017. In 2020, no ponded water or seepage from the landfarm area was identified, so no water quality sampling was required. It should be noted that if any runoff is observed from the landfarm, the direction of flow is directly towards the adjacent TSF.

8.5.3.1.23 Landfill

No water quality monitoring was completed at the landfill in 2020 as no leachate was observed. The total volume of waste transferred to the landfill in 2020 was 4,480 m^3. A monthly summary of the solid waste disposed at the landfill is presented in Section 6.1.1 Table 6-2 .

8.5.3.2 *Whale Tail Site*

8.5.3.2.1 Whale Tail Attenuation Pond (ST-WT-1)

The Whale Tail Attenuation pond was in operation in 2020 beginning on May 20th, 2020. Water from the Whale Tail Attenuation Pond is treated in the WTP prior to being discharged in either Whale Tail South or Mammoth Lake via the submerged diffusers. Samples from the Whale Tail Attenuation Pond (ST-WT-1) prior to treatment, are to be collected four times per year as per the Water Licence, however Agnico is sampling the pond on a weekly basis for Group 1 parameters. The results for 2020 are presented in Table 8-46 below.

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

In 2020, water was observed in the Whale Tail WRSF pond. As per the Water License, water sample are required to be taken four (4) time per calendar year. In 2020, eighteen (18) water samples were taken and the data is presented in Table 8-47. Agnico has taken weekly samples starting in July 2019 to have a better control of the water management on site. There are no applicable license limits. Sampling station ST-WT-3 is illustrated on Figure 4. A total of 115,632 m^3 was transferred from this pond to the Whale Tail Attenuation Pond in 2020.

Refer to Section 8.5.8.2.4 below for a discussion regarding the water flow through the Whale Tail Waste Rock Storage Facility (WRSF) Dike observed on August 24th, 2019 at the toe of the dike flowing toward Mammoth Lake.

8.5.3.2.3 Whale Tail Pit / Sump (ST-WT-4)

In 2019, with the development of the Whale Tail Pit, Agnico started the water quality monitoring in the pit/sump. As per the Water License, water sample needed to be taken four (4) time per calendar year. In 2020, thirty-five (35) water samples were taken and the data is presented in Table 8-48. Agnico has taken weekly samples, when safe to do and when water is present in the pit, starting in July 2019 to have a better understanding of the water management on site. There are no applicable license limits. Sampling station ST-WT-4 is illustrated on Figure 4. A total of 91,584 m^3 was transferred to Quarry 1 (January to April) and a total of 496,137 m^3 was transferred from this pond to the Whale Tail Attenuation Pond (June to December) in 2020.

8.5.3.2.4 IVR Pit Sump (ST-WT-18)

In 2020, following the dewatering of the Northeast sector, Agnico collected water quality samples in the IVR Pit sump (ST-WT-18) during the development of Phase 1 of the IVR Pit. Water from the IVR Pit was pumped to the Whale Tail Attenuation Pond in August, September, and October. A total of 134,342 m^3 was pumped from the IVR Pit to the Whale Tail Attenuation pond in 2020. Results from samples collected in 2020 are provided in Table 8-49.

8.5.3.2.5 Lake A47 (ST-WT-6)

In 2020, water from the Lake A47 (ST-WT-6) was sampled in June, July, August and September 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 8-50.

Table 8-46 Whale Tail 2020 Whale Tail Attenuation Pond Water Quality Monitoring (ST-WT-1)

ST-WT-1 Parameter	Unit	Annual Average	5/23/2020	5/25/2020	6/1/2020	6/8/2020	6/14/2020	6/22/2020	6/29/2020	7/7/2020	7/12/2020	7/20/2020	7/26/2020	8/3/2020	8/10/2020	8/17/2020	8/24/2020	9/1/2020	9/7/2020
Field Measured																			
Temperature	°C	*4.4*	1	0.3	0.5	1.7	2.9	3.1	5.2	10.1	11.3	10	11.6	13.9	15	9.9	8.3	7.4	4.7
pH	-	*7.54*	7.39	7.02	7.22	7.72	7.23	7.25	7.54	7.02	7.7	7.6	7.68	7.75	8.15	7.71	7.51	7.59	7.81
Conductivity	uS/cm	*337.5*	519.6	475.1	306	203	262	364		452.8	427	381	350	363	287	356	397	417	411
Dissolved oxygen	mg/L	*16.71*	12.62	11.5	12.29	11.95	98.2	10.45		10.43	9.17	9.53	97.2	9.39	9.56	10.61	10.8	10.1	11.57
Turbidity	NTU	*63.9*	20.2	2.99	45.7	214	395	110	77.5	38	29.7	35.4	48.6	24.1	17.6	28.9	28.7	88.6	70.7
Conventional Parameters																			
Hardness	mg CaCO3/L	*156*	175	159	117	82	98	162	151	185	198	222	146	170	130	125	186	214	216
Total alkalinity, as CaCO3	mg CaCO3/L	*59*	55	51	44	42	40	53	47	60	62	70	56	56	57	56	55	58	56
TSS	mg/L	*67*	19	14	41	189	331	120	-	32	67	49	42	18	18	51	52	84	64
TDS	mg/L	*212*	364	326	215	149	194	244	219	277	272	327	218	238	190	237	269	260	275
Major Ions																			
Chloride	mg/L	*52.8*	91.2	77.6	46.4	29.4	39.6	52.5	59.2	68.8	51.9	68.3	48.8	48.1	38	62.7	66.4	62	66.2
Fluoride	mg/L	*0.12*	0.14	0.13	0.12	0.08	0.08	0.07	0.1	0.11	0.11	0.14	0.12	0.14	0.13	0.11	0.09	0.11	0.09
Sulphate	mg/L	*28.9*	20.6	18.6	16.3	11.7	21.5	27.8	31.1	28.1	36.4	56.6	42.4	38.1	27.7	23.1	35.1	49.7	51.8
Nutrients and Chlorophyll a																			
Total ammonia as NH4	mg N/L	*1.35*	2.55	1.99	1.71	0.64	0.95	2.05	2.02	1.84	2.1	4.58	1.5	1.69	1.16	0.55	1.13	1	0.71
Un-Ionized Ammonia, calculated	mg N/L	*0.02*	0.04	0.03	0.01	< 0.01	< 0.01	0.02	0.01	0.02	0.03	0.05	< 0.01	0.04	0.04	< 0.01	< 0.01	0.01	< 0.01
Nitrate	mg N/L	*2.47*	4.23	4.01	2.68	1.44	2.38	4.35	4.24	4.3	4.89	6.57	1.99	3.6	2.41	1.09	2.78	2.5	1.64
Nitrite	mg N/L	*0.14*	0.1	0.25	0.11	0.09	0.13	0.25	0.28	0.21	0.23	0.33	0.13	0.18	0.08	0.06	0.2	0.18	0.11
Total phosphorus	mg/L	*0.05*	0.01	0.02	0.05	0.15	0.25	0.08	0.08	0.01	0.089	0.03	0.01	< 0.01	< 0.01	0.03	0.03	0.05	0.05
Total Metals																			
Aluminum	mg/L	*0.801*	0.119	0.137	0.589	2.014	3.936	1.269	0.959	0.371	0.514	0.731	0.299	0.41	0.298	0.547	0.494	1.856	1.412
Arsenic	mg/L	*0.0304*	0.0159	0.016	0.0141	0.025	0.0363	0.0453	0.0321	0.0233	0.0386	0.0285	0.019	0.026	0.0137	0.0293	0.0282	0.0448	0.0475
Barium	mg/L	*0.0817*	0.0975	0.092	0.0714	0.0794	0.0982	0.0979	0.086	0.1014	0.111	0.1048	0.082	0.0881	0.0368	0.0781	0.0904	0.1126	0.1243
Cadmium	mg/L	*0.00003*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.0115*	0.0025	0.0048	0.0075	0.0305	0.0308	0.0098	0.0088	0.0071	0.0084	0.0087	0.0024	0.0097	0.0076	0.0089	0.0089	0.0415	0.0237
Copper	mg/L	*0.0033*	0.0045	0.004	0.0034	0.0054	0.0086	0.0074	0.0043	0.0034	0.0042	0.0062	0.0031	0.0029	0.0039	< 0.0005	0.0027	0.0039	0.0048
Iron	mg/L	*1.98*	0.59	0.67	1.5	4.2	11	2.6	1.8	1.2	1.5	2.5	1.2	0.94	1	1.2	1.3	3.8	3
Lead	mg/L	*0.0007*	0.0004	< 0.0003	< 0.0003	0.0029	0.005	0.0008	< 0.0003	< 0.0003	< 0.0003	0.0007	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017	0.0013	< 0.00017
Manganese	mg/L	*0.3702*	0.2209	0.2305	0.2143	0.3019	0.3742	0.515	0.6217	0.5179	0.53	0.675	0.3711	0.3328	0.2998	0.1811	0.402	0.6399	0.7909
Mercury	mg/L	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0055*	0.01	0.0087	0.0086	0.0044	0.0049	0.0067	0.0051	0.009	0.009	0.0089	0.0082	0.0081	0.0042	0.0037	0.0037	0.0058	0.0031
Nickel	mg/L	*0.0175*	0.0084	0.0083	0.0097	0.0193	0.0286	0.0343	0.0225	0.0255	0.029	0.0419	0.0161	0.0257	0.0121	0.0113	0.0199	0.0409	0.0381
Selenium	mg/L	*0.0009*	< 0.001	< 0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	0.002	< 0.001	< 0.001	< 0.001	0.001	0.002	< 0.001
Silver	mg/L	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.004*	< 0.001	< 0.001	0.003	0.011	0.018	0.008	0.003	< 0.001	< 0.001	0.006	0.002	< 0.001	< 0.001	< 0.001	0.002	0.007	0.006

ST-WT-1 Parameter	Unit	Annual Average	9/14/2020	9/21/2020	9/28/2020	10/5/2020	10/13/2020	10/19/2020	10/26/2020	11/1/2020	11/7/2020	11/9/2020	11/16/2020	11/23/2020	12/1/2020	12/7/2020	12/27/2020
Field Measured																	
Temperature	°C	*4.4*	3.2	4.5	3.9	1.9	1.4	1.8	1.1	1.0	0.7	0.8	0.9	0.5	0.6	0.7	0.3
pH	-	*7.54*	7.79	7.61	7.59	7.7	7.81	7.73	7.58	7.33	7.6	7.56	7.57	7.86	7.22	7.59	6.77
Conductivity	uS/cm	*337.5*	474	634	361	350	296	270	254	204.9	261	291	225	226	175.4	223	246
Dissolved oxygen	mg/L	*16.71*	11.73	11.14	12.22	10.75	10.71	11.37	11.8	10.84	11.22	11.29	11.49	12.35	11.37	11.98	12.35
Turbidity	NTU	*63.9*	40.3	30.8	39.4	27.2	119	49.4	18.6	20.7	30.4	42.2	65.2	39.7	204	34.6	9.18
Conventional Parameters																	
Hardness	mg CaCO3/L	*156*	234	314	169	177	124	123	104	82	118	102	313	94	78	115	116
Total alkalinity, as CaCO3	mg CaCO3/L	*59*	65	54	55	60	61	61	72	86	64	71	68	70	67	68	48
TSS	mg/L	*67*	49	33	83	19	125	38	18	29	16	8	65	48	283	< 1	6
TDS	mg/L	*212*	304	412	236	222	143	11	10	9	162	178	166	157	132	166	199
Major Ions																	
Chloride	mg/L	*52.8*	66.9	148.3	64.1	53.8	38.3	38.7	37	28	33	38	33.7	35.3	27.4	34.4	35.6
Fluoride	mg/L	*0.12*	0.14	0.04	0.11	0.14	0.14	0.15	0.16	0.13	0.15	0.15	0.14	0.15	0.14	0.17	0.14
Sulphate	mg/L	*28.9*	62.7	25.3	34.9	34.7	28.3	22.8	21	17	15.5	17.7	17.8	23.2	16.6	16.2	33.1
Nutrients and Chlorophyll a																	
Total ammonia as NH4	mg N/L	*1.35*	1.72	1.46	0.63	0.95	0.58	0.42	0.37	0.73	2	2.2	1.33	0.88	0.3	1.04	0.38
Un-Ionized Ammonia, calculated	mg N/L	*0.02*	0.03	0.02	< 0.01	0.02	0.01	0.011	0.0071	0.012	0.04	0.04	0.02	0.01	< 0.01	0.02	< 0.01
Nitrate	mg N/L	*2.47*	3.61	4.02	1.59	1.48	1.34	0.63	0.54	0.81	2.59	3.37	1.45	0.73	0.3	0.96	0.39
Nitrite	mg N/L	*0.14*	0.2	0.08	0.07	0.07	0.1	0.05	0.06	0.12	0.19	0.16	0.1	0.05	0.05	0.08	0.02
Total phosphorus	mg/L	*0.05*	0.04	0.02	0.02	0.01	0.17	< 0.04	< 0.04	0.066	< 0.04	< 0.04	0.065	0.04	0.2	0.01	0.03
Total Metals																	
Aluminum	mg/L	*0.8007*	0.885	0.526	0.594	0.601	1.491	0.935	0.212	0.214	0.32	0.64	1.245	0.52	1.678	0.561	0.046
Arsenic	mg/L	*0.0304*	0.0669	0.0176	0.0217	0.0677	0.0203	0.0163	0.0134	0.013	0.0185	0.0149	0.0151	0.0167	0.0124	0.0177	0.0117
Barium	mg/L	*0.0817*	0.1161	0.1243	0.0733	0.083	0.0681	0.0714	0.0659	0.0505	0.0798	0.066	0.0865	0.0621	0.0606	0.0763	0.0619
Cadmium	mg/L	*0.00003*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0000200	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00003	< 0.00002	< 0.00002	0.0002	0.00013	< 0.00002
Chromium	mg/L	*0.0115*	0.0141	0.0071	0.005	0.0188	0.0112	0.0315	0.0066	0.003	0.0033	0.0046	0.0246	0.0045	0.0144	0.0089	0.0006
Copper	mg/L	*0.0033*	0.0033	0.0023	0.0016	0.0025	0.0042	0.002	0.0008	0.0018	0.0054	0.0057	0.0006	0.0021	0.0032	< 0.0005	0.0007
Iron	mg/L	*1.98*	2.3	1.6	1.7	1.3	2.8	1.6	0.67	0.85	1.3	1.8	2.6	1.4	3.3	1.7	0.48
Lead	mg/L	*0.0007*	< 0.00017	< 0.00017	< 0.00017	< 0.00017	0.0009	< 0.00017	0.0003	< 0.00017	0.0006	0.0012	0.0027	0.0004	< 0.00017	< 0.00017	< 0.00017
Manganese	mg/L	*0.3702*	0.6891	0.6801	0.4601	0.4306	0.2462	0.2404	0.201	0.18	0.254	0.1949	0.2648	0.1795	0.3602	0.3612	0.2552
Mercury	mg/L	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0055*	0.005	0.0021	0.0027	0.0044	0.0041	0.0046	0.0044	0.0035	0.0076	0.0066	0.0073	0.0046	0.0023	0.0053	0.0048
Nickel	mg/L	*0.0175*	0.0325	0.0223	0.0139	0.0267	0.0143	0.0148	0.0057	0.0038	0.0087	0.0093	0.0107	0.0046	0.0074	0.0064	0.0048
Selenium	mg/L	*0.0009*	< 0.001	< 0.001	< 0.001	< 0.0005	0.0011	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0009	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Silver	mg/L	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.004*	0.005	0.003	0.001	< 0.001	0.009	0.028	< 0.001	< 0.001	< 0.001	0.004	< 0.001	< 0.001	0.005	< 0.001	< 0.001

Table 8-47 Whale Tail 2020 Waste Rock Storage Facility (WRSF) Pond Water Quality Monitoring (ST-WT-3)

ST-WT-3	Unit	*Annual Average*			6/1/2020	6/7/2020	6/14/2020	6/21/2020	6/28/2020	7/5/2020	7/12/2020	7/19/2020	7/26/2020	8/2/2020	8/9/2020	8/16/2020	8/23/2020	8/30/2020	9/6/2020	9/13/2020	9/20/2020	9/27/2020
Parameter		*2018*	*2019*	*2020*																		
Field Measured																						
Temperature	°C	*-*	*8.61*	*8.63*	2.4	2.2	2.8	8.5	9.8	17.5	17.5	13.1	11.9	13.8	17.3	9.7	7.7	6.8	4.2	4	3.2	2.9
pH	-	*6.84*	*7.08*	*7.18*	8.09	7.63	7.06	7.23	7.08	6.2	7.42	7.22	7.28	7.17	7.04	7.05	6.92	7.01	7.11	7.32	7.13	7.36
Conductivity	uS/cm	*-*	*501.84*	*280.84*	133.9	123.7	167.6	146.8	241	232.8	209.3	233	291	281	298	342	326	353	298	413	513	452
Dissolved oxygen	mg/L	*-*	*16.68*	*9.82*	12.43	10.39	8.92	9.41	10.35	8.39	8.74	8.81	8.88	8.61	6.59	9.86	9.49	10.06	11.42	11.34	11.2	11.82
Turbidity	NTU	*222.45*	*27.53*	*23.89*	148	87.2	36.1	76.2	15.2	7.14	5.6	6.59	7.3	6.37	3.33	6.06	4.2	4.15	8.27	1.84	2.03	4.44
Conventional Parameters																						
Hardness	mg CaCO3/L	*64.00*	*484.60*	*135.44*	68	56	62	87	123	90	89	98	112	143	127	146	177	238	132	215	254	221
Total alkalinity, as CaCO3	mg CaCO3/L	*14.50*	*43.53*	*42.33*	36	31	27	33	26	30	30	32	52	49	43	52	50	51	51	51	55	63
TSS	mg/L	*47.00*	*14.00*	*15.94*	88	61	23	6	13	5	3	8	7	6	3	5	7	4	14	1	31	2
Major Ions																						
Chloride	mg/L	*16.45*	*24.71*	*11.41*	3.5	2.9	4.7	4.1	8.1	10.1	9.2	10	12.3	12.1	13.8	13.7	12.6	16.6	10.9	16.2	23.3	21.2
Fluoride	mg/L	*0.05*	*0.15*	*0.05*	0.04	0.05	0.05	0.04	0.05	0.06	0.05	0.05	0.06	0.06	0.06	0.1	0.05	0.05	0.04	0.05	0.06	0.06
Sulphate	mg/L	*37.95*	*148.19*	*79.87*	15.4	24.4	57.2	33.1	65.2	57.9	47.2	55.6	75.7	66.2	80.2	87.2	87.3	126	84.1	146	193	136
Nutrients and Chlorophyll a																						
Total ammonia as NH4	mg/L	*0.08*	*0.90*	*0.28*	0.67	0.94	0.83	0.46	0.34	0.3	0.25	0.21	0.06	0.19	0.15	0.16	0.15	0.05	0.11	0.07	0.06	0.1
Un-Ionized Ammonia, calculated	mg/L	*-*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg/L	*2.44*	*8.90*	*2.31*	0.69	0.69	0.68	0.83	2.23	2.03	2.34	2.5	3.84	2.31	3.34	3.66	2.49	2.37	2.89	3.57	2	3.14
Nitrite	mg/L	*0.01*	*0.45*	*0.03*	0.07	0.06	0.05	0.02	0.02	< 0.01	0.03	0.02	< 0.01	0.02	0.03	0.04	0.04	0.02	0.02	0.03	0.01	0.02
Total phosphorus	mg/L	*-*	*0.04*	*0.03*	0.12	0.08	0.04	0.05	0.04	< 0.01	< 0.04	< 0.01	0.044	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total Metals																						
Aluminum	mg/L	*2.792*	*0.676*	*0.627*	3.759	2.094	1.111	2.147	0.475	0.188	0.124	0.216	0.155	0.202	0.089	0.179	0.127	0.074	0.191	0.015	0.037	0.106
Arsenic	mg/L	*0.0110*	*0.0079*	*0.0113*	0.0268	0.0169	0.0062	0.0167	0.0046	0.0019	0.0035	0.004	0.0047	0.022	0.0045	0.012	0.0051	0.0048	0.0588	0.0028	0.0026	0.0047
Barium	mg/L	*0.0569*	*0.0830*	*0.0563*	0.0579	0.0494	0.0446	0.0578	0.0486	0.0393	0.0395	0.0407	0.0415	0.0626	0.0451	0.0582	0.0697	0.0878	0.0554	0.0663	0.0738	0.0749
Cadmium	mg/L	*0.00002*	*0.00004*	*0.00002*	< 0.00002	< 0.00002	0.00008	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00003	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.0135*	*0.0054*	*0.0100*	0.0709	0.0394	0.0071	0.0207	0.0046	0.0021	0.014	0.0026	0.0021	0.0026	0.001	0.0025	0.0016	0.0018	0.0038	0.0008	0.0011	< 0.0006
Copper	mg/L	*0.0082*	*0.0030*	*0.0032*	0.0083	0.0063	0.004	0.0067	0.0027	0.0017	0.0008	0.0027	0.003	0.0032	0.0023	< 0.0005	0.0026	0.0024	0.0044	0.0018	0.0018	0.0016
Iron	mg/L	*5.2*	*1.3*	*4.4*	5.9	3.4	1.4	3.3	0.72	0.48	59	0.52	0.45	0.51	0.31	0.49	1.1	0.65	0.58	0.14	0.17	0.42
Lead	mg/L	*0.0033*	*0.0004*	*0.0005*	0.0021	0.0019	0.0004	0.0013	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017
Mercury	mg/L	*0.00001*	*0.00002*	*0.00001*	0.00002	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.001*	*0.001*	*0.001*	0.001	< 0.0005	0.0006	< 0.0005	0.0008	< 0.0005	0.001	0.0017	0.0019	0.0028	< 0.0005	0.002	< 0.0005	0.001	0.0008	< 0.0005	0.0005	0.0008
Nickel	mg/L	*0.0243*	*0.0361*	*0.0277*	0.0438	0.0325	0.0252	0.0339	0.0359	0.0222	0.0271	0.02	0.0171	0.0315	0.0168	0.0231	0.0259	0.0276	0.0462	0.0256	0.0233	0.0212
Selenium	mg/L	*0.0005*	*0.0035*	*0.0012*	< 0.001	0.002	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001
Silver	mg/L	*0.0001*	*0.0002*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0002*	*0.0003*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.017*	*0.005*	*0.003*	0.011	0.01	0.003	0.009	0.005	0.003	< 0.001	0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.001	0.003	0.002	0.001	0.002	< 0.001
Dissolved Metals																						
Aluminum	mg/L	*-*	*0.017*	*0.006*	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006
Arsenic	mg/L	*-*	*0.004*	*0.006*	0.0131	0.0047	0.0016	0.0048	< 0.0005	0.0011	0.001	0.0019	0.0027	0.0099	0.0019	0.0076	0.0023	< 0.0005	0.0535	0.001	0.0019	0.0017
Barium	mg/L	*-*	*0.0699*	*0.0457*	0.0227	0.023	0.0361	0.0304	0.0405	0.041	0.0332	0.0406	0.042	0.0393	0.0453	0.0515	0.0583	0.0628	0.0627	0.0587	0.0629	0.0723

ST-WT-3	Unit	Annual Average			6/1/2020	6/7/2020	6/14/2020	6/21/2020	6/28/2020	7/5/2020	7/12/2020	7/19/2020	7/26/2020	8/2/2020	8/9/2020	8/16/2020	8/23/2020	8/30/2020	9/6/2020	9/13/2020	9/20/2020	9/27/2020
Parameter		2018	2019	2020																		
Cadmium	mg/L	-	0.00012	0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00009	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	-	0.0009	0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	-	0.0017	0.0013	0.0013	0.0012	0.0012	< 0.0005	0.0016	0.0013	< 0.0005	0.0019	0.0021	0.0009	0.0011	< 0.0005	0.0017	< 0.0005	0.0025	0.0017	0.0011	0.0011
Iron	mg/L	-	0.09	0.03	< 0.01	0.12	< 0.01	< 0.01	< 0.01	0.05	0.03	0.02	0.02	0.02	0.01	0.04	0.12	0.05	0.03	< 0.01	< 0.01	0.03
Lead	mg/L	-	0.0003	0.0002	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017
Manganese	mg/L	-	0.4582	0.2381	0.2092	0.3574	0.2117	0.3162	0.325	0.1483	0.0855	0.0843	0.1467	0.1957	0.1069	0.2933	0.369	0.2318	0.4047	0.142	0.2483	0.4102
Mercury	mg/L	-	0.00002	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00003	< 0.00001	< 0.00001
Molybdenum	mg/L	-	0.0017	0.0008	0.0006	< 0.0005	0.0008	< 0.0005	< 0.0005	< 0.0005	0.0005	0.0008	0.0022	0.0018	< 0.0005	0.0018	0.0006	< 0.0005	0.0009	0.0006	< 0.0005	0.0007
Nickel	mg/L	-	0.033	0.021	0.0114	0.014	0.0189	0.0165	0.0304	0.0236	0.0136	0.0196	0.0173	0.0189	0.0162	0.0228	0.0244	0.025	0.0447	0.0201	0.0252	0.0239
Selenium	mg/L	-	0.003	0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.003	< 0.001	< 0.001	< 0.001
Silver	mg/L	-	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	-	0.0002	0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	-	0.002	0.001	< 0.001	< 0.001	0.001	< 0.001	0.003	0.004	< 0.001	< 0.001	< 0.001	< 0.001	0.001	0.001	0.002	< 0.001	0.002	< 0.001	< 0.001	< 0.001

Table 8-48 Whale Tail Pit Sump 2020 Water Quality Monitoring (ST-WT-4)

ST-WT-4	Unit	*Annual Average*		1/8/2020	1/31/2020	2/6/2020	3/5/2020	3/23/2020	4/5/2020	4/19/2020	5/19/2020	6/1/2020	6/7/2020	6/10/2020	6/21/2020	6/28/2020	7/5/2020	7/15/2020	7/19/2020	8/2/2020	8/12/2020	8/16/2020	8/23/2020	8/30/2020
Parameter		*2019*	*2020*																					
Field Measured																								
pH	-	*7.49*	*7.81*	7.63	7.25	7.57	7.08	7.66	7.65	7.84	8.05	8.33	7.87	7.82	7.35	7.83	7.32	7.88	7.95	8.02	8.15	7.83	7.95	8.01
Turbidity	NTU	*43*	*66*	5.05	26.8	53.6	5.3	29.2	7.82	125	207	84.2	170	79	15.3	9.03	23.87	35	23.9	39.3	29.1	53.6	64.5	541
Conventional Parameters																								
Hardness	mg CaCO3/L	*323*	*353*	618	517	534	299	287	263	404	343	259	182	256	236	279	303	274	319	288	229	238	469	537
Total alkalinity, as CaCO3	mg CaCO3/L	*71*	*118*	88	96	132	88	101	64	77	117	77	52	29	77	80	100	86	94	83	73	75	125	168
TSS	mg/L	*90*	*1953*	4	30	71	7	34	7	273	268	125	132	10	4	7	9	24	22	6	43	47	84	583
Major Ions																								
Chloride	mg/L	*105.2*	*111.6*	331.9	280.6	61.8	169.3	163.5	160.3	171.9	157.6	111.3	75.9	99.1	52	95.6	106.4	79.8	103.3	104.9	88.6	87.4	124.8	121.8
Fluoride	mg/L	*0.15*	*0.20*	0.15	0.16	0.19	0.16	0.17	0.18	0.2	0.22	0.21	0.16	0.18	0.09	0.19	0.2	0.21	0.19	0.22	0.24	0.21	0.19	0.2
Sulphate	mg/L	*122.5*	*59.0*	16.5	19.3	28.3	12.3	10.9	18.3	6.7	21.5	23.4	22.6	33.3	84.7	39.6	37.3	61.6	76.6	52.6	17.9	27.2	138	174
Nutrients and Chlorophyll a																								
Total ammonia as NH4	mg-N/L	*-*	*4.79*	3.83	2.38	0.05	0.54	4.14	2.91	8.91	21.83	4.73	1.91	2.09	2.37	5.49	3.34	7.05	6.19	2.48	0.96	1.93	4.97	10.33
Un-Ionized Ammonia, calculated	mg-N/L	*-*	*0.11*	0.05	0.05	< 0.01	< 0.01	0.08	0.05	0.15	0.4	0.1	0.03	0.01	0.03	0.12	0.07	0.17	0.14	0.08	0.02	0.03	0.1	0.26
Nitrate	mg-N/L	*16.33*	*9.76*	3.52	2.9	16.7	0.68	3.31	2.9	17.4	28	5.94	4.11	5.41	3.44	8.02	8.92	1.49	9.28	5.03	0.53	2.3	16.6	34.4
Nitrite	mg-N/L	*0.76*	*0.50*	0.16	0.36	0.7	0.02	0.23	0.15	0.36	0.79	0.25	0.23	0.24	0.54	0.28	< 0.01	0.6	0.5	0.34	0.05	0.05	0.97	2.6
Total phosphorus	mg/L	*0.06*	*0.06*	0.03	0.11	0.05	< 0.01	0.04	< 0.01	0.33	0.18	0.08	0.1	0.02	< 0.01	0.06	< 0.01	0.02	< 0.01	0.02	< 0.01	0.05	< 0.01	0.2
Total orthophosphate (as phosphorus)	mg/L	*0.09*	*0.04*	0.02	0.05	0.11	0.02	0.1	0.02	0.03	0.07	0.02	0.02	0.02	0.05	0.02	0.01	0.07	0.06	0.07	0.05	0.01	0.01	0.05
Total Metals																								
Aluminum	mg/L	*1.500*	*4.890*	0.116	1.305	1.038	0.075	1.052	0.094	6.133	1.945	3.459	2.648	0.254	0.201	0.42	0.085	0.881	0.643	1.11	0.818	1.934	2.156	11.244
Arsenic	mg/L	*0.040*	*0.053*	0.0205	0.0179	0.0358	0.0368	0.0332	0.0351	0.0319	0.0327	0.058	0.0649	0.0112	0.224	0.0409	0.0607	0.0514	0.0895	0.0707	0.0465	0.034	0.0411	0.065
Barium	mg/L	*0.122*	*0.282*	0.4325	0.3595	0.3572	0.1605	0.2167	0.1855	0.2723	0.2759	0.1726	0.1369	0.0946	0.0629	0.1391	0.1395	0.1622	0.1402	0.1515	0.1399	0.166	0.1576	0.3486
Cadmium	mg/L	*0.00003*	*0.00003*	0.00002	0.00024	< 0.0000200	0.00007	< 0.00002	< 0.00002	< 0.00002	< 0.0000200	0.00003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.037*	*0.159*	0.011	0.0349	0.0429	0.001	0.021	0.0031	0.1522	0.0941	0.1084	0.0608	0.005	0.0082	0.0131	0.0039	0.0248	0.0222	0.038	0.0278	0.0407	0.1386	0.3825
Copper	mg/L	*0.0095*	*0.0225*	0.0057	0.0584	0.0225	< 0.0005	0.0104	0.0096	0.0605	0.009	0.0088	0.0157	0.0013	0.0453	0.0111	0.0029	0.0154	0.0185	0.0038	0.0588	0.0055	0.0052	0.0195
Iron	mg/L	*2.71*	*6.43*	0.33	2.4	1.9	1.3	1.7	0.19	11	5	6.1	4.8	0.41	0.55	0.8	0.33	1.4	1.2	1.9	1.4	3.4	3.9	20
Lead	mg/L	*0.001*	*0.008*	< 0.0003	0.0028	0.0042	< 0.0003	0.0013	< 0.0003	0.0061	0.0041	0.0031	0.004	< 0.0003	0.0036	< 0.0003	< 0.0003	0.0009	< 0.0003	0.0004	< 0.00017	0.0056	< 0.00017	0.0101
Manganese	mg/L	*0.377*	*0.442*	0.583	0.6503	0.5206	1.1796	0.3476	0.3058	0.4424	0.2158	0.1891	0.1802	0.2464	0.524	0.2012	0.1579	0.1566	0.1825	0.1198	0.2252	0.2519	0.3106	0.4771
Mercury	mg/L	*0.00004*	*0.00001*	< 0.0000100	< 0.00001	< 0.0000100	0.00001	< 0.00001	< 0.00001	0.00002	< 0.0000100	0.00003	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.009*	*0.021*	0.0108	0.1481	0.0066	0.0096	0.0091	0.0118	0.0075	0.0182	0.0355	0.018	0.0009	0.0036	0.0268	0.0207	0.0324	0.0202	0.02	0.0139	0.0225	0.0261	0.0268
Nickel	mg/L	*0.04*	*0.07*	0.03	0.1466	0.0612	0.0022	0.0139	0.01	0.0578	0.0635	0.0487	0.0342	0.0124	0.1238	0.0219	0.0349	0.0302	0.06	0.0309	0.152	0.0195	0.0599	0.1647
Selenium	mg/L	*0.004*	*0.003*	< 0.001	< 0.001	0.003	< 0.001	0.002	< 0.001	0.01	0.002	0.002	< 0.001	< 0.001	0.001	< 0.001	0.002	0.002	< 0.001	< 0.001	< 0.001	0.002	0.002	0.005
Silver	mg/L	*0.0001*	*0.0002*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001	0.0049	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0002*	*0.0006*	< 0.0008	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0004
Zinc	mg/L	*0.004*	*0.020*	0.001	0.018	0.005	0.004	0.004	< 0.001	0.017	0.008	0.011	0.145	< 0.001	0.053	< 0.001	< 0.001	< 0.001	0.002	0.001	< 0.001	0.005	0.006	0.029

ST-WT-4	Unit	*Annual Average*		9/6/2020	9/14/2020	9/21/2020	9/27/2020	10/7/2020	10/11/2020	10/18/2020	10/25/2020	11/8/2020	11/16/2020	11/22/2020	11/29/2020	12/9/2020	12/20/2020
Parameter		*2019*	*2020*														
Field Measured																	
pH	-	*7.49*	*7.81*	8.2	8.18	8.04	7.9	8.04	7.74	8.72	7.68	8.22	7.58	7.69	7.6	7.76	6.88
Turbidity	NTU	*43*	*66*	58.7	68.7	6.26	5.7	127	64	-	199	54.5	7.3	11.8	2.46	2.06	2.43
Conventional Parameters																	
Hardness	mg CaCO3/L	*323*	*353*	521	508	586	509	210	183	1479	194	312	123	155	142	159	150
Total alkalinity, as CaCO3	mg CaCO3/L	*71*	*118*	132	128	155	130	84	79	927	90	112	86	88	89	84	53
TSS	mg/L	*90*	*40*	88	56	8	3	113	35	-	160	40	6	11	2	< 1	1
Major Ions																	
Chloride	mg/L	*105.2*	*111.6*	103.2	110	103.2	104.3	69	78.1	86.3	72	100	71.4	70.5	65.2	65.4	59.9
Fluoride	mg/L	*0.15*	*0.20*	0.21	0.21	0.2	0.2	0.24	0.22	0.22	0.24	0.21	0.21	0.22	0.22	0.24	0.22
Sulphate	mg/L	*122.5*	*59.0*	236	216	218	178	30	25.4	39.2	30	36.7	30.6	24.5	20.3	19.5	37.1
Nutrients and Chlorophyll a																	
Total ammonia as NH4	mg-N/L	*-*	*4.79*	6.15	7.7	17.77	15.38	1.34	0.48	1.8	1.5	7.5	1.1	1.51	0.64	1.82	0.45
Un-Ionized Ammonia, calculated	mg-N/L	*-*	*0.11*	0.17	0.22	0.44	0.35	0.05	0.01	0.21	0.034	0.25	0.03	0.04	0.02	0.05	< 0.01
Nitrate	mg-N/L	*16.33*	*9.76*	19.8	29.6	45.6	37.5	1.15	0.11	7.89	1.75	13.5	0.81	1.18	0.32	1.38	0.12
Nitrite	mg-N/L	*0.76*	*0.50*	1.79	1.9	1.92	1.21	0.15	0.1	0.16	0.11	0.48	0.05	0.08	0.01	0.05	< 0.01
Total phosphorus	mg/L	*0.06*	*0.06*	-	< 0.01	< 0.01	< 0.01	< 0.01	0.11	0.1	0.16	< 0.04	< 0.04	< 0.01	< 0.01	< 0.01	< 0.01
Total orthophosphate (as phosphorus)	mg/L	*0.09*	*0.04*	0.01	0.01	< 0.01	< 0.01	0.07	< 0.01	0.02	0.07	0.13	0.03	0.04	0.01	0.02	< 0.01
Total Metals																	
Aluminum	mg/L	*1.500*	*4.890*	1.352	1.192	0.075	0.079	3.195	1.185	119.849	4.609	1.53	0.103	0.254	0.035	0.04	0.031
Arsenic	mg/L	*0.040*	*0.053*	0.14	0.0753	0.0272	0.0395	0.0329	0.0462	0.178	0.0521	0.0259	0.0268	0.029	0.0305	0.032	0.0283
Barium	mg/L	*0.122*	*0.282*	0.1319	0.1128	0.0919	0.0855	0.1354	0.1109	3.9849	0.2164	0.2402	0.1115	0.1027	0.0832	0.0849	0.108
Cadmium	mg/L	*0.00003*	*0.00003*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00013	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.037*	*0.159*	0.0531	0.0443	0.0034	0.0031	0.1258	0.0372	3.8797	0.1317	0.0523	0.003	0.0066	0.001	< 0.0006	0.0009
Copper	mg/L	*0.0095*	*0.0225*	0.0049	0.0082	0.0478	0.0302	0.0049	0.0017	0.223	0.0086	0.035	0.0048	0.0221	0.0029	0.0054	< 0.0005
Iron	mg/L	*2.71*	*6.43*	2.6	2.1	0.29	0.23	5.4	2	130	8.5	2.9	0.19	0.5	0.09	0.14	0.12
Lead	mg/L	*0.001*	*0.008*	-	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	0.1964	0.0025	0.0053	< 0.00017	0.0041	0.0004	0.0005	< 0.00017
Manganese	mg/L	*0.377*	*0.442*	0.2307	0.2402	0.3159	0.2312	0.2013	0.2382	5.1451	0.2976	0.1704	0.1535	0.1456	0.1782	0.1915	0.252
Mercury	mg/L	*0.00004*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00004
Molybdenum	mg/L	*0.009*	*0.021*	0.0191	0.0294	0.0442	0.0562	0.0089	0.0084	0.005	0.008	0.0342	0.0124	0.0111	0.0078	0.0086	0.008
Nickel	mg/L	*0.04*	*0.07*	0.0949	0.0715	0.0559	0.0512	0.036	0.0127	0.925	0.0527	0.0345	0.0045	0.0064	0.0053	0.041	0.0028
Selenium	mg/L	*0.004*	*0.003*	0.004	0.002	0.006	0.0037	< 0.0005	< 0.0005	0.0343	0.0008	< 0.0005	< 0.0005	0.0014	< 0.0005	< 0.0005	< 0.0005
Silver	mg/L	*0.0001*	*0.0002*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0002*	*0.0006*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0129	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.004*	*0.020*	0.002	0.005	< 0.001	< 0.001	0.002	0.005	0.341	0.01	0.009	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Table 8-49 IVR Pit Sump 2020 Water Quality Monitoring (ST-WT-18)

ST-WT-18 Parameter	Unit	*Annual Average*	9/6/2020	10/4/2020
Field Measured				
Temperature	°C	*2.8*	4.6	0.9
pH	-	*7.39*	7.33	7.45
Conductivity	uS/cm	*1009*	1033	985
Dissolved oxygen	mg/L	*10.43*	11.88	8.97
Turbidity	NTU	*35.7*	58.1	13.2
Conventional Parameters				
Hardness	mg CaCO3/L	*610*	517	703
Total alkalinity, as CaCO3	mg CaCO3/L	*78*	51	105
TSS	mg/L	*28*	48	8
TDS	mg/L	*723*	680	766
Major Ions				
Chloride	mg/L	*296.7*	299.5	293.9
Fluoride	mg/L	*0.12*	0.07	0.16
Sulphate	mg/L	*34.9*	9.5	60.3
Nutrients and Chlorophyll a				
Total ammonia as NH4	mg NH3/L	*1.39*	0.92	1.85
Un-Ionized Ammonia, calculated	mg N/L	*0.02*	< 0.01	0.02
Nitrate	mg N/L	*2.09*	0.83	3.35
Nitrite	mg N/L	*0.19*	0.02	0.35
Total phosphorus	mg/L	*0.02*	0.02	< 0.01
Total orthophosphate (as phosphorus)	mg/L	*0.01*	< 0.01	< 0.01
Total Metals				
Aluminum	mg/L	*0.615*	1.063	0.167
Arsenic	mg/L	*0.0033*	0.0038	0.0028
Barium	mg/L	*0.3045*	0.3025	0.3064
Cadmium	mg/L	*0.00002*	< 0.00002	< 0.00002
Chromium	mg/L	*0.0087*	0.0152	0.0022
Copper	mg/L	*0.0044*	0.0049	0.0038
Iron	mg/L	*1.1*	1.9	0.33
Lead	mg/L	*0.00017*	< 0.00017	< 0.00017
Manganese	mg/L	*2.363*	2.159	2.5679
Mercury	mg/L	*0.00001*	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0019*	< 0.0005	0.0032
Nickel	mg/L	*0.0316*	0.0276	0.0356
Selenium	mg/L	*0.0008*	< 0.001	< 0.0005
Silver	mg/L	*0.0001*	< 0.0001	< 0.0001
Thallium	mg/L	*0.0002*	< 0.0002	< 0.0002
Zinc	mg/L	*0.006*	0.01	< 0.001

Table 8-50 Whale Tail 2020 Lake A47 Water Quality Monitoring (ST-WT-6)

ST-WT-6	Unit	Annual Average			6/14/2020	7/26/2020	8/9/2020	9/6/2020
Parameter		2018	2019	2020				
Field Measured								
pH	-	6.88	7.01	7.52	7.37	7.42	7.64	7.64
Turbidity	NTU	0.83	3.66	14.46	12.7	3.21	2.42	39.5
Conventional Parameters								
Hardness	mg CaCO3/L	70	243	155	71	199	160	191
Total alkalinity, as CaCO3	mg CaCO3/L	23	36	44	19	51	53	53
TSS	mg/L	1	3	15	9	6	2	42
TDS	mg/L	110	403	217	133	258	220	255
Total organic carbon	mg/L	5	6	7	4	7.1	9.2	7
Dissolved organic carbon	mg/L	5.2	6.4	6.1	3.8	5.1	8.9	6.7
Major Ions								
Carbonate	mg CaCO3/L	2	2	4	< 2	< 5	< 5	< 5
Bicarbonate	mg CaCO3/L	23	36	44	19	51	53	53
Chloride	mg/L	24	177	70	36.9	98	72.7	70.7
Reactive Silica	mg/L	0.7	3.0	2.1	0.3	0.7	0.61	6.83
Sulphate	mg/L	20.8	9.1	19.7	9.6	18.9	14.6	35.7
Nutrients and Chlorophyll a								
Total ammonia as NH4	mg N/L	0.01	0.01	0.33	0.29	< 0.01	0.02	0.99
Un-Ionized Ammonia, calculated	mg NH3/L	-	-	0.01	< 0.01	< 0.01	< 0.01	0.01
Nitrate	mg N/L	0.01	0.04	0.01	-	-	< 0.01	-
Nitrite	mg N/L	0.01	0.01	0.01	-	-	< 0.01	-
Total nitrogen	mg N/L	0.4	0.5	0.8	0.66	0.53	0.5	1.4
Total phosphorus	mg/L	0.01	0.03	0.02	< 0.01	< 0.04	< 0.01	< 0.01
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01
Total Metals								
Aluminum	mg/L	0.015	0.057	0.282	0.203	0.049	0.009	0.868
Antimony	mg/L	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.0005	0.0066	0.0111	0.0077	0.0079	0.0058	0.0229
Barium	mg/L	0.023	0.213	0.105	0.0496	0.1408	0.1064	0.125
Beryllium	mg/L	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	0.00002	0.00007	0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.001	0.002	0.005	0.0054	0.0019	< 0.0006	0.014
Copper	mg/L	0.001	0.001	0.002	0.0016	0.0009	< 0.0005	0.005
Iron	mg/L	0.18	0.41	1.13	0.80	0.65	0.47	2.60
Lead	mg/L	0.0003	0.0003	0.0002	< 0.0003	< 0.0003	< 0.00017	< 0.00017
Lithium	mg/L	0.005	0.011	0.009	0.009	0.013	0.009	0.006
Manganese	mg/L	0.017	0.392	0.432	0.8112	0.2619	0.1049	0.548
Mercury	mg/L	0.00001	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	0.0044	0.0100	0.0068	-	-	0.0068	-
Selenium	mg/L	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sodium	mg/L	1.29	3.18	2.34	1.06	2.90	2.25	3.16
Strontium	mg/L	0.110	0.479	0.309	0.231	0.396	0.300	0.309
Thallium	mg/L	0.0002	0.0002	0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L	0.02	0.01	0.02	0.01	< 0.01	< 0.01	0.05
Uranium	mg/L	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	0.0005	0.0005	0.0012	0.0006	< 0.0005	< 0.0005	0.0032
Zinc	mg/L	0.002	0.007	0.003	0.004	< 0.001	< 0.001	0.005
Dissolved Metals								
Aluminum	mg/L	0.005	0.001	0.006	< 0.006	< 0.006	< 0.006	< 0.006
Antimony	mg/L	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.0005	0.0051	0.0050	0.0033	0.0056	0.0036	0.0076
Barium	mg/L	0.0190	0.2079	0.1022	0.0347	0.1439	0.1073	0.1229

Beryllium	mg/L	*0.0005*	*0.0005*	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	*0.00002*	*0.00004*	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.0006*	*0.0006*	*0.0006*	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.0009*	*0.0007*	*0.0008*	0.0012	< 0.0005	< 0.0005	0.0011
Iron	mg/L	*0.01*	*0.17*	*0.06*	0.04	0.06	0.02	0.12
Lead	mg/L	*-*	*0.0003*	*0.0002*	< 0.0003	< 0.0003	< 0.00017	< 0.00017
Lithium	mg/L	*0.005*	*0.011*	*0.009*	0.007	0.013	0.009	0.006
Manganese	mg/L	*0.0007*	*0.3912*	*0.3037*	0.5148	0.2267	0.0612	0.4119
Mercury	mg/L	*0.00001*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0007*	*0.0005*	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	*0.0040*	*0.0092*	*0.0102*	0.0078	0.0095	0.0076	0.0159
Selenium	mg/L	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Strontium	mg/L	*0.105*	*0.496*	*0.306*	0.174	0.413	0.332	0.303
Thallium	mg/L	*0.0002*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L	*0.02*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Uranium	mg/L	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	*0.0005*	*0.0005*	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	*0.001*	*0.006*	*0.001*	0.002	< 0.001	< 0.001	< 0.001

8.5.3.2.6 Lake A45 (ST-WT-13)

In 2020, water from the Lake A45 (ST-WT-13) was sampled on a monthly bases during open water as per the requirements in the NWB Water License (sampling station ST-WT-13 on Figure 4). Monthly samples were collected in July, August, September, and October. There are no applicable license limits. Results are presented in Table 8-51. The Whale Tail South Channel construction began in January 2020 and was completed in April 2020. Flow monitoring is conducted monthly, flows are presented in Table 8-52.

Table 8-51 Whale Tail 2020 Lake A45 Water Quality Monitoring (ST-WT-13)

ST-WT-13	Unit	*Annual Average*		7/26/2020	8/9/2020	9/6/2020	10/4/2020
Parameter		*2019**	*2020*				
Field Measured							
Temperature	°C	*6.1*	*5.8*	13.2	20.5	7.0	2.2
pH	-	*7.40*	*7.50*	8.40	7.45	7.43	7.52
Conductivity	uS/cm	*22.7*	*52.3*	77.3	44.6	32.2	94.8
Dissolved oxygen	mg/L	*11.29*	*11.20*	10.38	8.44	10.83	11.73
Turbidity	NTU	*1.00*	*1.60*	7.35	0.79	1.42	2.57
Conventional Parameters							
TSS	mg/L	*2*	*3*	24	1	4	1
Major Ions							
Sulphate	mg/L	*1.3*	*3.5*	7.9	1.4	1.6	4.5
Total Metals							
Aluminum	mg/L	*0.010*	*0.047*	0.17	0.038	0.015	0.007
Arsenic	mg/L	*0.0005*	*0.0034*	0.0103	0.0046	0.0008	< 0.0005
Copper	mg/L	*0.0005*	*0.0011*	0.0033	< 0.0005	< 0.0005	< 0.0005
Lead	mg/L	*0.0003*	*0.0002*	< 0.0003	< 0.00017	< 0.00017	< 0.00017
Nickel	mg/L	*0.0005*	*0.0010*	0.0025	0.0012	< 0.0005	< 0.0005
Zinc	mg/L	*0.001*	*0.001*	0.001	< 0.001	< 0.001	< 0.001

* Prior to Whale Tail South Channel construction

Table 8-52 Whale Tail South Channel Flow 2020

Month-Year	Total Monthly Flow (m^3)
Jan-20	-
Feb-20	-
Mar-20	-
Apr-20	-
May-20	-
Jun-20	1,405,027
Jul-20	1,371,267
Aug-20	457,532
Sep-20	454,788
Oct-20	206,797
Nov-20	65,748
Dec-20	0
Total	**3,961,159**

8.5.3.2.7 Lake A16 outlet (ST-WT-14)

In 2020, water from the Lake A16 outlet (ST-WT-14) was sampled in June, July, August and September during open water as per the monthly 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 8-53.

8.5.3.2.8 Lake A15 (ST-WT-15)

In 2020, water from the Lake A15 (ST-WT-15) was sampled in June, July, August and September during open water as per the monthly 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 8-54.

Table 8-53 Whale Tail 2020 Lake A16 Outlet Water Quality Monitoring (ST-WT-14)

ST-WT-14	Unit	*Annual Average*			6/5/2020	7/28/2020	8/3/2020	9/17/2020
Parameter		*2018*	*2019*	*2020*				
Field Measured								
pH	-	*6.68*	*6.87*	*7.28*	6.49	7.61	7.37	7.64
Conductivity	uS/cm	*57*	*75*	*203*	457	117.2	113.8	123.8
Dissolved oxygen	mg/L	*10.42*	*11.19*	*9.90*	8.26	9.39	9.22	12.73
Turbidity	NTU	*0.29*	*0.50*	*0.64*	0.5	0.72	0.53	0.81
Conventional Parameters								
Hardness	mg CaCO3/L	*19*	*22*	*87*	198	46	47	55
Total alkalinity, as CaCO3	mg CaCO3/L	*7*	*10*	*49*	47	50	49	50
TSS	mg/L	*1*	*1*	*2*	2	< 1	1	3
TDS	mg/L	*38*	*50*	*142*	334	76	76	82
Total organic carbon	mg/L	*1*	*2*	*3*	5.1	2.6	1.9	2
Dissolved organic carbon	mg/L	*1*	*2*	*3*	5.5	2.2	2	3.3
Major Ions								
Carbonate	mg CaCO3/L	*2*	*2*	*4*	< 2	< 5	< 5	< 5
Bicarbonate	mg CaCO3/L	*7*	*10*	*49*	47	50	49	50
Chloride	mg/L	*10.8*	*11.7*	*37.5*	88.1	24.7	18.4	18.7
Reactive silica	mg/L	*-*	*-*	*3.50*	9.81	1.02	1.16	2.02
Sulphate	mg/L	*4.3*	*5.0*	*19.1*	37.6	13	12.5	13.3
Nutrients and Chlorophyll a								
Total ammonia as NH4	mg N/L	*0.01*	*0.03*	*0.03*	0.03	< 0.01	0.02	0.05
Un-Ionized Ammonia, calculated	mg NH3/L	*-*	*-*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg N/L	*0.01*	*0.01*	*0.56*	1.08	0.43	0.18	0.54
Nitrite	mg N/L	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Total nitrogen	mg N/L	*0.11*	*0.26*	*0.27*	0.56	0.18	0.21	0.11
Total phosphorus	mg/L	*0.01*	*0.01*	*0.02*	< 0.01	0.046	< 0.01	< 0.01
Total orthophosphate (as phosphorus)	mg/L	*0.01*	*0.01*	*0.02*	0.01	0.02	0.02	< 0.01
Total Metals								
Aluminum	mg/L	*0.005*	*0.008*	*0.006*	< 0.006	< 0.006	< 0.006	< 0.006
Antimony	mg/L	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	*0.0005*	*0.0005*	*0.0006*	< 0.0005	0.0007	0.0008	< 0.0005
Barium	mg/L	*0.0093*	*0.0076*	*0.0473*	0.1276	0.0205	0.0198	0.0212
Beryllium	mg/L	*0.0005*	*0.0005*	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	*0.00002*	*0.00002*	*0.00003*	0.00007	< 0.00002	< 0.00002	< 0.00002
Calcium	mg/L	*5.7*	*6.8*	*25.4*	58.6	13.5	13.8	15.7
Chromium	mg/L	*0.0006*	*0.0006*	*0.0012*	0.0029	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.0005*	*0.0007*	*0.0013*	0.0013	0.0026	< 0.0005	0.0008
Iron	mg/L	*0.01*	*0.02*	*0.03*	0.04	0.02	< 0.01	0.03
Lead	mg/L	*0.0003*	*0.0003*	*0.0003*	0.0003	< 0.0003	< 0.0003	< 0.00017
Lithium	mg/L	*0.005*	*0.005*	*0.006*	0.007	< 0.005	< 0.005	< 0.005

ST-WT-14	Unit	Annual Average			6/5/2020	7/28/2020	8/3/2020	9/17/2020
Parameter		2018	2019	2020				
Magnesium	mg/L	1.3100	1.5767	5.6525	12.56	3.06	3.15	3.84
Manganese	mg/L	0.0007	0.0012	0.0084	0.0204	0.0047	0.001	0.0074
Mercury	mg/L	0.00001	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001	0.00002
Molybdenum	mg/L	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	0.0012	0.0011	0.0029	0.0092	0.0008	0.0007	0.0008
Potassium	mg/L	0.7	1.2	4.4	8.19	2.8	2.97	3.5
Selenium	mg/L	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sodium	mg/L	0.05	0.86	3.29	7.14	1.78	1.91	2.31
Thallium	mg/L	0.0002	0.0002	0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Uranium	mg/L	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	0.001	0.012	0.001	0.002	< 0.001	< 0.001	< 0.001
Dissolved Metals								
Aluminum	mg/L	0.005	0.001	0.006	< 0.006	< 0.006	< 0.006	< 0.006
Antimony	mg/L	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Barium	mg/L	0.0093	0.0071	0.0421	0.1188	0.0151	0.0183	0.016
Beryllium	mg/L	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chromium	mg/L	0.0000	0.0006	0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.0006	0.0006	0.0007	0.0008	0.0008	< 0.0005	< 0.0005
Iron	mg/L	0.00	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Lead	mg/L	0.0100	0.0011	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.00017
Lithium	mg/L	0.005	0.005	0.005	0.006	< 0.005	< 0.005	< 0.005
Manganese	mg/L	0.0005	0.0005	0.0047	0.0151	< 0.0005	< 0.0005	0.0028
Mercury	mg/L	0.00001	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	0.0005	0.0008	0.0025	0.0068	0.0019	< 0.0005	0.0006
Selenium	mg/L	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Thallium	mg/L	0.0002	0.0002	0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Uranium	mg/L	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	0.001	0.002	0.002	0.003	< 0.001	< 0.001	< 0.001

Table 8-54 Whale Tail 2020 Lake A15 Outlet Water Quality Monitoring (ST-WT-15)

ST-WT-15	Unit	*Annual Average*			6/5/2020	7/28/2020	8/3/2020	9/17/2020
Parameter		***2018***	***2019***	***2020***				
Field Measured								
pH	-	*6.75*	*6.88*	*7.44*	6.83	7.63	7.63	7.66
Conductivity	uS/cm	*58*	*73*	*146*	233	110.4	112.5	127.5
Dissolved oxygen	mg/L	*11*	*11*	*11*	10.89	9.59	9	12.65
Turbidity	NTU	*-*	*0.76*	*0.48*	0.35	0.58	0.49	0.49
Conventional Parameters								
Hardness	mg CaCO3/L	*20*	*22*	*58*	92	44	44	50
Total alkalinity, as CaCO3	mg CaCO3/L	*7*	*10*	*43*	28	49	47	48
TSS	mg/L	*1*	*1*	*2*	1	< 1	2	3
TDS	mg/L	*39*	*48*	*100*	171	72	74	82
Total organic carbon	mg/L	*1.5*	*1.6*	*2.4*	2.9	2.5	1.8	2.2
Dissolved organic carbon	mg/L	*1.5*	*1.6*	*2.4*	2.9	2.4	1.5	2.6
Carbonate	mg CaCO3/L	*2*	*2*	*4*	< 2	< 5	< 5	< 5
Bicarbonate	mg CaCO3/L	*7*	*10*	*43*	28	49	47	48
Major Ions								
Chloride	mg/L	*10.9*	*10.7*	*22.9*	42.1	18.2	13.1	18.1
Reactive silica	mg/L	*-*	*-*	*2.26*	5.07	0.84	1.17	1.96
Sulphate	mg/L	*3*	*5*	*14*	20.5	11	11.4	12.1
Nutrients and Chlorophyll a								
Total ammonia as NH4	mg N/L	*0.02*	*0.01*	*0.01*	0.02	< 0.01	< 0.01	0.01
Nitrate	mg N/L	*0.04*	*0.02*	*0.59*	0.95	0.26	0.49	0.64
Nitrite	mg N/L	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Total nitrogen	mg N/L	*0.07*	*0.28*	*0.25*	0.24	0.40	0.22	0.13
Total phosphorus	mg/L	*0.01*	*0.01*	*0.02*	< 0.01	0.04	< 0.01	< 0.01
Total orthophosphate (as phosphorus)	mg/L	*0.01*	*0.01*	*0.02*	0.01	< 0.01	0.03	0.01
Total Metals								
Aluminum	mg/L	*0.005*	*0.005*	*0.006*	< 0.006	< 0.006	< 0.006	< 0.006
Antimony	mg/L	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	*0.0005*	*0.0005*	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Barium	mg/L	*0.0081*	*0.0071*	*0.0261*	0.0487	0.0194	0.0192	0.017
Beryllium	mg/L	*0.0005*	*0.0005*	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	*0.00002*	*0.00002*	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Calcium	mg/L	*5.9*	*6.5*	*16.7*	26.6	12.8	13.0	14.3
Chromium	mg/L	*0.0006*	*0.0009*	*0.0011*	0.0027	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.0005*	*0.0006*	*0.0007*	0.0012	0.0005	< 0.0005	< 0.0005
Iron	mg/L	*0.01*	*0.02*	*0.02*	0.02	0.01	< 0.01	0.02
Lead	mg/L	*0.0003*	*0.0003*	*0.0003*	< 0.0003	< 0.0003	< 0.0003	< 0.00017
Lithium	mg/L	*0.005*	*0.005*	*0.005*	< 0.005	< 0.005	< 0.005	< 0.005
Magnesium	mg/L	*1.44*	*1.49*	*3.85*	6.27	2.83	2.91	3.37

ST-WT-15	Unit	*Annual Average*			6/5/2020	7/28/2020	8/3/2020	9/17/2020
Parameter		*2018*	*2019*	*2020*				
Manganese	mg/L	*0.001*	*0.001*	*0.002*	0.0022	0.001	< 0.0005	0.0035
Mercury	mg/L	*0.00001*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0005*	*0.0005*	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	*0.0009*	*0.0010*	*0.0016*	0.0043	0.0007	0.0009	0.0005
Potassium	mg/L	*0.71*	*1.16*	*3.25*	4.61	2.66	2.59	3.12
Selenium	mg/L	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Sodium	mg/L	*0.05*	*0.88*	*2.29*	3.60	1.74	1.81	1.99
Thallium	mg/L	*0.0002*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Uranium	mg/L	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	*0.0005*	*0.0005*	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	*0.001*	*0.001*	*0.001*	0.001	< 0.001	< 0.001	< 0.001
Dissolved Metals								
Aluminum	mg/L	*0.005*	*0.001*	*0.006*	< 0.006	< 0.006	< 0.006	< 0.006
Antimony	mg/L	*0.0001*	*0.0001*	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	*0.0005*	*0.0005*	*0.0006*	< 0.0005	0.001	< 0.0005	< 0.0005
Barium	mg/L	*0.0083*	*0.0059*	*0.0246*	0.0488	0.0199	0.0136	0.016
Beryllium	mg/L	*0.0005*	*0.0005*	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Chromium	mg/L	*0.0000*	*0.0006*	*0.0006*	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.0007*	*0.0006*	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Iron	mg/L	*0.00*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Lead	mg/L	*0.0100*	*0.0003*	*0.0003*	< 0.0003	< 0.0003	< 0.0003	< 0.00017
Lithium	mg/L	*0.005*	*0.005*	*0.005*	< 0.005	< 0.005	< 0.005	< 0.005
Manganese	mg/L	*0.0005*	*0.0005*	*0.0013*	0.0009	0.0031	< 0.0005	< 0.0005
Mercury	mg/L	*0.00001*	*0.00001*	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0005*	*0.0005*	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	*0.0010*	*0.0010*	*0.0016*	0.0031	0.0013	< 0.0005	0.0014
Selenium	mg/L	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Thallium	mg/L	*0.0002*	*0.0002*	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L	*0.01*	*0.01*	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01
Uranium	mg/L	*0.001*	*0.001*	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	*0.0005*	*0.0005*	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	*0.001*	*0.001*	*0.001*	0.001	< 0.001	< 0.001	< 0.001

8.5.3.2.9 Whale Tail Dike Seepage (ST-WT-17)

As discussed in Section 8.5.8.2.2 below, during dewatering operations of the Whale Tail North Basin, a small inflow of water was observed out of the downstream toe of Whale Tail Dike (WTD) in a low spot. In 2020, Agnico continued to manage water from WTD seepage as part of the dewatering of the Whale Tail North Basin. Once the dewatering of the Whale Tail North Basin was complete in 2020, the seepage water was pumped to the Whale Tail Attenuation Pond and managed as part of this infrastructure.

Water quality sampling was conducted at a minimum on a monthly basis as per the seepage requirements of the NWB water license in 2020. Sample results are presented in Table 8-55. See Figure 4 for the location of ST-WT-17. Refer to Section 8.5.8.2.2 for details on the Whale Tail Dike seepage regarding consequence and mitigation measure in place.

8.5.3.2.10 Whale Tail South Transfer (ST-WT-26)

No water transfer from Whale Tail South to Mammoth lake was not done in 2020 as the Whale Tail South Channel construction was completed in April 2020 which facilitates the passive flow of water from Whale Tail South to Mammoth Lake.

Table 8-55 Whale Tail Dike Seepage 2020 Water Quality Monitoring (ST-WT-17)

ST-WT-17	Unit	*Annual Average*		1/5/2020	1/13/2020	1/20/2020	1/27/2020	2/3/2020	2/10/2020	2/24/2020	3/1/2020	3/8/2020	3/16/2020	3/22/2020	3/30/2020	4/6/2020	5/4/2020	6/1/2020	6/7/2020	6/14/2020	6/21/2020	6/28/2020
Parameter		2019	*2020*																			
Field Measured																						
Temperature	°C	6.6	*3.5*	0.5	1.1	0.1	0.1	1.22	1	0	0	0.3	0.1	0.3	0.1	0.2	0.8	1.6	1.7	4.2	5.1	5.4
pH	-	8.10	*9.65*	8.99	9.31	9.37	9.51	9.34	9.42	9.31	9.31	9.28	9.67	9.83	9.47	9.45	9.34	9.21	9.1	9.46	9.21	9.49
Conductivity	uS/cm	127	*3920*	152.8	157.9	148.5	161.7	162.5	156.1	180.8	195.8	160.5	215.8	176.6	191	183	179.3	214.7	164.9	161.4	149.3	141.4
Dissolved oxygen	mg/L	11.39	*12.13*	13.9	-	11.58	11.09	11.69	11.25	10.64	13.75	11.78	12.81	10.59	10.89	11.07	10.82	9.89	10.03	9.95	9.11	7.96
Turbidity	NTU	22	*5*	2.12	7.4	6.37	1.38	3.67	6	2.05	11.6	2.59	5.2	1.82	1.37	1.18	1.94	12.3	11.8	20.6	16.2	4.66
Conventional Parameters																						
Hardness	mg CaCO3/L	44	*64*	55	65	71	70	66	57	62	76	71	71	60	58	69	70	68	71	69	72	71
Total alkalinity, as CaCO3	mg CaCO3/L	30	*56*	56	59	61	61	62	62	65	73	71	80	80	37	40	39	44	40	45	43	44
TSS	mg/L	17	*5*	4	8	11	3	2	7	2	6	4	6	< 1	2	2	1	18	15	23	7	3
TDS	mg/L	87	*87*	96	-	89	93	88	87	98	94	107	1	109	120	114	123	128	123	125	91	91
Major Ions																						
Chloride	mg/L	18	*16*	16.9	17.8	18.6	18.8	17.3	17.5	20	24	18.4	19.6	19.9	21.1	19.9	18	19.1	18.8	17.9	15.2	12
Fluoride	mg/L	0.10	*0.11*	0.14	0.13	0.11	0.11	0.12	0.12	0.12	0.14	0.1	0.11	0.11	0.09	0.12	0.1	0.1	0.11	0.09	0.09	0.11
Sulphate	mg/L	7.3	*9.8*	9.8	10.2	9.9	17.2	16.8	8.5	12.9	10	8.1	9.3	8.1	13.3	12.1	9.6	11.7	11.2	13.3	11.5	9.9
Nutrients and Chlorophyll a																						
Total ammonia as NH4	mg-N/L	0.03	*0.021*	0.01	< 0.01	0.03	0.01	0.03	0.02	0.03	0.04	< 0.01	0.02	< 0.01	< 0.01	0.03	< 0.01	0.02	0.02	0.04	0.05	0.03
Un-Ionized Ammonia, calculated	mg-N/L	-	*0.01*	< 0.01	< 0.01	-	< 0.01	0.02	< 0.01	0.01	0.02	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	0.01
Nitrate	mg-N/L	0.12	*0.21*	0.14	0.13	0.15	0.16	0.17	0.16	0.22	0.18	0.18	0.31	0.18	0.22	0.25	0.21	0.39	0.5	0.27	0.31	0.31
Nitrite	mg-N/L	0.02	*0.02*	0.01	0.01	< 0.01	0.01	0.01	< 0.01	< 0.01	0.01	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	0.01
Total phosphorus	mg/L	0.02	*0.02*	0.08	0.04	0.04	0.03	0.03	0.02	< 0.01	< 0.01	< 0.01	0.02	< 0.01	0.02	0.02	< 0.01	0.01	< 0.01	< 0.01	0.01	0.03
Total orthophosphate (as phosphorus)	mg/L	0.04	*0.05*	0.03	0.02	0.02	0.01	0.02	0.02	0.02	0.13	0.01	0.02	0.01	0.01	0.02	< 0.01	0.03	0.03	0.04	0.02	0.01
Total Metals																						
Aluminum	mg/L	0.31	*0.11*	0.04	0.198	0.16	0.048	0.08	0.111	0.046	0.261	0.09	0.063	0.027	0.046	0.014	0.041	0.255	0.191	0.361	0.339	0.117
Arsenic	mg/L	0.011	*0.011*	0.0107	0.0159	0.0132	0.0139	0.0176	0.0123	0.010	0.0143	0.0115	0.0146	0.0109	0.009	0.0118	0.0085	0.0087	0.0112	0.0136	0.0134	0.0149
Barium	mg/L	0.026	*0.031*	0.034	0.0347	0.0356	0.0339	0.0338	0.0317	0.0339	0.0451	0.0421	0.0284	0.034	0.0375	0.0425	0.0418	0.0449	0.0428	0.0427	0.0329	0.0274
Beryllium	mg/L	-	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	-	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	0.00005	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00011	< 0.00002	< 0.00002
Chromium	mg/L	0.003	*0.002*	0.0008	0.0024	0.0026	0.0036	0.0012	< 0.0006	0.001	0.0031	0.0025	0.0019	0.0015	0.0012	0.0022	0.0012	0.0055	0.0047	0.0083	0.0076	0.0011
Copper	mg/L	0.009	*0.002*	0.0018	0.0023	0.0022	0.0016	0.0019	0.0021	0.0018	0.0138	0.0023	0.0017	0.0019	0.0015	0.0016	0.0024	0.0015	0.002	0.0026	0.0015	0.0016
Iron	mg/L	0.77	*0.23*	0.11	0.49	0.25	0.11	0.12	0.25	0.15	0.45	0.18	0.14	0.1	0.12	0.1	0.12	0.51	0.44	0.75	0.67	0.22
Lead	mg/L	0.0004	*0.0003*	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0006	< 0.0003	< 0.0003	< 0.0003
Lithium	mg/L	-	*0.005*	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Manganese	mg/L	0.078	*0.044*	0.0208	0.0342	0.0336	0.0237	0.0247	0.0304	0.0232	0.0348	0.0288	0.0226	0.0205	0.0192	0.0255	0.0219	0.042	0.0398	0.049	0.0538	0.0596
Mercury	mg/L	0.00001	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00003	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.003	*0.002*	0.002	0.0019	0.0018	0.0026	0.0028	0.003	0.0022	0.0027	0.0027	0.002	0.0023	0.0028	0.0023	0.0019	0.002	0.0021	0.0022	0.0012	0.0016
Nickel	mg/L	0.003	*0.002*	0.0023	0.0027	0.002	0.0017	0.0015	0.0015	0.0013	0.0018	0.0016	0.0012	0.0009	0.001	0.0011	0.0015	0.0036	0.0032	0.005	0.0048	0.0016
Selenium	mg/L	0.001	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	0.0005	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Zinc	mg/L	0.002	*0.004*	0.002	< 0.001	0.003	0.002	0.002	0.003	0.003	0.059	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.005	< 0.001	0.002	0.005	< 0.001	0.003

ST-WT-17	Unit	*Annual Average*		7/5/2020	7/12/2020	7/19/2020	7/26/2020	8/2/2020	8/9/2020	8/16/2020	8/23/2020	8/30/2020	9/6/2020	9/13/2020	9/20/2020	9/27/2020	10/4/2020	10/11/2020	10/18/2020	10/25/2020	11/8/2020	11/16/2020	11/22/2020	11/29/2020	12/20/2020
Parameter		**2019**	*2020*																						
Field Measured																									
Temperature	°C	6.6	*3.5*	8.3	6.4	6	7.4	12.4	12	9.8	10.3	9	7.9	5.8	6.2	5.7	1.7	3.1	2.6	2	0.6	0.3	0.4	0.2	0
pH	-	8.10	*9.65*	9.13	9.5	9.61	9.68	9.58	9.6	9.61	9.76	9.89	10.06	10.09	10.08	10.15	10.17	11.25	10.15	10.13	10.08	9.67	9.9	9.89	9.54
Conductivity	uS/cm	127	*3920*	41.2	136.2	143.5	134.8	1343	130.6	132.9	129.1	127.4	135.3	136.2	153500	140	169.5	137.5	137.1	142.3	191.8	119.9	113.4	115.5	128.4
Dissolved oxygen	mg/L	11.39	*12.13*	9.91	8.32	9.25	76.9	7.71	8.2	9.03	9.31	9.08	9.86	9.52	9.96	10.86	10.62	10.06	11.03	11.8	10.59	12.69	9.98	9.86	11.93
Turbidity	NTU	22	*5*	1.53	1.68	1.86	1.31	2.07	2.57	2.26	1.85	2.96	6.36	7.81	8.39	11.6	9.9	9.1	6.68	3.56	5.72	5.92	2.69	6.43	2.22
Conventional Parameters																									
Hardness	mg CaCO3/L	44	*64*	61	59	62	63	70	62	61	63	67	61	70	74	62	76	56	57	61	53	64	55	53	55
Total alkalinity, as CaCO3	mg CaCO3/L	30	*56*	43	43	43	43	56	58	58	59	52	60	61	61	61	61	62	62	69	61	62	62	64	34
TSS	mg/L	17	*5*	8	< 1	3	2	2	2	1	4	2	3	1	10	8	3	3	**15**	3	4	2	4	-	4
TDS	mg/L	87	*87*	87	88	91	85	89	87	88	82	81	85	84	90	86	86	67	**5**	6	81	83	81	90	100
Major Ions																									
Chloride	mg/L	18	*16*	14.9	10.4	13.9	13.4	13.9	16	12.8	12.8	14.5	13.2	13	12.2	12.7	12.5	12	13	13	13	13.2	13.3	13.9	14.9
Fluoride	mg/L	0.10	*0.11*	0.12	0.1	0.1	0.11	0.12	0.09	0.11	0.1	0.1	0.11	0.11	0.29	0.1	0.11	0.1	0.09	0.1	0.09	0.09	0.09	0.08	0.08
Sulphate	mg/L	7.3	*9.8*	9.7	9	9.4	9	8.8	9.5	6.9	6.8	9.8	8	8.5	9.2	9.9	10.6	8.2	8.5	8.3	7.4	7.6	8.9	7.4	8.4
Nutrients and Chlorophyll a																									
Total ammonia as NH4	mg-N/L	0.03	*0.021*	0.02	< 0.01	0.07	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.04	0.02	< 0.01	0.01	0.04	0.06	0.02	0.02	0.02	< 0.01	0.01
Un-Ionized Ammonia, calculated	mg-N/L	-	*0.01*	< 0.01	< 0.01	0.04	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.03	0.01	< 0.01	< 0.01	0.031	0.047	0.01	0.01	0.01	< 0.01	< 0.01
Nitrate	mg-N/L	0.12	*0.21*	0.21	0.21	0.21	0.08	0.2	0.15	0.16	0.14	0.15	0.18	0.18	0.17	0.15	0.15	0.19	0.19	0.21	0.12	0.22	0.19	0.29	0.34
Nitrite	mg-N/L	0.02	*0.02*	0.01	< 0.01	< 0.01	0.14	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	0.01	0.02	0.01	0.01	< 0.01	< 0.01	0.08	< 0.01	< 0.01	< 0.01	< 0.01
Total phosphorus	mg/L	0.02	*0.02*	< 0.01	< 0.04	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.07	< 0.04	< 0.04	< 0.04	< 0.04	< 0.01	< 0.01	0.03
Total orthophosphate (as phosphorus)	mg/L	0.04	*0.05*	< 0.01	1.3	0.07	0.02	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	0.01	< 0.01	< 0.01	< 0.01	0.01	0.01	0.02	0.02	0.03	< 0.01
Total Metals																									
Aluminum	mg/L	0.31	*0.11*	0.073	< 0.006	0.027	0.034	0.041	0.059	0.034	0.064	0.061	0.151	0.115	0.233	0.166	0.196	0.097	0.124	0.078	0.101	0.15	0.07	0.096	0.042
Arsenic	mg/L	0.011	*0.011*	0.0096	0.0102	0.0129	0.0142	0.0131	0.0113	0.0111	0.0116	0.013	0.0124	0.0134	0.0093	0.0098	0.0101	0.0084	0.0078	0.0069	0.0073	0.0096	0.0081	0.0063	0.0058
Barium	mg/L	0.026	*0.031*	0.0253	0.0253	0.0263	0.0284	0.0348	0.0262	0.0296	0.0271	0.0249	0.0286	0.0299	0.0295	0.0253	0.0287	0.0252	0.0216	0.0298	0.0217	0.0283	0.0248	0.0246	0.0241
Beryllium	mg/L	-	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	-	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	-	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.15	< 0.01	< 0.01	< 0.01	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.002
Cadmium	mg/L	0.00005	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00003	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.003	*0.002*	0.0032	< 0.0006	< 0.0006	< 0.0006	0.0007	< 0.0006	< 0.0006	0.0007	0.0007	< 0.0006	0.0012	0.0015	< 0.0006	0.0008	0.0008	< 0.0006	< 0.0006	0.0019	0.0022	0.0006	0.002	0.0006
Copper	mg/L	0.009	*0.002*	0.001	< 0.0005	0.0021	0.0012	0.0017	0.0012	< 0.0005	0.0012	0.0013	0.0012	0.003	0.002	< 0.0005	0.0018	0.0017	0.0129	0.001	0.0019	0.0032	0.0072	0.0015	0.0006
Iron	mg/L	0.77	*0.23*	0.21	0.08	0.12	0.09	0.11	0.12	0.11	0.14	0.15	0.2	0.27	0.37	0.31	0.36	0.24	0.2	0.14	0.21	0.27	0.14	0.22	0.1
Lead	mg/L	0.0004	*0.0003*	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	0.0005	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	0.0007	< 0.00017	< 0.00017
Lithium	mg/L	-	*0.005*	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.008	< 0.005	< 0.005	< 0.005	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Manganese	mg/L	0.078	*0.044*	0.0562	0.0509	0.0639	0.0534	0.0633	0.0689	0.0605	0.0622	0.0717	0.0633	0.0749	0.0721	0.0638	0.0889	0.053	0.0498	0.0466	0.0331	0.0338	0.0243	0.0244	0.0178
Mercury	mg/L	0.00001	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00002	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.003	*0.002*	0.0011	0.0009	0.0025	0.0018	0.0027	0.0011	0.0027	0.0011	0.0025	0.0023	0.002	0.0014	0.0005	0.0018	0.0013	0.0014	0.0019	0.0015	0.0016	0.0011	0.0011	0.001
Nickel	mg/L	0.003	*0.002*	0.0024	0.0012	0.0014	0.001	0.0016	0.0013	0.001	0.0008	0.0009	0.001	0.0013	0.0012	< 0.0005	0.0013	0.0012	0.0126	0.0007	0.0009	0.002	0.0007	0.0012	0.0009
Selenium	mg/L	0.001	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Silver	mg/L	0.0005	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Zinc	mg/L	0.002	*0.004*	< 0.001	< 0.001	0.002	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	0.002	0.037	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001

8.5.3.2.11 North-East Pond to Nemo Watershed

On August 15th, 2019, Agnico submitted to NWB a request regarding a new water management strategy. The Water Management Plan indicated that non-contact water from the North-East Pond watershed will overflow by gravity toward Nemo Lake once the North-East (NE) Dike is operational. The NE Dike was constructed in Q1 2019 and became operational during freshet of 2019. During a routine inspection in July 2019, it was observed that the topography toward Nemo Lake would not allow water to overflow naturally before overtopping the dike liner. Since then, water was pumped from NE Pond toward the project site adding pressure on dewatering activity.

Agnico pumped water from the NE Pond to the Nemo watershed in 2019 and 2020. Agnico was not expecting any concerns relating to water quality as this is non-contact water from NE Pond. To ensure compliance with the Water License 2AM-WTP1830, Agnico monitored the effluent of the NE Pond for TSS as per Water License Part F Item 7. This water management strategy was approved by the NWB on August 16th, 2019. This system was maintain the water level in NE Pond when required until the fishout and dewatering started.

A total volume of 180,829 m^3 was transferred from to the tundra in the Nemo watershed in 2020. Pumping occurred from June 12 to June 16, June 18 to June 30, July 24 to July 27, and on July 29. Refer to 2020 Migratory Bird Protection Report for a discussion of the water level versus the FEIS (Appendix E of the Wildlife Monitoring Summary Report in Appendix 47). As per Water License Part F Item 7, the effluent from this discharge shall not exceed the maximum authorized concentration grab of 30 mg/L and the maximum authorized monthly mean concentration of 15 mg/L. Result are presented in Table 8-56 below for the discharge to tundra. No non-compliance observed related to this non-contact water transfer.

A fish-out program was conducted as part of the Whale Tail Expansion Project (see Section 8.11) and dewatering of Northeast Sector started in August 2020 and was completed in September 2020 (see Section 8.5.2). A total volume of 146,017 m^3 was pumped to the Whale Tail Attenuation Pond from Lake A47 in 2020. All the dewatering water was managed as part o Whale Tail Attenuation Pond where it was treated in the WTP prior to discharge to Mammoth Lake. The NE Pond become the IVR Pit as part of the Whale Tail Expansion Project in 2020.

8.5.3.2.12 Quarry 1 Discharge

Water from Quarry 1 was discharge from April 13 to April 15 and April 26 to April 29. The water was below the regulatory limits, and discharged back to Mammoth Lake in one permanent diffuser. A total volume of 74,812 m^3 of water from Quarry 1 was discharged during this period.

Agnico monitored the discharged water as per Water License Part F Item 5, as the effluent from this discharge shall not exceed the limits detailed in Table 8-57. No non-compliance were observed. Refer to Section 8.3.2.4 above to the MDMER-EEM monitoring requirement associated with this discharge.

Table 8-56 Whale Tail North-East Pond 2020 Water Quality Monitoring

NE DIKE POND	Unit	*Annual Average*		6/21/2020	7/26/2020
Parameter		*2019*	*2020*		
Field Measured					
Temperature	°C	*9.4*	*13.2*	12.4	13.9
pH	-	*6.8*	*7.3*	7.1	7.42
Conductivity	uS/cm	*1832*	*335*	248	422
Dissolved oxygen	mg/L	*11.02*	*9.29*	8.97	9.61
Turbidity	NTU	*7.62*	*3.96*	4.71	3.21
Conventional Parameters					
TSS	mg/L	*4.17*	*6.25*	4.5*	8

**Internal TSS results done by Agnico Assay Lab*

Table 8-57 Whale Tail Quarry 1 Discharge 2020 Water Quality Monitoring

ST-WT-QUARRY-1	Unit	*Annual Average*		4/13/2020	4/27/2020
Parameter		*2019*	*2020*		
Field Measured					
pH	pH units	*7.09*	*7.37*	7.78	6.95
Conductivity	uS/cm	*498.7*	*951.0*	891.9	1010.0
Dissolved oxygen	mg/L	*23.31*	*11.88*	12.51	11.25
Turbidity	NTU	*10.49*	*6.09*	8.97	3.20
Conventional Parameters					
Total alkalinity, as CaCO3	mg CaCO3/L	*34*	*81*	86	75
Hardness	mg CaCO3/L	*159*	*74*	353	462
Carbonate (CO3)	mg CaCO3/L	*3*	*2*	< 2	< 2
Bicarbonate	mg CaCO3/L	*35*	*81*	86	75
TDS	mg/L	*275*	*659*	625	692
TSS	mg/L	*9*	*6*	8	4
Total organic carbon	mg/L	*3.5*	*2.6*	2.3	2.8
Dissolved organic carbon	mg/L	*4.3*	*2.4*	2.1	2.6
Major Ions					
Chloride	mg/L	*58.2*	*187.4*	165.3	209.4
Cyanide	mg/L	*0.008*	*0.031*	0.035	0.027
Fluoride	mg/L	*0.07*	*0.16*	0.20	0.12
Sulfate	mg/L	*49.3*	*38.4*	17.7	59.1
Nutrients and Chlorophyll a					
Total ammonia as NH4	mg-N/L	*0.83*	*2.60*	3.53	1.67
Un-Ionized Ammonia, calculated	mg-N/L	*0.01*	*0.04*	0.06	0.01
Nitrate	mg-N/L	*5.91*	*8.27*	5.63	10.9
Nitrite	mg-N/L	*0.17*	*0.11*	0.14	0.07
Total nitrogen	mg/L	*1.05*	*1.98*	3.3	0.66
Total phosphorus	mg/L	*0.02*	*0.01*	< 0.01	< 0.01
Total orthophosphate (as phosphorus)	mg/L	*0.03*	*0.02*	0.03	< 0.01
General Organics					
Total oil and grease	mg/L	*1.11*	*1*	< 1	< 1
Total Metals					
Aluminum	mg/L	*0.3059*	*0.189*	0.162	0.215
Antimony	mg/L	*0.0019*	*0.0021*	0.0022	0.002
Arsenic	mg/L	*0.0098*	*0.0311*	0.0457	0.0164
Barium	mg/L	*0.0910*	*0.2532*	0.2348	0.2715
Beryllium	mg/L	*0.0006*	*0.0005*	< 0.0005	< 0.0005
Boron	mg/L	*0.012*	*0.01*	< 0.01	< 0.01
Cadmium	mg/L	*0.00003*	*0.00002*	< 0.00002	< 0.00002
Chromium	mg/L	*0.0034*	*0.0033*	0.0046	0.0019
Copper	mg/L	*0.0031*	*0.0062*	0.0082	0.0042
Iron	mg/L	*0.54*	*0.22*	0.29	0.15

ST-WT-QUARRY-1	Unit	*Annual Average*		4/13/2020	4/27/2020
Parameter		*2019*	*2020*		
Lead	mg/L	*0.0004*	*0.0003*	< 0.0003	< 0.0003
Manganese	mg/L	*0.2327*	*0.4661*	0.3755	0.5566
Mercury	mg/L	*0.00002*	*0.00001*	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0109*	*0.0164*	0.0128	0.0199
Nickel	mg/L	*0.0126*	*0.0166*	0.0151	0.018
Selenium	mg/L	*0.001*	*0.001*	< 0.001	0.001
Strontium	mg/L	*0.250*	*0.502*	0.466	0.537
Thallium	mg/L	*0.0003*	*0.0002*	< 0.0002	< 0.0002
Tin	mg/L	*0.001*	*0.001*	< 0.001	< 0.001
Titanium	mg/L	*0.02*	*0.01*	0.01	0.01
Uranium	mg/L	*0.004*	*0.007*	0.003	0.01
Vanadium	mg/L	*0.0014*	*0.0019*	0.0027	0.0010
Zinc	mg/L	*0.003*	*0.003*	< 0.001	0.004
Dissolved Metals					
Aluminum	mg/L	*0.006*	*0.006*	< 0.006	0.006
Antimony	mg/L	*0.0018*	*0.0020*	0.0018	0.0021
Arsenic	mg/L	*0.0064*	*0.0282*	0.0434	0.0130
Barium	mg/L	*0.0835*	*0.22360*	0.2192	0.2280
Beryllium	mg/L	*0.0006*	*0.0005*	< 0.0005	< 0.0005
Boron	mg/L	*0.01*	*0.01*	< 0.01	< 0.01
Cadmium	mg/L	*0.00008*	*0.00003*	< 0.00002	0.00004
Chromium	mg/L	*0.0008*	*0.0006*	< 0.0006	< 0.0006
Copper	mg/L	*0.0023*	*0.0051*	0.0061	0.0040
Iron	mg/L	*0.03*	*0.01*	< 0.01	0.01
Lead	mg/L	*0.0003*	*0.0003*	< 0.0003	< 0.0003
Manganese	mg/L	*0.1858*	*0.4383*	0.3830	0.4935
Mercury	mg/L	*0.00002*	*0.00001*	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0105*	*0.0159*	0.0133	0.0184
Nickel	mg/L	*0.0099*	*0.0139*	0.0119	0.0159
Selenium	mg/L	*0.001*	*0.001*	< 0.001	< 0.001
Strontium	mg/L	*0.233*	*0.463*	0.442	0.484
Thallium	mg/L	*0.0007*	*0.0002*	< 0.0002	< 0.0002
Tin	mg/L	*0.004*	*0.001*	< 0.001	< 0.001
Titanium	mg/L	*0.01*	*0.01*	< 0.01	< 0.01
Uranium	mg/L	*0.003*	*0.006*	0.003	0.009
Vanadium	mg/L	*0.0011*	*0.0013*	0.0019	0.0006
Zinc	mg/L	*0.002*	*0.001*	< 0.001	0.001

8.5.3.2.13 Whale Tail Attenuation Pond Discharge

8.5.3.2.13.1 Mammoth Lake (ST-WT-2 and ST-WT-2a)

There are two submerged diffusers to facilitate discharge from the Whale Tail Attenuation Pond to Mammoth Lake, the East and West Diffusers. As per Water Licence 2AM-WTP1830, the discharge from the East and West diffusers are to be sampled weekly during discharge.

The West diffuser sampling station is ST-WT-2 and discharged occurred from May 20th to 28th, June 14th to 20th, June 23rd to 26th, August 23rd to September 20th. A total volume of 469,513 m^3 was discharged. The results for ST-WT-2 are provided in Table 8-58. There were no exceedances of Water Licence criteria in 2020.

The East diffuser sampling station is ST-WT-2a and discharge occurred June 17th to July 5th, July 7th to July 23rd, July 25th to August 5th, August 7th to September 13th, and September 15th to October 7th. The total volume of water discharge via this diffuser in 2020 was 1,161,165 m^3. The results for ST-WT-2a are provided in Table 8-59. There were no exceedances of Water Licence criteria in 2020.

8.5.3.2.13.2 Whale Tail South (ST-WT-24 and ST-WT-24b)

In 2020, water from Whale Tail Attenuation Pond was discharge back to Whale Tail South. As per Water Licence 2AM-WTP1830 the discharge are sampled on a weekly bases during discharge.

The temporary diffuser sampling station is ST-WT-24a and discharge from this diffuser occurred on May 28th to June 16th and October 12th to November 1st. A total volume of 412,165 m^3 was discharged. Results from ST-WT-24a are presented in Table 8-60. There were no Water Licence criteria exceedance in 2020.

The permanent diffuser sampling station is ST-WT-24b and was discharging from November 6th to December 2nd, December 5th to December 14th, and December 27th to December 31st. A total volume of 341,420 m^3 was discharged. The results from ST-WT-24b are provided in Table 8-61. There were no Water Licence exceedances in 2020 however one weekly sample was missed during the week of December 13th to 19th. The regulatory sample was planned for December 14th; however the discharge was stopped early in the morning (2:00am) and remained off for the week, therefore the sample was not collected. See Section 11.6 for a completed explanation.

Table 8-58 Whale Tail Attenuation Pond Discharge to Mammoth Lake West Diffuser (ST-WT-2)

ST-WT-2 Parameter	MAX GRAB	MONTHLY MEAN	Unit	*Annual Average*	5/25/2020	6/14/2020	6/23/2020	6/25/2020	8/24/2020	9/1/2020	9/7/2020	9/14/2020	9/20/2020
Field Measured													
Temperature			°C	*4.4*	0.7	2.5	4.1	3.7	8.4	7.4	4.9	3.6	4
pH			-	*6.93*	7.22	6.99	6.58	6.73	6.79	6.94	7.11	7.03	6.96
Conductivity			uS/cm	*442*	462.7	262	350	338	402	433	424	476	834
Turbidity			NTU	*2.36*	12.8	1.01	1.28	1.01	0.59	1	1.54	1.07	0.92
Conventional Parameters													
Hardness			mg CaCO3/L	*197*	163	79	145	165	203	200	198	220	399
Total alkalinity, as CaCO3			mg CaCO3/L	*44*	53	24	34	31	48	52	50	52	50
Total suspended solids	30	15	mg/L	*6*	8	2	7	7	5	4	10	4	< 1
Total organic carbon			mg/L	*3*	2.9	5	< 0.2	3.1	3.8	3.9	4.9	3.7	2.6
Dissolved organic carbon			mg/L	*4*	3	5.6	0.6	2.3	4.6	4.9	5.2	4.5	5
Major Ions													
Carbonate			mg CaCO3/L	*4*	< 2	< 2	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bicarbonate			mg CaCO3/L	*43*	43	24	34	31	48	52	50	52	50
Chloride			mg/L	*77.7*	77.5	37.6	51.1	78.3	66.2	69.6	67.7	70.1	181.2
Reactive Silica			mg/L	*5.82*	8.05	4.15	5.41	5.28	4.84	5.96	5.58	7.05	6.1
Sulphate			mg/L	*49.5*	22.8	35.1	46.1	45.2	51.9	61.5	65.6	77.7	39.5
Nutrients and Chlorophyll a													
Total ammonia as NH4			mg NH3/L	*1.44*	2.01	0.94	2	1.61	1.05	1.03	0.71	1.74	1.83
Un-Ionized Ammonia, calculated			mg N/L	*0.01*	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate			mg N/L	*3.02*	4.13	2.44	3.11	3.32	2.08	2.62	1.46	3.4	4.65
Nitrite			mg N/L	*0.15*	0.07	0.07	0.2	0.23	0.22	0.17	0.1	0.22	0.1
Total nitrogen			mg/L	*1.9*	2.1	1.5	2.7	2	1.8	1.6	1.3	2.1	2
Total phosphorus	0.6	0.3	mg/L	*0.01*	0.01	< 0.01	< 0.01	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total			mg/L	*0.01*	0.02	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

orthophosphate (as phosphorus)													
General Organics													
Total recoverable hydrocarbons	32	16	mg/L	*0.1*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1
Total Metals													
Aluminum	1	0.5	mg/L	*0.027*	0.056	0.018	< 0.006	< 0.006	0.018	0.074	0.033	0.03	< 0.006
Antimony			mg/L	*0.001*	0.0007	0.0022	< 0.0001	0.0015	< 0.0001	0.003	0.0008	0.0017	< 0.0001
Arsenic	0.2	0.1	mg/L	*0.0083*	0.0072	0.0056	0.0078	0.0322	0.0039	0.0039	0.0039	0.0048	0.0055
Barium			mg/L	*0.090*	0.0995	0.0606	0.0606	0.0837	0.0909	0.0842	0.096	0.0939	0.1448
Beryllium			mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron			mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	0.004	0.002	mg/L	*0.00002*	0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Calcium			mg/L	*58.91*	46.4	21.7	41.8	46.9	59	57.7	55.7	64	137
Chromium	0.04	0.02	mg/L	*0.0009*	0.0018	0.0011	< 0.0006	< 0.0006	0.0008	0.0014	0.0007	< 0.0006	< 0.0006
Copper	0.2	0.1	mg/L	*0.0028*	0.005	0.0013	0.0036	0.004	0.0029	0.0045	0.0011	0.0025	0.0006
Iron	2	1	mg/L	*0.53*	0.77	0.16	< 0.01	0.03	0.76	0.5	0.65	0.69	0.66
Lead	0.1	0.05	mg/L	*0.0002*	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017
Lithium			mg/L	*0.009*	0.007	< 0.005	0.007	0.007	0.008	0.007	0.006	0.007	0.024
Magnesium			mg/L	*12.20*	11.51	6.07	10.04	11.66	13.6	13.64	14.4	14.7	14.17
Manganese			mg/L	*0.527*	0.2534	0.2914	0.419	0.5015	0.5111	0.5987	0.7521	0.6387	0.7731
Mercury	0.008	0.004	mg/L	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum			mg/L	*0.004*	0.009	0.0015	0.0018	0.0082	0.0009	0.0048	0.0015	0.0026	0.0026
Nickel	0.5	0.25	mg/L	*0.0207*	0.0073	0.0134	0.0195	0.0246	0.0178	0.0264	0.0257	0.0253	0.0259
Potassium			mg/L	*10.63*	7.9	7.27	10.68	12.21	13.44	12.37	10.52	11.17	10.11
Selenium			mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sodium			mg/L	*7.35*	7.37	6.69	6.5	7.48	8.28	7.72	5.83	7.55	8.77
Strontium			mg/L	*0.354*	0.309	0.176	0.248	0.291	0.305	0.272	0.337	0.366	0.883
Thallium			mg/L	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin			mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium			mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Uranium			mg/L	*0.001*	0.002	< 0.001	< 0.001	0.002	< 0.001	0.001	< 0.001	< 0.001	0.001

Vanadium			mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	0.2	0.1	mg/L	*0.01*	0.004	0.01	0.014	0.003	0.034	0.02	0.009	0.018	0.008
Dissolved Metals													
Antimony			mg/L	*0.0011*	0.0016	0.0029	< 0.0001	0.0015	< 0.0001	0.0024	< 0.0001	0.0013	< 0.0001
Arsenic	0.2	0.1	mg/L	*0.006*	0.0039	0.0042	0.0078	0.0322	0.0015	0.0019	0.001	0.0006	0.0007
Barium			mg/L	*0.083*	0.1099	0.0583	0.0606	0.0837	0.0903	0.069	0.0842	0.0891	0.1063
Beryllium			mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron			mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	0.004	0.002	mg/L	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	0.04	0.02	mg/L	*0.0006*	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	0.2	0.1	mg/L	*0.0024*	0.0033	< 0.0005	0.0036	0.004	0.0024	0.001	0.0007	0.0016	< 0.0005
Iron	2	1	mg/L	*0.01*	< 0.01	< 0.01	< 0.01	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Lead	0.1	0.05	mg/L	*0.0003*	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017
Lithium			mg/L	*0.008*	0.007	< 0.005	0.007	0.007	0.006	< 0.005	0.007	0.007	0.017
Manganese			mg/L	*0.404*	0.292	-	0.419	0.5015	-	-	-	-	-
Mercury	0.008	0.004	mg/L	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum			mg/L	*0.004*	0.0106	< 0.0005	0.0018	0.0082	0.0013	0.0037	0.0014	0.0021	0.0034
Nickel	0.5	0.25	mg/L	*0.018*	0.0056	0.0033	0.0195	0.0246	0.0174	0.0219	0.0268	0.0233	0.0185
Selenium			mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Strontium			mg/L	*0.318*	0.351	0.177	0.248	0.291	0.318	0.238	0.343	0.36	0.648
Thallium			mg/L	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin			mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium			mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Uranium			mg/L	*0.001*	0.002	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vanadium			mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	0.2	0.1	mg/L	*0.012*	0.005	0.011	0.014	0.003	0.031	0.01	0.011	0.015	0.009

Table 8-59 Whale Tail Attenuation Pond Discharge to Mammoth Lake East Diffuser (ST-WT-2a)

ST-WT-2A Parameter	MAX GRAB	MONTHLY MEAN	Unit	*Annual Average*	6/17/2020	6/22/2020	6/29/2020	7/7/2020	7/12/2020	7/20/2020	7/26/2020	8/3/2020	8/10/2020	8/17/2020	8/24/2020	9/1/2020	9/7/2020	9/16/2020	9/21/2020	9/28/2020	10/5/2020
Field Measured																					
Temperature			°C	*7.4*	2.3	3.7	4	10.5	9.36	10.3	11.6	14.2	15.2	10	8.6	7.5	4.9	3	4.7	4	2.1
pH			-	*6.89*	6.68	6.79	6.83	6.60	7.22	7.15	7.1	6.89	7.14	6.99	6.72	6.14	7.04	7.02	6.87	7.02	7.01
Conductivity			uS/cm	*437*	307	376	370	423.6	441	395	352	371	297	360	397	428	426	1082	674	374	359
Turbidity			NTU	*7.55*	1.65	2.09	109	1.73	0.89	0.86	0.57	1.19	0.68	0.71	1.16	1.15	1.77	1.29	0.79	1.55	1.32
Conventional Parameters																					
Hardness			mg CaCO3/L	*205*	155	189	148	169	161	234	161	154	106	178	198	228	179	559	330	144	193
Total alkalinity, as CaCO3			mg CaCO3/L	*47*	30	39	35	45	52	60	42	51	51	48	48	50	43	49	48	49	54
TSS	30	15	mg/L	*6*	4	5	7	6	4	5	4	5	6	5	12	4	6	6	**18**	4	5
Total organic carbon			mg/L	*3.0*	4.3	3.1	2.8	2.3	2.8	3.2	2.5	2.2	1.4	3.8	3.4	3.9	4.6	2.9	2.3	2.6	2.4
Dissolved organic carbon			mg/L	*3.5*	5.2	4.2	2.6	2.2	3.3	4	0.2	1.5	2.8	3.4	4.4	4.8	5.2	5.3	3.9	4	2.6
Major Ions																					
Carbonate			mg CaCO3/L	*5*	< 2	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bicarbonate			mg CaCO3/L	*47*	30	39	35	45	52	60	42	51	51	48	48	50	43	49	48	49	54
Chloride			mg/L	*78*	46.6	52.3	59	61.9	61	65.6	46.4	47.8	38.2	67.3	66	70.9	68.1	306.4	157	62.5	54.2
Reactive Silica			mg/L	*5.9*	4.97	5.47	5.48	6.45	7.01	7.9	6.05	6.59	6.67	3.95	4.85	5.92	5.61	5.47	5.43	6.43	6.68
Sulphate			mg/L	*47.9*	35.1	37.7	48.6	38.8	45.4	66.4	59.8	51.6	41.6	37.9	50.8	60.5	65.3	47.9	38.1	44.7	43.5
Nutrients and Chlorophyll a																					
Total ammonia as NH4			mg N/L	*1.6*	1.15	2.06	2.03	1.78	2.1	4.78	1.4	1.68	1.15	0.48	1.04	1.03	0.7	3.17	1.55	0.62	0.92
Un-Ionized Ammonia, calculated			mg NH3/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate			mg N/L	*3.2*	2.08	4.4	3.89	5.25	4.93	1.44	2.47	3.59	1.86	0.89	2.38	2.64	1.44	9.81	4.47	1.67	1.43
Nitrite			mg N/L	*0.18*	0.15	0.24	0.28	0.14	0.19	0.48	0.16	0.24	0.24	0.05	0.15	0.17	0.09	0.17	0.08	0.04	0.19
Total nitrogen			mg N/L	*2.1*	1.2	2.4	1.8	1.8	6.1	4.9	1.5	1.8	1.5	0.79	1.7	1.5	1.3	3.2	2	1.3	1.4
Total phosphorus	0.6	0.3	mg/L	*0.01*	< 0.01	< 0.01	0.03	< 0.01	< 0.04	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total orthophosphate (as phosphorus)			mg/L	*0.01*	0.01	< 0.01	< 0.01	0.01	0.03	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01
General Organics																					
Total recoverable hydrocarbons	32	16	mg/L	*0.1*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Total Metals																					
Aluminum	1	0.5	mg/L	*0.026*	0.052	0.024	< 0.006	< 0.006	< 0.006	0.018	< 0.006	0.01	0.012	< 0.006	0.026	0.049	0.016	< 0.006	< 0.006	0.008	0.045
Antimony			mg/L	*0.0013*	0.0023	0.0017	< 0.0001	< 0.0001	< 0.0001	0.01	< 0.0001	0.0038	< 0.0001	< 0.0001	< 0.0001	0.0034	0.0005	0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.2	0.1	mg/L	*0.005*	0.0084	0.0167	0.0067	0.0056	0.0046	0.0043	0.0011	0.0013	0.0011	0.0034	0.0034	0.0041	0.0034	0.0026	0.0023	0.0016	0.007
Barium			mg/L	*0.090*	0.0858	0.0992	0.0785	0.091	0.0854	0.1029	0.0849	0.0702	0.025	0.0973	0.0809	0.0991	0.1015	0.1765	0.1246	0.0549	0.0752
Beryllium			mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron			mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	0.004	0.002	mg/L	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Calcium			mg/L	*61.22*	42.2	51.3	42.2	46.5	45.4	59.5	45.4	41.8	29.9	54.7	57	65.9	50.9	195	112	45	56
Chromium	0.04	0.02	mg/L	*0.0007*	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.0007	< 0.0006	0.0006	0.0013	< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.0014
Copper	0.2	0.1	mg/L	*0.003*	0.0008	0.0078	0.0035	0.0042	0.0028	0.0054	0.004	0.0033	0.0022	< 0.0005	0.0033	0.0013	0.0005	0.0025	0.001	< 0.0005	0.0019
Iron	2	1	mg/L	*0.57*	0.62	0.58	0.5	0.69	0.43	0.47	0.48	0.42	0.43	0.85	0.69	0.46	0.56	0.59	0.68	0.56	0.64

Lead	0.1	0.05	mg/L	*0.0002*	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017
Lithium			mg/L	*0.009*	0.007	0.007	0.007	0.006	0.006	0.008	0.006	0.006	< 0.005	0.006	0.007	0.008	0.006	0.032	0.019	0.007	0.007
Magnesium			mg/L	*12.77*	12.21	14.99	10.43	12.89	11.73	20.83	11.53	12.13	7.73	10.29	13.57	15.43	12.59	18.04	12.03	7.64	12.97
Manganese			mg/L	*0.56*	0.509	0.6712	0.6969	0.5966	0.458	0.63	0.4277	0.3339	0.269	0.2875	0.5104	0.6696	0.6592	1.1069	0.744	0.4408	0.4777
Mercury	0.008	0.004	mg/L	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum			mg/L	*0.0033*	< 0.0005	0.004	0.0021	0.0061	0.0059	0.0088	0.0055	0.0043	0.0024	0.0014	0.0011	0.005	0.0015	0.0018	< 0.0005	0.001	0.0035
Nickel	0.5	0.25	mg/L	*0.022*	0.0253	0.035	0.0191	0.0247	0.0208	0.0365	0.0158	0.0208	0.0073	0.0133	0.0187	0.03	0.0232	0.0342	0.0196	0.0086	0.0231
Potassium			mg/L	*12.14*	14	14.9	10.5	15.04	12.1	23.59	11.58	12.72	8.5	8.37	13.44	14.01	9.25	14.58	9.12	5.94	8.78
Selenium			mg/L	*0.0010*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005
Sodium			mg/L	*7.99*	7.85	9.03	9.57	9	6.84	14.9	7.32	7.71	5.14	5.23	8.29	8.64	5.12	10.7	6.92	5.58	8.03
Strontium			mg/L	*0.384*	0.272	0.296	0.27	0.321	0.269	0.374	0.278	0.281	0.179	0.325	0.304	0.31	0.303	1.305	0.733	0.336	0.37
Thallium			mg/L	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin			mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium			mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Uranium			mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	0.001	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001
Vanadium			mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	0.2	0.1	mg/L	*0.010*	0.011	0.017	0.011	0.009	0.002	0.01	0.011	0.009	0.004	0.011	0.015	0.01	0.006	0.014	0.013	0.008	0.003
Dissolved Metals																					
Aluminum			mg/L	*0.006*	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006
Antimony			mg/L	*0.0012*	0.0014	0.0015	< 0.0001	< 0.0001	< 0.0001	0.0118	< 0.0001	0.0023	< 0.0001	< 0.0001	< 0.0001	0.0027	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.2	0.1	mg/L	*0.002*	0.006	0.0118	0.004	0.0035	0.002	0.0027	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0018	0.0017	0.0007	< 0.0005	< 0.0005	< 0.0005	0.0007
Barium			mg/L	*0.081*	0.0661	0.096	0.0694	0.1042	0.0754	0.0997	0.0866	0.0585	0.0266	0.0741	0.0783	0.0808	0.0797	0.157	0.1083	0.0547	0.0536
Beryllium			mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron			mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	0.004	0.002	mg/L	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	0.04	0.02	mg/L	*0.0006*	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	0.2	0.1	mg/L	*0.003*	0.0015	0.0041	0.0032	0.0041	0.003	0.0041	0.0035	0.0019	0.005	< 0.0005	0.0015	0.0005	0.0009	0.0021	< 0.0005	< 0.0005	0.0008
Iron	2	1	mg/L	*0.02*	< 0.01	0.01	< 0.01	0.09	< 0.01	0.02	0.03	< 0.01	< 0.01	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Lead	0.1	0.05	mg/L	*0.0002*	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017
Lithium			mg/L	*0.008*	0.005	0.006	0.007	0.008	0.006	0.007	0.005	< 0.005	< 0.005	0.006	0.006	0.005	0.007	0.028	0.017	0.007	0.005
Manganese			mg/L	*0.6743*	-	-	0.6743	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	0.008	0.004	mg/L	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum			mg/L	*0.0029*	0.0017	0.0035	0.0013	0.0065	0.0049	0.0085	0.0048	0.0035	0.0011	0.0009	0.001	0.0047	0.0015	0.0012	0.0008	0.0007	0.0032
Nickel	0.5	0.25	mg/L	*0.0184*	0.0217	0.0242	0.0183	0.0252	0.0172	0.0255	0.0152	0.013	0.0062	0.0109	0.0144	0.0233	0.0257	0.0298	0.016	0.009	0.0166
Selenium			mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005
Strontium			mg/L	*0.347*	0.212	0.277	0.25	0.32	0.262	0.352	0.269	0.225	0.158	0.25	0.285	0.257	0.326	1.186	0.655	0.354	0.265
Thallium			mg/L	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin			mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium			mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Uranium			mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vanadium			mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	0.2	0.1	mg/L	*0.008*	0.012	0.011	0.012	0.01	0.006	0.009	0.012	0.008	0.006	0.008	0.008	0.005	0.007	0.012	0.008	0.007	0.002

Table 8-60 Whale Tail Attenuation Pond Discharge to Whale Tail South Temporary Diffuser (ST-WT-24a)

ST-WT-24A	MAX GRAB	MAX MONTHLY MEAN	Unit	*Annual Average*	5/29/2020	6/1/2020	6/8/2020	6/14/2020	10/13/2020	10/19/2020	10/26/2020	11/1/2020
Parameter												
Field Measured												
Temperature			°C	*1.8*	2.3	1.2	1.7	2.5	1.8	2.6	1.4	1.1
pH			-	*7.03*	7	6.85	7.24	7.16	6.93	7.06	7.17	6.8
Conductivity			uS/cm	*322*	741.5	319	223	253	297	275	250	213.8
Turbidity			NTU	*1.3*	1.02	1.0	2.57	0.86	1.55	1.77	1.09	0.88
Conventional Parameters												
Hardness			mg CaCO3/L	*123*	256	114	74	87	111	114	103	80
Total alkalinity, as CaCO3			mg CaCO3/L	*43*	52	36	24	25	50	54	62	77
Total suspended solids	30	15	mg/L	*6*	14	2	7	1	2	9	7	6
Total dissolved solids			mg/L	*178*	484	219	164	209	151	11	10	9
Total organic carbon			mg/L	*4.3*	2.9	3.6	6.7	5	3.8	3.5	4.5	3.8
Dissolved organic carbon			mg/L	*4.2*	1.5	1.9	7.4	5.7	5.1	3.3	-	2.9
Major Ions												
Carbonate			mg CaCO3/L	*4*	< 2	< 2	< 2	< 2	< 5	< 5	< 5	< 5
Bicarbonate			mg CaCO3/L	*39*	52	36	24	25	50	54	62	< 5
Chloride			mg/L	*49*	135.7	45.1	29.1	37.6	39.6	39.2	36	30
Reactive Silica			mg/L	*6.56*	8.96	6.12	3.81	4.11	7.15	7.89	7.43	7.03
Sulphate			mg/L	*31*	44.1	26.3	32.4	17.2	38.3	31.8	31	27
Nutrients and Chlorophyll a												
Total ammonia as NH4			mg N/L	*1.01*	2.6	1.68	0.63	0.96	0.6	0.4	0.39	0.79
Un-Ionized Ammonia, calculated			mg NH3/L	*0.01*	0.02	< 0.01	< 0.01	< 0.01	< 0.01	0.0017	0.0015	<0.01
Nitrate			mg N/L	*1.98*	6.25	2.66	1.33	2.4	1.27	0.64	0.41	0.91
Nitrite			mg N/L	*0.07*	0.16	0.13	0.04	0.1	0.04	0.03	0.02	0.04
Total nitrogen			mg N/L	*1.4*	2.8	2	1.3	1.5	1	0.67	0.64	0.93
Total phosphorus	0.6	0.3	mg/L	*0.03*	0.02	0.02	< 0.01	< 0.01	0.05	< 0.04	< 0.04	0.076
Total orthophosphate (as phosphorus)			**mg/L**	*0.01*	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01

General Organics												
Total recoverable hydrocarbons	32	16	mg/L	*0.1*	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1
Total Metals												
Aluminum	1	0.5	mg/L	*0.026*	0.028	0.012	0.026	0.007	0.021	0.049	0.029	0.036
Antimony			mg/L	*0.0006*	< 0.0001	< 0.0001	0.0014	0.0028	0.0001	< 0.0001	< 0.0001	<0.0001
Arsenic	0.2	0.1	mg/L	*0.003*	0.0037	0.0034	0.0036	0.0061	0.0021	0.003	0.0017	0.0018
Barium			mg/L	*0.067*	0.1386	0.0621	0.0505	0.0649	0.0462	0.0528	0.0552	0,0458
Beryllium			mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron			mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	0.004	0.002	mg/L	*0.00002*	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Calcium			mg/L	*35.66*	75	32.6	21.1	24.2	32.5	33.5	30.7	23,6
Chromium	0.04	0.02	mg/L	*0.0013*	0.0009	0.0033	0.0009	< 0.0006	0.0006	0.0021	0.0011	<0.0006
Copper	0.2	0.1	mg/L	*0.0026*	0.0043	0.0032	0.0029	0.0022	0.0027	0.0026	0.0005	0.0021
Iron	2	1	mg/L	*0.5*	0.71	0.6	0.42	0.24	0.43	0.43	0.59	0.46
Lead	0.1	0.05	mg/L	*0.0002*	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017	<0.00030
Lithium			mg/L	*0.005*	0.008	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Magnesium			mg/L	*8.91*	21.44	8.05	5.25	6.54	7.31	7.35	6.45	5,26
Manganese			mg/L	*0.267*	0.3347	0.2389	0.3116	0.3459	0.2303	0.2422	0.2336	0.1967
Mercury	0.008	0.004	mg/L	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum			mg/L	*0.004*	0.013	0.0053	0.0015	0.0015	0.0028	0.0031	0.0032	0.0026
Nickel	0.5	0.25	mg/L	*0.008*	0.0105	0.0089	0.008	0.0145	0.0094	0.0064	0.0042	0.0037
Potassium			mg/L	*7.5643*	11.86	8.29	6.4	7.56	6.41	6.17	6.26	4,97
Selenium			mg/L	*0.0007*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	0.0009	< 0.0005
Sodium			mg/L	*6.6657*	8.67	6.12	7.83	7.1	5.59	6	5.35	4,31
Strontium			mg/L	*0.246*	0.451	0.227	0.156	0.20	0.235	0.258	0.253	0.189
Thallium			mg/L	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin			mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium			mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Uranium			mg/L	*0.001*	0.004	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vanadium			mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	0.2	0.1	mg/L	*0.011*	0.009	0.012	0.011	0.012	0.01	0.028	0.002	0.006

Dissolved Metals												
Aluminum			mg/L	*0.0055*	< 0,006	< 0,006	< 0.006	< 0.006	< 0,005	< 0.005	< 0.005	< 0.005
Antimony			mg/L	*0.0008*	0.0016	< 0.0001	0.0019	0.002	0.0002	< 0.0001	0.0001	0.0002
Arsenic	0.2	0.1	mg/L	*0.002*	0.0022	0.0024	0.0026	0.0046	0.001	0.0017	< 0.0005	0.0006
Barium			mg/L	*0.0660*	0.1735	0.0581	0.0445	0.0537	0.0475	0.0559	0.0557	0.0389
Beryllium			mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.005
Boron			mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0,01
Cadmium	0.004	0.002	mg/L	*0.00002*	< 0.00002	0.00005	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	0.04	0.02	mg/L	*0.0006*	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	0.2	0.1	mg/L	*0.0016*	0.0043	0.0028	0.0009	0.0015	0.0015	0.0011	< 0.0005	0.0007
Iron	2	1	mg/L	*0.02*	0.02	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01
Lead	0.1	0.05	mg/L	*0.0002*	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017	<0.0003
Lithium			mg/L	*0.006*	0.011	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Magnesium			mg/L	*5.5850*	20.33	7.43	4.85	5.27	6.79	< 0.005	< 0.005	5,12
Manganese			mg/L	*0.1062*	-	-	-	-	-	-	0.2094	0.0029
Mercury	0.008	0.004	mg/L	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum			mg/L	*0.0046*	0.0168	0.0045	0.0013	0.0016	0.0027	0.0035	0.0033	0.0029
Nickel	0.5	0.25	mg/L	*0.0073*	0.0116	0.0065	0.0071	0.0122	0.0085	0.0059	0.0035	0.0031
Selenium			mg/L	*0.0008*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Strontium			mg/L	*0.232*	0.436	0.203	0.142	0.163	0.232	0.259	0.228	0.191
Thallium			mg/L	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin			mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium			mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Uranium			mg/L	*0.001*	0.004	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vanadium			mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	0.2	0.1	mg/L	*0.01*	0.01	0.01	0.008	0.01	0.006	0.005	< 0.001	0.003

Table 8-61 Whale Tail Attenuation Pond Discharge to Whale Tail South Permanent Diffuser (ST-WT-24b)

ST-WT-24B	MAX GRAB	MONTHLY MEAN	Unit	*Annual Average*	11/7/2020	11/9/2020	11/16/2020	11/23/2020	12/1/2020	12/7/2020	12/27/2020
Parameter											
Field Measured											
Temperature			°C	*0.8*	0.9	0.9	1	0.7	0.8	0.8	0.5
pH			-	*7.1*	7.11	7.2	7.25	7.33	6.83	7.2	6.71
Conductivity			uS/cm	*239*	250	297	237	235	176.5	223	254
Turbidity			NTU	*1.00*	0.98	0.84	0.66	1.76	0.83	0.95	0.96
Conventional Parameters											
Hardness			mg CaCO3/L	*104*	99	104	120	96	75	108	127
Total alkalinity, as CaCO3			mg CaCO3/L	*52*	55	56	55	56	48	57	38
Carbonate			mg CaCO3/L	*4*	< 5	< 5	< 5	< 5	< 5	< 5	< 2
Bicarbonate			mg CaCO3/L	*51*	< 5	< 5	55	56	48	57	38
TSS	30	15	mg/L	*3*	2	4	3	4	< 1	3	2
Total organic carbon			mg/L	*4*	5.7	3.9	4.2	3.7	3.4	4.9	2.1
Dissolved organic carbon			mg/L	*3.0*	1.2	1.4	4.1	3.6	3.4	4.9	2.7
Major Ions											
Chloride			mg/L	*33*	33	-	33.4	35.7	28	33.7	36.9
Reactive Silica			mg/L	*7.85*	7.31	7.42	7.81	8.14	7.62	8.22	8.4
Sulphate			mg/L	*30.7*	26.1	28.7	27.3	30.8	40.7	22	39.6
Nutrients and Chlorophyll a											
Total ammonia as NH4	32	16	mg N/L	*1.15*	1.9	2.2	1.33	0.8	0.3	1.08	0.41
Un-Ionized Ammonia, calculated			mg NH3/L	*0.01*	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate			mg N/L	*1.3*	2.3	2.85	1.77	0.83	0.25	0.97	0.36
Nitrite			mg N/L	*0.05*	0.08	0.1	0.05	0.02	< 0.01	0.03	0.01
Total nitrogen			mg N/L	*1.5*	2.5	2.8	1.6	1.2	0.61	1.4	0.7
Total phosphorus	0.6	0.3	mg/L	*0.03*	< 0.04	< 0.04	< 0.04	-	-	0.01	0.03
Total orthophosphate (as phosphorus)			mg/L	*0.01*	< 0.01	< 0.01	< 0.01	0.02	0.01	< 0.01	-
General Organics											
Total recoverable hydrocarbons	32	16	mg/L	*0.4*	< 0.1	< 0.1	0.5	< 0.1	< 0.1	0.2	1.78
Total Metals											

Aluminum	1	0.5	mg/L	*0.027*	0.020	0.028	0.026	0.042	0.023	< 0.005	0.023
Antimony			mg/L	*0.0003*	0.0003	0.0003	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.2	0.1	mg/L	*0.0020*	0.0025	0.0025	0.001	0.0019	0.0014	0.0026	0.002
Barium			mg/L	*0.0563*	0.0529	0.0535	0.0572	0.0666	0.0377	0.0631	0.0634
Beryllium			mg/L	*0.0006*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron			mg/L	*0.03*	< 0.01	< 0.01	0.12	< 0.01	< 0.01	< 0.01	< 0.002
Cadmium	0.004	0.002	mg/L	*0.00003*	0.00006	0.00006	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Calcium			mg/L	*29.31*	28.4	29.6	35.7	28.5	22.3	31.7	37.4
Chromium	0.04	0.02	mg/L	*0.0006*	0.0008	< 0.0006	0.0007	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	0.2	0.1	mg/L	*0.002*	0.004	0.0043	< 0.0005	0.0012	< 0.0005	0.0046	0.0006
Iron	2	1	mg/L	*0.39*	0.59	0.52	0.42	0.5	0.51	0.07	0.14
Lead	0.1	0.05	mg/L	*0.00017*	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017
Lithium			mg/L	*0.006*	< 0.005	< 0.005	0.013	< 0.005	< 0.005	< 0.005	< 0.005
Magnesium			mg/L	*6.98*	6.88	7.27	7.59	7.58	4.8	7.14	8.22
Manganese			mg/L	*0.249*	0.2176	0.2014	0.2446	0.1978	0.2965	0.3036	0.2783
Mercury	0.008	0.004	mg/L	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum			mg/L	*0.005*	0.0049	0.0057	0.005	0.0057	< 0.0005	0.0042	0.0051
Nickel	0.5	0.25	mg/L	*0.0045*	0.0057	0.0063	0.0044	0.0036	0.0032	0.0034	0.005
Potassium			mg/L	*5.793*	6.43	6.42	6.69	5.78	3.5	4.94	5.7
Selenium			mg/L	*0.0006*	0.0013	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Sodium			mg/L	*5.8*	5.79	5.63	6.22	6.75	4.21	6.07	6.73
Strontium			mg/L	*0.218*	0.239	0.215	0.271	0.197	0.178	0.205	0.221
Thallium			mg/L	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin			mg/L	*0.002*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium			mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Uranium			mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001
Vanadium			mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	0.2	0.1	mg/L	*0.006*	0.006	0.005	0.003	< 0.001	0.01	< 0.001	0.002
Dissolved Metals											
Aluminum			mg/L	*0.005*	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Antimony			mg/L	*0.0004*	0.0005	0.0007	< 0.0001	< 0.0001	< 0.0001	0.0001	0.0004

Arsenic	0.2	0.1	mg/L	*0.0009*	0.0011	0.0013	< 0.0005	< 0.0005	0.0008	0.0015	0.0014
Barium			mg/L	*0.056*	0.058	0.061	0.0575	0.0574	0.0385	0.0618	0.06
Beryllium			mg/L	*0.0004*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron			mg/L	*0.02*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.002
Cadmium	0.004	0.002	mg/L	*0.00002*	< 0.00002	0.00006	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	0.04	0.02	mg/L	*0.0007*	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	0.2	0.1	mg/L	*0.0021*	0.0029	0.0034	< 0.0005	< 0.0005	< 0.0005	0.0031	0.0007
Iron	2	1	mg/L	*0.03*	< 0.01	< 0.01	< 0.01	-	-	< 0.01	< 0.01
Lead	0.1	0.05	mg/L	*0.00017*	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017
Lithium			mg/L	*0.005*	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Manganese			mg/L	*0.25*	-	-	-	-	0.2893	-	6.36
Mercury	0.008	0.004	mg/L	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00002
Molybdenum			mg/L	*0.0046*	0.0047	0.0067	0.0049	0.0041	< 0.0005	0.0043	0.005
Nickel	0.5	0.25	mg/L	*0.0037*	0.0051	0.0051	< 0.0005	0.0036	0.0029	0.0028	0.0053
Selenium			mg/L	*0.0005*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Strontium			mg/L	*0.219*	0.216	0.213	0.233	0.208	0.187	0.227	0.212
Thallium			mg/L	*0.0002*	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin			mg/L	*0.002*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium			mg/L	*0.009*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Uranium			mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001
Vanadium			mg/L	*0.001*	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	0.2	0.1	mg/L	*0.006*	0.005	0.006	0.004	< 0.001	0.014	0.005	0.005

8.5.3.2.14 Groundwater Storage Pond Effluent – GSP-1

The management of underground water was transferred from the Water License 2BB-MEA1828 to the 2AM-WTP1830 Licence in 2020. Groundwater Storage Pond One (GSP-1) formally A-P5 (MEA-4) is used to store water from the underground operations. Water from GSP-1 is pumped to the Whale Tail Attenuation Pond as require and treated in the WTP prior to discharge. A total volume of 2,297 m^3 was pumped from underground to GSP-1 in 2020 during the month from June to July. As per the Water Licence, sampling is conducted four times per year minimum. Agnico Eagle is currently sampling GSP-1 on a weekly basis during open water conditions to obtain a water quality baseline. Results are provided in Table 8-62 below.

Table 8-62 Whale Tail Groundwater Storage Pond (GSP-1) Discharge 2020 Water Quality Monitoring

ST-WT-20	Unit	Annual Average	6/10/2020	6/14/2020	6/21/2020	6/28/2020	7/5/2020	7/12/2020	7/19/2020	7/26/2020	8/3/2020	8/9/2020	8/16/2020	8/23/2020	8/30/2020	9/6/2020	9/13/2020	9/20/2020	9/27/2020	10/4/2020
Parameter																				
Field Measured																				
pH	-	*7.43*	7.54	7.35	7.14	7.00	6.75	7.55	7.12	7.61	7.62	7.62	7.38	7.55	7.53	7.6	7.74	7.52	7.51	7.54
Conductivity	uS/cm	*2070*	695	521	665	1995	854	1017	2879	1263	1400	1502	1805	2112	2139	3170	3320	5030	560	6340
Dissolved oxygen	mg/L	*10.22*	11.69	11.37	9.92	9.92	9.44	8.94	7.96	9.57	8.56	8.55	9.66	10.05	9.91	11.33	11.75	11.42	11.52	12.36
Turbidity	NTU	*17*	14	131	54.2	43.2	9.41	6.76	8.25	5.08	8.08	3.05	2.66	3.57	3.34	6.22	5.4	2.65	2.92	3.76
Conventional Parameters																				
Hardness	mg CaCO3/L	*1209*	287	192	332	1031	433	468	1435	590	645	634	828	1062	1309	1813	1833	2743	2443	3684
Total alkalinity, as CaCO3	mg CaCO3/L	*47*	28	30	34	40	35	38	45	52	52	53	37	54	55	56	56	60	58	60
TSS	mg/L	*18*	9	85	47	35	12	4	8	9	12	6	7	11	11	12	7	18	17	13
TDS	mg/L	*1446*	633	379	396	1241	493	610	1780	757	915	943	1169	1305	1431	1950	2029	3012	3153	3828
Major Ions																				
Chloride	mg/L	*672*	181.2	126.4	153.3	524	203.7	220.6	850.4	335.9	382.3	372.6	488.1	583.3	641.3	891	970	1539.6	1643.9	1990.1
Fluoride	mg/L	*0.07*	0.04	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.07	0.09	0.14	0.07	0.07	0.07	0.08	0.08	0.08	0.09
Sulphate	mg/L	*24.0*	6.3	16.7	14.4	18.3	12.8	16.6	22	19.6	20.5	20.5	20.2	23.4	28	33.2	33.8	40.7	41.3	44.2
Nutrients and Chlorophyll a																				
Total ammonia as NH4	mg/L	*7.02*	1.25	1.1	1.4	4.93	1.77	2.4	8.99	3.2	3.85	4.37	5.14	6.1	6.77	9.96	11.35	16.08	17.79	19.92
Nitrate	mg/L	*17.75*	3.38	1.95	3.5	10.9	4.51	6.21	4.6	8.9	10.9	10.3	17.1	15.9	21.6	25.4	28.8	47.2	50.1	48.2
Nitrite	mg/L	*0.23*	0.05	0.09	0.08	0.13	0.3	0.1	0.2	0.04	0.15	0.2	0.18	0.32	0.25	0.4	0.37	0.37	0.48	0.51
Total Metals																				
Aluminum	mg/L	*0.243*	0.273	1.223	0.975	0.652	0.268	0.067	0.125	0.099	0.186	0.084	0.074	0.031	0.033	0.099	0.098	0.04	0.007	0.038
Arsenic	mg/L	*0.0084*	0.0109	0.0202	0.0155	0.0141	0.0129	0.0085	0.0104	0.0074	0.0072	0.0059	0.005	0.0055	0.0062	0.006	0.0057	0.0038	0.0021	0.0036
Barium	mg/L	*0.353*	0.0897	0.0963	0.120	0.3186	0.1455	0.1615	0.4119	0.1995	0.2039	0.201	0.2603	0.3008	0.3685	0.5662	0.5378	0.7604	0.6933	0.9107
Cadmium	mg/L	*0.0003*	< 0.00002	0.00013	< 0.00002	0.0001	< 0.00002	< 0.00002	0.00069	< 0.00002	0.00023	< 0.00002	0.00014	0.0004	0.00059	0.001	0.00059	0.00087	< 0.00002	0.001
Chromium	mg/L	*0.0034*	0.0062	0.0123	0.0108	0.0086	0.004	0.0015	0.0024	0.0019	0.0028	0.0013	0.0018	0.001	0.0011	0.0021	0.0018	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	*0.0027*	0.0025	0.0054	0.0032	0.0052	0.0018	< 0.0005	0.0043	0.0021	0.002	0.0015	< 0.0005	0.0042	0.0022	0.0033	0.0036	0.0032	0.001	0.0026
Iron	mg/L	*0.49*	0.54	2.70	1.50	0.97	0.49	0.28	0.32	0.25	0.29	0.18	0.17	0.14	0.15	0.31	0.28	0.14	0.08	0.07
Lead	mg/L	*0.0004*	< 0.0003	0.0021	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.00017	< 0.00017	< 0.00017	0.0016	< 0.00017	< 0.00017	< 0.00017	< 0.00017	< 0.00017
Manganese	mg/L	*1.9087*	0.2523	0.4164	0.5376	1.4405	0.6388	0.7983	2.2152	1.0034	1.0858	1.0765	1.4071	1.6994	2.2349	3.3435	3.3101	3.8777	3.6553	5.3641
Mercury	mg/L	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0035*	0.0014	0.0026	0.0024	0.0032	0.0035	0.0024	0.0043	0.0034	0.0037	0.0026	0.0039	0.0026	0.0045	0.0049	0.004	0.0046	0.0038	0.005
Nickel	mg/L	*0.0537*	0.0136	0.0189	0.0207	0.0463	0.0212	0.0267	0.0824	0.0326	0.0346	0.032	0.0408	0.0482	0.06	0.0834	0.0866	0.0923	0.0917	0.1342
Selenium	mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005
Silver	mg/L	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	*0.0002*	0.0003	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	*0.009*	0.001	0.007	0.007	0.008	0.004	< 0.001	0.011	0.005	0.007	0.006	0.005	0.012	0.005	0.019	0.021	0.015	0.011	0.024

8.5.3.2.15 Erosion Management

As required by NIRB Project Certificate 008 Condition 11: ***The Proponent shall develop and implement an Erosion Management Plan to prevent or minimize erosion and its resulting effects from project-related land disturbance.***

In accordance with Condition 11 of NIRB Project Certificate No. 008, Agnico Eagle maintains an Erosion Management Plan (V2; December 2018) for the Whale Tail site. This plan presents the monitoring and mitigation actions related to three specific events which have the potential to cause erosional concerns: dike construction and dewatering, freshet, and the rise of water levels in Whale Tail South.

For each of these three events monitoring consists of water quality analyses and/or visual inspections in erosion-prone areas.

8.5.3.2.15.1 Water Quality

According to the Erosion Management Plan, water quality monitoring for erosion management generally consists of TSS or turbidity assessments, which are conducted and reported under a number of programs, as follows.

- For erosion related to dike construction and dewatering:
  - Water Quality Monitoring and Management Plan for Dike Construction and Dewatering, as described in Appendix 59 of this report.
- For erosion related to freshet:
  - Water Quality and Flow Monitoring Plan (according to NWB Type A Water License requirements), as described in Section 8.5 of this report.
  - Freshet Action Plan (below)
- For erosion related to increased water levels due to flooding:
  - Water Quality and Flow Monitoring Plan (according to NWB Type A Water License requirements), as described in Section 8.5 of this report
  - CREMP (Appendix 33 of this report).

Results of these programs are reported under the various sections of this Annual Report, as described above.

Results of water quality monitoring under the Freshet Action Plan and in relation to Whale Tail South flooding are reported here.

8.5.3.2.15.2 Freshet Action Plan Monitoring

Under this Plan, inspections of water management infrastructure (bridges, culverts, ditches) are conducted daily by dedicated personnel starting in May, and water quality monitoring for turbidity/TSS is conducted as required based on visual observations (see next section). TSS is analyzed by onsite assay laboratory procedures when excess turbidity is observed, and by commercial accredited laboratory if any elevated results are received. Measured TSS results that exceed 30 mg/L are reported to appropriate regulators.

Visual inspections for freshet monitoring under the Freshet Action Plan occur daily or weekly during freshet for onsite and Whale Tail Haul road water management infrastructure including culverts, ditches, bridges, and the Whale Tail South channel. An inspection log is maintained, documenting general conditions at each location, observations on flow rates and clarity, turbidity sample collection (as required), and any mitigation measures that are implemented.

In 2020, no major erosion concerns that required mitigation actions were identified during visual inspections for Whale Tail Haul Road water management infrastructure, and no water quality samples were required to be collected.. As precautionary measures, straw booms or woodchip booms were installed for Whale Tail Haul Road infrastructure as follows:

- Culvert km 133
  - Boom installed on east side on June 25
- Culvert km 166
  - Boom installed on June 28
- Culvert km 175
  - Boom installed on June 25
- Culvert km 178
  - Boom installed on July 13
- Bridge km 135
  - Boom installed June 24
- Bridge km 159
  - Boom installed June 25
- Bridge km 160
  - Boom installed June 27

For onsite inspections, no major concern were observed. During snowmelt, some water was observed ponding along the road leading to the emulsion plant and South Whale Tail Channel. This ponding water against the road may cause geotechnical concern and may cause potential erosional concerns. Booms were preventively installed downstream of the road beginning June 9th. In mid-July, water levels declined and the observed overland flow ceased. Culverts were installed on August to mitigate these concerns in coming freshet seasons and will be inspected as per the freshet action plan.

8.5.3.2.15.3 Whale Tail South Flooding

In addition to freshet monitoring, visual inspections were conducted on a regular basis during the open water season throughout the Whale Tail South flood zone. These surveys were conducted opportunistically by Environment Department technicians to ensure that erosion along the new banks did not mobilize excess TSS into Whale Tail Lake. Shorelines were observed for any major instability, along with signs of permafrost degradation such as ground ice melting, gully and fissuring. None of these issues were identified in 2020 and no mitigation was required.

8.5.4 Sewage Treatment Plant

8.5.4.1 *Meadowbank Site*

The Meadowbank mine site has one Seprotech L333 (STP-SEP) sewage treatment plant (STP) and three Little John 100 units (LJ-MIX) in operation; the equipment operates together with one sewage discharge effluent stream directed to the Stormwater Management Pond (SMP). In 2020, water was pumped from the SMP to the South Cell TSF in July, August, 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 8-64, for influent (STP-IN), Seprotech L333 and LJ-MIX effluent. Results of the sample analysis are submitted to the NWB in the monthly monitoring reports.

The total volume of treated sewage discharged in 2020 was 23,800 m^3. In addition, 316 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 8-63.

Table 8-63 Meadowbank 2020 Sewage Treatment Plant Waste Volume

Sewage volume from STP 2020			
Month	**Total flow to biodisks (m^3)**	**Total Lift station #3 out (m^3)**	**Lift #2 and Biodisks sludge out (m^3)**
	Sewage Collected at EQ tank	*All water (grey and black) discharged to TDL*	*Sewage sludge removed from STP*
January	2,643	3,654	20.40
February	2,225	3,161	40.80
March	2,163	2,966	47.60
April	1,389	1,885	0.00
May	1,600	2,150	13.94
June	1,887	2,522	0.00
July	1,921	2,616	49.30
August	2,092	2,826	40.80
September	1,895	2,599	34.00
October	1,973	2,817	17.00
November	2,003	2,762	34.00
December	2,009	2,873	18.36
Total	**23,800**	**32,831**	**316**

Note:
Daily the sewage truck picks up greywater from TCG and then grease from kitchen and takes that to the Tailings Pond
After that the sewage truck picks up sewage from various locations around the mine and takes that to the STP

Table 8-64 Meadowbank 2020 Sewage Treatment Plan (STP-IN, STP-SEP and LJ-MIX)

STP-IN	Sample date	2020-01-06	2020-02-03	2020-03-02	2020-04-06	2020-05-04	2020-06-01	2020-07-06	2020-08-03	2020-09-07	2020-10-05	2020-11-04	2020-12-14
Parameter	**Unit**												
Field Measured													
pH	pH units	7.5	8.2	7.4	7.4	7.0	7.4	7.7	7.7	7.8	7.0	7.8	8.3
Conventional Parameters													
TSS	mg/L	348	189	158	294	162	125	84	79	71	236	77	807
Nutrients and Chlorophyll a													
Biochemical oxygen demand	mg/L	235	233	239	141	115	160	131	155	245	192	195	180
Chemical oxygen demand	mg/L	569	535	613	132	413	420	-	467	640	545	652	599
Total ammonia as NH4	mg N/L	83	89,1	86,45	90,92	80,10	87,50	66,87	70,99	105,28	100,58	94	81,67
Un-Ionized Ammonia, calculated	mg NH3/L	0,9	1,82	1,77	0,62	1,14	0,85	0,54	0,75	1,04	1,37	1,5	1,06
Nitrate	mg N/L	0,4	0,06	0,14	0,12	< 0,01	0,06	0,26	0,27	2,29	0,14	0,43	0,25
Nitrite	mg N/L	0,08	0,31	0,27	0,16	0,30	0,04	0,01	0,02	0,02	0,03	0,02	0,06
TKN	mg N/L	95	100	110	90	87	99	79	94	130	120	97	96
Total phosphorus	mg/L	9,82	8,08	10,36	8,68	7,21	7,86	8,19	9,56	12,42	10,71	9,4	0,01
Coliforms													
Total Coliform	CFU/100mL	48000000	> 80000000	42000000	150000	9000000	9000000	6000000	16000000	12000000	9000000	38000000	13000000
Fecal Coliform	CFU/100mL	4800000	3100000	2900000	20000	2000000	3600000	5000000	600000	4000000	2400000	2800000	2400000
Atypical colonies	CFU/100mL	53000000	-	-	210000	29000000	31000000	14000000	37000000	111000000	60000000	52000000	22000000

STP-SEP	Sample date	2020-01-06	2020-02-03	2020-03-02	2020-04-06	2020-05-04	2020-06-01	2020-07-06	2020-08-03	2020-09-07	2020-10-05	2020-11-04	2020-12-14
Parameter	**Unit**												
Field Measured													
pH	pH units	7.30	7.6	7.5	6.1	5.9	6.4	7.1	7.3	7.0	6.9	6.9	7.2
Conventional Parameters													
pH	pH units	7,7	7,8	7,82	6,40	5,77	6,78	7,24	7,52	7,63	7,61	7,58	7,54
TSS	mg/L	16	11	10	8	10	5	47	12	22	20	13	12
Nutrients and Chlorophyll a													
Biochemical oxygen demand	mg/L	7	8	9	3	4	4	7	7	11	17	6	8
Chemical oxygen demand	mg/L	64	71	58	56	56	49	-	51	72	80	56	45
Total ammonia as NH4	mg N/L	38,23	60,28	43,13	0,96	12,23	9,62	16,11	28,20	35,58	35,62	33	36,86
Un-Ionized Ammonia, calculated	mg NH3/L	0,52	1,03	0,77	< 0,01	< 0,01	0,02	0,08	0,25	0,41	0,40	0,34	0,35
Nitrate	mg N/L	5,01	2,49	2,76	13,0	29,0	22,7	5,65	2,45	3,98	2,75	4,40	3,67
Nitrite	mg N/L	1,15	1,29	1,39	0,57	0,18	0,50	0,38	1,90	1,12	1,62	1,03	1,05
TKN	mg N/L	43	62	47	3,7	15	13	20	32	41	38	34	37
Coliforms													
Total Coliform	CFU/100mL	300	< 10000	5000	3000	300	2000	<10000	1600000	10000	< 10000	7000	800
Fecal Coliform	CFU/100mL	200	<1000	120	< 1000	10	1000	< 1000	< 1000	40	1000	25	< 1000
Atypical colonies	CFU/100mL	93000	680000	-	46000	2500	61000	130000	9900000	27000	240000	11600	12900

STP-LJ-MIX	Sample date	2020-01-06	2020-02-03	2020-03-02	2020-04-06	2020-05-04	2020-06-01	2020-07-06	2020-08-03	2020-09-07	2020-10-05	2020-11-04	2020-12-14
Parameter	**Unit**												
Field Measured													
pH	pH units	6.4	7.1	6.8	5.3	5.7	5.9	5.3	5.5	5.7	5.8	5.1	6.5
Conventional Parameters													
pH	pH units	5,84	6,83	7,18	5,68	5,67	6,01	6,31	5,18	6,43	6,39	4,58	7,11
TSS	mg/L	57	19	10	8	8	5	6	9	18	9	10	11
Nutrients and Chlorophyll a													
Biochemical oxygen demand	mg/L	8	14	10	2	4	3	2	3	3	3	6	3
Chemical oxygen demand	mg/L	83	73	61	37	48	42	-	32	52	88	34	36
Total ammonia as NH4	mg N/L	2,72	15,46	7,28	9,71	23,14	9,89	5,83	2,62	11,79	30,45	12	18,38
Un-Ionized Ammonia, calculated	mg NH3/L	< 0,01	0,03	0,03	< 0,01	< 0,01	< 0,01	< 0,01	< 0,01	< 0,01	0,02	< 0,01	0,06
Nitrate	mg N/L	20,6	33,5	11,5	26,7	38,2	28,6	20,0	21,5	25,3	42,7	25,7	14,7
Nitrite	mg N/L	0,37	0,68	1,79	0,16	0,26	0,21	< 0,01	0,05	0,10	0,04	0,10	0,36
TKN	mg N/L	7,2	20	12	11	25	12	4,8	3,8	11	34	13	18
Coliforms													
Total Coliform	CFU/100mL	180000	420000	150000	< 10000	31000	< 10000	< 10000	5000	2000	10000	< 10000	6000
Fecal Coliform	CFU/100mL	5400	7000	>6000	800	< 1000	10	< 1000	18	20	1820	< 1000	580
Atypical colonies	CFU/100mL	170000	< 680000	-	300000	313000	1000	430000	10000	3000	60000	12000	4000

8.5.4.2 *Whale Tail Site*

In 2020, effluent from the Sewage Treatment Plan (STP) was discharged to the Whale Tail Attenuation Pond on a daily basis. As per Water License Schedule I Sampling location ST-WT-11 (Figure 4), effluent is to be sampled four times per calendar year. To asses the efficiency of the STP, a weekly sample were taken at the STP effluent. There are no applicable license limits. Results are provided in Table 8-66 below.

The total volume of treated sewage discharged in 2020 from the Newterra associated to the permanent camp was 25,128 m^3. In addition, 923 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 8-65.

Table 8-65 Whale Tail Permanent Camp 2020 Newterra Sewage Treatment Plant Waste Volume

Month	Total flow out Newterra Permanent Camp (m^3)	Sludge Removal (m^3)
January	2,065.40	59.00
February	2,093.70	70.50
March	2,699.20	67.50
April	1,436.28	24.00
May	1,775.24	58.00
June	1,934.50	66.50
July	2,172.60	47.50
August	2,340.40	153.00
September	2,524.20	94.50
October	2,752.78	56.30
November	2,687.70	144.00
December	2,818.65	130.00
Total	**25,128**	**923.30**

Table 8-66 Whale Tail 2020 Sewage Treatment Plan (ST-WT-11)

ST-WT-11	Unit	Annual Average	1/1/2020	1/6/2020	1/13/2020	1/20/2020	1/27/2020	2/3/2020	2/10/2020	2/17/2020	2/24/2020	3/2/2020	3/9/2020	3/17/2020	3/23/2020	3/30/2020
Parameter																
Field Measured																
pH	-	7.00	7.4	6.6	6.96	6.9	6.9	6.26	6.78	6.5	6.81	6.4	6.7	6.7	6.88	7.4
Conventional Parameters																
Turbidity	NTU	1.21	0.77	0.63	0.43	0.47	2.88	2.06	1.07	1.5	0.32	0.64	1.51	0.94	1.23	0.44
Specific conductivity	umhos/cm	581	-	673	604	960	< 1	508	563	599	533	532	621	652	642	794
Hardness	mg CaCO3/L	71	68	63	80	82	85	83	70	76	78	92	85	84	60	53
Total alkalinity, as CaCO3	mg CaCO3/L	112	138	11	118	349	306	87	105	102	93	95	110	90	131	181
TSS	mg/L	3	1	2	2	2	1	5	1	< 1	3	2	2	3	< 1	1
Major Ions																
Chloride	mg/L	81	86.7	90	93	90.3	84.5	86.7	86.8	87.4	88.8	89.7	90.2	96.4	80.7	79.5
Fluoride	mg/L	0.06	0.07	0.07	0.07	0.06	0.06	0.06	0.07	0.08	0.07	0.07	0.06	0.06	0.07	0.07
Sulphate	mg/L	38.5	53.9	52.2	47.7	60.7	47.1	43.8	39.3	43.7	41.9	38	38.4	49.5	38.1	35.6
Nutrients and Chlorophyll a																
Ammoniacal Nitrogen as NH4	mg/L	0.26	0.19	0.13	0.08	0.16	0.14	0.18	0.14	0.19	0.34	0.08	0.57	0.21	0.36	0.2
Total ammonia as NH4	mg/L	0.27	0.19	0.14	0.08	0.16	0.16	0.18	0.14	0.2	0.35	0.08	0.57	0.21	0.37	0.21
Un-Ionized Ammonia, calculated	mg/L	0.01	-	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg/L	16.51	-	9.98	10.9	10.3	11.4	14.8	16.3	17.1	15.2	15.8	14.3	20	16	15.2
Nitrite	mg/L	0.14	-	0.24	0.07	0.09	0.18	0.25	0.2	0.18	0.03	< 0.01	0.07	0.14	0.21	0.18
Total phosphorus	mg/L	5.96	5.34	5.26	4.4	6.01	5.36	6.18	7.65	9.4	7.01	5.23	4.46	6.57	6.62	5.33
Total orthophosphate (as phosphorus)	mg/L	6.11	5.37	5.42	4.61	6.28	5.47	6.32	8.17	9.73	6.07	5.24	4.32	6.78	6.68	5.58
Total Metals																
Aluminum	mg/L	0.039	0.057	0.062	0.041	0.029	0.027	0.017	0.01	0.025	0.015	0.017	0.02	0.015	0.03	0.085
Arsenic	mg/L	0.0059	0.0052	0.004	0.0078	0.0047	0.0066	0.0053	0.0035	0.0051	0.0045	0.0042	0.0053	0.0051	0.0056	0.0048
Barium	mg/L	0.0037	0.0023	0.0022	0.0024	0.0026	0.003	0.0031	0.0029	0.0034	0.0028	0.0045	0.0029	0.0038	0.0029	0.002
Cadmium	mg/L	0.00003	< 0.00002	< 0.0000200	< 0.0000200	< 0.0000200	< 0.0000200	< 0.0000200	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002	< 0.0000200	< 0.00002	< 0.00002
Chromium	mg/L	0.0011	0.0008	0.0007	0.0014	< 0.0006	0.0022	0.001	0.0016	0.0013	0.002	0.001	0.0007	0.0011	0.0018	< 0.0006
Copper	mg/L	0.0154	0.0065	0.0069	0.0164	0.0107	0.0155	0.0135	0.0113	0.0138	0.0064	0.0196	0.0116	0.0152	0.0062	0.0079
Iron	mg/L	0.05	0.03	0.05	0.07	< 0.01	< 0.01	< 0.01	< 0.01	0.05	0.03	0.03	0.04	0.12	0.03	0.02
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	0.003	0.0016	< 0.0005	0.001	0.0025	0.0019	0.003	0.0041	0.0038	0.0025	0.0013	0.0035	0.0054	0.0018	0.0011
Mercury	mg/L	0.00001	< 0.00001	< 0.0000100	< 0.0000100	< 0.0000100	< 0.0000100	< 0.0000100	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.0000100	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0012	0.0009	0.0008	0.0008	0.0008	0.0013	0.0008	0.0008	0.0024	< 0.0005	0.0006	0.0011	0.0008	0.0011	0.0019
Nickel	mg/L	0.0069	0.0081	0.0051	0.0066	0.0069	0.0073	0.0068	0.0066	0.0101	0.007	0.0061	0.0061	0.0073	0.0052	0.0037
Selenium	mg/L	0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001	0.001	< 0.001	< 0.001
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0004	< 0.0001	< 0.0001	< 0.0001
Titanium	mg/L	0.01	0.02	0.02	0.02	0.01	0.01	0.02	0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Zinc	mg/L	0.057	0.052	0.035	0.047	0.056	0.047	0.052	0.042	0.065	0.038	0.046	0.061	0.098	0.057	0.056

ST-WT-11	Unit	*Annual Average*	4/6/2020	4/13/2020	4/20/2020	5/4/2020	5/11/2020	5/18/2020	5/25/2020	6/1/2020	7/7/2020	8/3/2020	9/7/2020	10/5/2020	11/2/2020	12/7/2020
Parameter																
Field Measured																
pH	-	*7.00*	7.1	6.9	7	6.6	6.89	7.5	7.26	7.29	-	7.2	7.34	7.18	7.61	7.44
Conventional Parameters																
Turbidity	NTU	*1.21*	2.15	1.72	3.29	3.55	1.34	1.31	2.34	0.71	0.83	0.27	0.38	0.37	0.27	0.43
Specific conductivity	umhos/cm	*581*	651	607	591	839	894	615	673	698	540	503	508	457	24	462
Hardness	mg CaCO3/L	*71*	61	73	81	82	58	62	52	59	70	80	67	68	50	61
Total alkalinity, as CaCO3	mg CaCO3/L	*112*	140	82	80	44	108	84	102	112	85	63	98	61	112	92
TSS	mg/L	*3*	5	< 1	9	5	3	2	6	< 1	< 1	1	3	< 1	6	11
Major Ions																
Chloride	mg/L	*81*	72.1	83.6	83.5	74	73.3	78.7	75.9	72.7	75.3	85.2	65.7	65.7	64	70.4
Fluoride	mg/L	*0.06*	0.06	0.06	0.06	0.06	0.09	0.05	0.06	0.06	0.05	0.06	0.06	0.06	0.06	0.06
Sulphate	mg/L	*38.5*	48.9	29.9	30.5	35.5	30.1	39.8	36.4	35.8	28.6	29.3	36.8	23.1	19	23.1
Nutrients and Chlorophyll a																
Ammoniacal Nitrogen as NH4	mg/L	*0.26*	0.65	0.68	1.03	0.16	0.64	0.1	0.25	0.07	0.21	0.11	0.09	0.08	0.04	0.28
Total ammonia as NH4	mg/L	*0.27*	0.66	0.69	1.03	0.16	0.64	0.1	0.26	0.07	0.21	0.11	0.09	0.08	0.04	0.28
Un-Ionized Ammonia, calculated	mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	mg/L	*16.51*	10.6	12.8	9.38	47	45.6	15.5	9.93	15.8	54.7	5.37	9.65	14	1.9	6.28
Nitrite	mg/L	*0.14*	0.18	0.7	0.16	0.2	0.07	0.12	0.17	0.05	0.02	0.02	0.02	0.02	0.08	0.06
Total phosphorus	mg/L	*5.96*	7.2	7.81	7.59	8.69	7.82	5.01	4.52	3.55	5.3	3.8	4.68	4.73	4.6	6.86
Total orthophosphate (as phosphorus)	mg/L	*6.11*	7.13	7.55	8.55	8.25	9.11	5.35	4.9	4.27	5.25	3.96	5.43	4.32	4.65	6.29
Total Metals																
Aluminum	mg/L	*0.039*	0.065	0.034	0.079	0.084	0.086	0.069	0.065	0.066	0.029	0.019	0.019	0.026	0.008	< 0.005
Arsenic	mg/L	*0.0059*	0.0057	0.0053	0.0056	0.0075	0.0057	0.0046	0.014	0.0075	0.0077	0.0055	0.0078	0.007	0.004	0.0049
Barium	mg/L	*0.0037*	0.0023	0.0037	0.0031	0.0048	0.0043	0.0027	0.0028	0.0023	0.0025	0.005	0.0051	0.0069	0.009	0.0093
Cadmium	mg/L	*0.00003*	< 0.00002	0.00004	0.00006	0.00004	0.00007	0.00005	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	*0.0011*	0.0019	< 0.0006	0.0011	0.0021	0.0027	0.0006	0.0006	0.0009	0.001	0.0011	0.0008	0.0006	0.0006	0.0007
Copper	mg/L	*0.0154*	0.0199	0.0068	0.0169	0.0306	0.0195	0.0195	0.0124	0.0238	0.0257	0.0312	0.0199	0.0274	0.0105	0.0044
Iron	mg/L	*0.05*	0.06	0.04	0.09	0.09	0.1	0.05	0.05	0.05	0.05	0.03	0.06	0.06	0.03	0.04
Lead	mg/L	*0.0003*	0.0004	< 0.0003	0.0004	< 0.0003	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0017	< 0.00017	< 0.00017	0.0003	< 0.00017
Manganese	mg/L	*0.003*	0.0028	0.0046	0.0039	0.0028	0.0019	0.0019	0.0041	< 0.0005	0.0022	0.0115	0.0025	0.0014	0.001	< 0.0005
Mercury	mg/L	*0.00001*	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	*0.0012*	0.002	0.0024	0.0021	0.002	0.0018	0.0021	0.0023	< 0.0005	< 0.0005	0.0007	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	*0.0069*	0.0052	0.0069	0.008	0.0111	0.0068	0.0078	0.0066	0.0067	0.0088	0.0074	0.0079	0.0069	0.0047	0.0056
Selenium	mg/L	*0.001*	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.0005
Silver	mg/L	*0.0001*	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Titanium	mg/L	*0.01*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Zinc	mg/L	*0.057*	0.057	0.058	0.054	0.056	0.04	0.045	0.039	0.051	0.059	0.126	0.073	0.085	0.054	0.053

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 15th, 2020. Water from the Meadowbank tank farm will be directed South of the tank farm to get the Meadowbank Stormwater Management Pond and will not reach any receiving environment. Results are presented in Table 8-67 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 9 of the 2AM-MEA1530 Water License. Notification to the CIRNAC Inspector, made in accordance with Part F, Item 13 of NWB License 2AM-MEA1530 to empty the secondary containment area, was sent June 15th and September 4th, 2020. As a result, 200 m^3 of water was discharged in June to the Stormwater Management Pond via a temporary pipe from the secondary containment area of the Meadowbank bulk fuel storage tank and no water was discharged in September.

Table 8-67 Meadowbank 2020 Bulk Fuel Storage Facility Water Quality Monitoring (ST-37)

Parameter	MAX GRAB	MAX MEAN	Sample Date	2020-06-15
			Unit	
pH	6.0 - 9.5	6.0 - 9.5	pH units	7.77
Total Suspended Solids	30	15	mg/L	13
Ammonia	6.0	6.0	mg/L	0.13
Oil & Grease	5 and no visible sheen	5 and no visible sheen	mg/L	1
Arsenic	1	0.5	mg/L	0.0068
Copper	0.6	0.3	mg/L	0.0022
Lead	0.1	0.1	mg/L	0.0003
Nickel	1	0.5	mg/L	0.003
Zinc	1	0.5	mg/L	0.002
Benzene	0.37	0.37	mg/L	<0.0002
Ethylbenzene	0.09	0.09	mg/L	<0.0001
Toluene	0.002	0.002	mg/L	<0.001

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) and (Tanks 7-8; ST-40.3) diesel bulk fuel storage facilities and Jet A secondary tank (ST-38) at the Baker Lake Marshalling Facility were sampled on June 10th, and September 8th, 2020. Notification to the CIRNAC Inspector, made in accordance with Part F, Item 13 of NWB License 2AM-MEA1530 t to empty secondary containment areas, was sent on June 15th and September 4th, 2020 for ST-40.1., ST-40.2., and ST-40.3. In July 2020, 3,272 m^3 was pumped from Tank 1-4, 1,959 m^3 from Tank 5-6, and 2,098 m^3 from Tank 7. In October, 100 m^3 was pumped from Tank 1-4 containment area. The locations of these sampling stations (ST-40.1, ST-40.2, and ST-40.3) are illustrated on Figure 6 and results are presented in Table 8-68.

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 2020" prepared for Agnico by Azimuth Consulting Group, attached as Appendix 33. The results indicate no effects from mine related activities.

Table 8-68 Baker Lake 2020 Bulk Fuel Storage Facility Water Quality Monitoring (ST-40.1, ST-40.2, and ST-40.3)

BULK FUEL	MAX GRAB	MAX MEAN	Sample date	2020-06-10	2020-06-10	2020-06-10	2020-09-08
Parameter			**Unit**	**ST-40.1**	**ST-40.2**	**ST-40.3**	**ST-40.1**
pH	6.0 - 9.5	6.0 - 9.5	pH units	7.65	7.6	8.09	8.08
TSS	30	15	mg/L	7	6	2	3
Total ammonia as NH4	6.0	6.0	mg/L	< 0.01	< 0.01	0.02	< 0.01
Total oil and grease	5 and no visible sheen	5 and no visible sheen	mg/L	2	3	2	2
Arsenic	1	0.5	mg/L	< 0.0005	0.0008	0.001	< 0.0005
Copper	0.6	0.3	mg/L	0.0056	0.0036	0.0031	0.0077
Lead	0.1	0.1	mg/L	< 0.0003	< 0.0003	< 0.0003	< 0.00017
Nickel	1	0.5	mg/L	< 0.0005	0.0011	0.0009	< 0.0005
Zinc	1	0.5	mg/L	< 0.001	0.005	0.002	0.003
Volatile Organics							
Benzene	0.37	0.37	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.00020
Ethylbenzene	0.09	0.09	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.00020
Toluene	0.002	0.002	mg/L	< 0.001	< 0.001	< 0.001	< 0.00020

8.5.5.3 *Whale Tail Site*

No water was discharged from secondary containment of the Whale Tail Bulk Fuel Storage Facility and from the secondary containment of the power plant fuel tank in 2020.

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 2020. This annual inspection is a requirement of the Water License. The findings are presented in the report entitled '2020 Annual Geotechnical Inspection, Meadowbank Gold Mine, Nunavut', attached in Appendix 9. Agnico responses to the recommendations from the inspection are also included in Appendix 15.

* TSM- Biodiversity and Conservation Management

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 2019 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 2021.

Pre-freshet and freshet inspections were conducted at crossings along the AWAR in 2020. These inspections are conducted to document the presence/absence of flow, erosional concerns and turbidity plumes. A total of sixteen (16) inspections were conducted between May 17^{th} and August 20^{th}, 2020. Beginning of June 2020, small streams began flowing and by end of June all of the streams and rivers along the AWAR opened up, no erosional concern or visual turbidity plumes were observed.

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 2020, 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 in 2020. This annual inspection is a requirement of the Water License. The findings are presented in the report entitled ‘Whale Tail Project 2020 Annual Geotechnical Inspection’, attached in Appendix 9. Agnico responses to the recommendations from the inspection are also included in Appendix 15.

Pre-freshet and freshet inspections were conducted at crossings along the Whale Tail Haul Road, eskers and quarries in 2020. 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 sheen and would not impact the environment. A freshet leader was hired in 2020 and was only dedicated, on a daily basis, 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 2020. Refer to Section 8.5.3.2.15 for more details.

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 2020, no visual turbidity plumes or erosion was observed.

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-MEA1530 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-WTP1830 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 or Bureau Veritas (BV) in Ontario, both are accredited facilities. All data from H2Lab and BV lab 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 can be provided on request for Meadowbank and Whale Tail.

All toxicity and sublethal tests were performed 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. Toxicity reports for Meadowbank and Whale Tail can be provided on request.

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. Trip blank are laboratory pre-filed bottles with DI water carried to the sampling location and are left unopened. 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 July 2020 and the new version 6 is provided in Appendix 54.

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, 6 field blanks and 5 trip blanks were collected from a total of 34 samples, representing 17.64 %;

- STP monitoring program: 6 duplicate samples, 6 trip blanks and 3 field blanks were collected from a total of 36 samples, representing 16.67%;

- Surface water monitoring programs: 33 duplicate samples, 36 field blanks and 25 trip blanks were collected from a total of 128 samples, representing 32.0%; and

- Bulk fuel storage facilities monitoring program: 3 duplicate and 3 field blanks samples were collected from a total of 4 samples, representing 75.0%.

This represents approximately 27.7% 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 8-69 to 8-93 for the MDMER and EEM, Surface Water, STP 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 8-69 and 8-70): All the duplicate samples collected were considered as having high analytical precision.

- Surface Water (Tables 8-71 – 8-91): All QAQC sampling events conducted within the surface water quality program are rated as having high analytical precision (for duplicate and parent samples) except for 2 samples having a medium analytical precision of 10% and 11%.

- STP (Table 8-92): Analytical precision is rated high for all sampling events except for 2 sampling events with one having medium analytical precision at 25% and one having a low analytical precision of 29%. However, as the number of parameters analysed is low, one sample with notable variation between field and duplicate and field bank and lab blank samples will trigger a medium or low analytical precision.

- Bulk Fuel Storage Facility (Table 8-93): Analytical precision is rated high for the duplicate sampling event conducted at the Bulk Storage Facility.

RPD values were also calculated for field blanks and lab blanks in 2020 as part of the updated QAQC plan submitted in July 2020. All field blank samples are considered to have high analytical precision.

The QA/QC plan was followed and samples were collected by qualified technicians. Given the high number of samples collected in 2020, 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 2020. 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.

Each equipment used for field measurement are calibrated prior each usage. Calibration datasheet are kept for future reference, if needed.

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 33: *Core Receiving Environment Monitoring Program 2020* – Sections 3;
- Appendix 42: *2020 Groundwater Monitoring Report* – Sections 3.2 and 4.6;
- Appendix 46: *Air Quality and Dustfall Monitoring Report 2020* – Section 4.4.

Table 8-69 Meadowbank 2020 MDMER QAQC (ST-MMER-3)

Parameter	Sample date		1/6/2020						2/17/2020							3/23/2020						
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
TSS	mg/L	1	1	1	1	2	**66.67**	0.00	1	1	1	4	2	**66.67**	0.00	1	1	1	3	2	**40.00**	0.00
Aluminum	mg/L	0.006	0.006	0.006	0.04	0.039	2.53	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/L	0.0005 / 0.0001*	0.0005	-	0.0017	0.0021	**21.05**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/L	0.0005	0.0005	-	0.0018	0.0022	**20.00**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/L	0.0003 / 0.002*	0.0003	-	0.0003	0.0003	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/L	0.0005 / 0.001*	0.0005	-	0.0009	0.0009	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/L	0.001 / 0.005*	0.002	-	0.003	0.004	**28.57**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Radium-226	Bq/l	0.002 / 0.005*	0.002	0.002	0.005	0.002	**85.71**	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Exceedance**							**0%**	**0%**						**0%**	**0%**						**0%**	**0%**

Parameter	Sample date		5/4/2020							11/2/2020							07/12/2020 *			12/14/2020				
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Duplicate	Original	RPD (FD/N)	Trip Blank	Field Blank	Lab Blank	Original	RPD (FB/LB)
TSS	mg/L	1	1	1	1	2	2	0.00	0.00	1	1	1	5	4	**22.22**	0.00	1	2	**66.67**	1	1	1	12	0.00
Aluminum	mg/L	0.006	-	-	-	-	0.02	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/L	0.0005 / 0.0001*	-	-	-	-	0.0006	-	-	-	-		-	-	-	-	0.00097	0.001	3.05	-	-	-	-	-
Copper	mg/L	0.0005	-	-	-	-	0.0034	-	-	-	-		-	-	-	-	0.00148	0.00155	4.62	-	-	-	-	-
Lead	mg/L	0.0003 / 0.002*	-	-	-	-	0.0003	-	-	-	-		-	-	-	-	0.00025	0.00027	7.69	-	-	-	-	-
Nickel	mg/L	0.0005 / 0.001*	-	-	-	-	0.0005	-	-	-	-		-	-	-	-	0.001	0.001	0.00	-	-	-	-	-
Zinc	mg/L	0.001 / 0.005*	-	-	-	-	0.003	-	-	-	-		-	-	-	-	0.005	0.0054	7.69	-	-	-	-	-
Radium-226	Bq/l	0.002 / 0.005*	-	-	-	-	0.01	-	-	-	-		-	-	-	-	0.005	0.005	0.00	-	-	-	-	-
% Exceedance**								**0%**	**0%**						**0%**	**0%**			**0%**					**0%**

Footnotes:

*Different MDL after Dec 7 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-70 Meadowbank 2020 EEM QAQC (ST-MMER-3-EEM-SPLE and ST-MMER-1-TPS)

ST-MMER-3-EEM-SPLE	Sample date	MDL	1/21/2020							11/15/2020					
	Sample type		Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (N/FD)	RPD (FB/LB)	Field Blank	Lab Blank	Duplicate	Original	RPD (N/FD)	RPD (FB/LB)
Parameter	Unit														
Conventional Parameters															
pH	pH units	0	5.42	5.46	-	7.05	7.02	0.43	-	5.66	-	7.19	7.15	0.56	-
Hardness	mg CaCO3/L	1	1	1	1	17	22	25.64	0.00	1	1.00	16.00	16	0.00	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	5	16	29	12	48	29	**49.35**	**82.93**	25	-	49.00	49	0.00	-
Total Suspended Solids	mg/L	1	1	1	1	1	1	0.00	0.00	1	1.00	1.00	1	0.00	0.00
Major Ions															
Chloride	mg/L	0.5	0.5	0.5	0.5	0.8	0.9	11.76	0.00	0.5	0.5	0.80	0.9	11.76	0.00
Sulphate	mg/L	0.6	1.2	2.3	0.6	10.2	6.9	38.60	**117.24**	0.6	3.68	4.80	4.6	4.26	**143.93**
Cyanide	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.003	0.00	0.001	0.00	**100.00**
Nutrients and Chlorophyll a															
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	0.01	0.01	0.02	**66.67**	0.00	0.01	0.01	0.01	0.01	0.00	0.00
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
Nitrite	mg N/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate + nitrite	mg N/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.00	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.04	0.04	0.04	0.04	0.00	0.00
Total Metals															
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.005	0.006	0.005	0.005	0.00	18.18
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0016	0.0006	90.91	0.00	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0007	**33.33**	0.00	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Iron	mg/L	0.01	0.02	0.03	0.01	0.02	0.02	0.00	**100.00**	0.01	0.01	0.01	0.01	0.00	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.0008	0.0011	**31.58**	0.00	0.0005	0.0005	0.0005	0.0007	**33.33**	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0016	0.0005	0.0005	0.0005	0.00	**104.76**	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0006	0.0023	**117.24**	0.00	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.0005	0.001	0.0005	0.0005	0.00	**66.67**
Thallium	mg/L	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.00	0.00	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Uranium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.00	0.00
Zinc	mg/L	0.001	0.001	0.001	-	0.001	0.003	**100.00**	-	0.001	0.001	0.001	0.001	0.00	0.00
Radionuclides															
Radium-226	Bq/l	0.002	0.004	0.004	0.002	0.002	0.002	0.00	**66.67**	-	-	-	-	-	-
% Exceedance*								**6.67%**	**0%**					**0%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

N = Parent sample (original sample)

FD = Field Duplicate

FB = Field Blank

LB = Lab Blank

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Water Quality Monitoring Reference Area Third Portage Lake (ST-MMER-3-EEM-TPS)														
Parameter	Sample date	MDL	1/21/2020							15/11/2020*				
	Sample type		Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (N/FD)	RPD (FB/LB)	Field Blank	Lab Blank	Duplicate	Original	RPD (N/FD)	RPD (FB/LB)
	Unit														
Conventional Parameters														
Hardness	mg CaCO3/L	1	1	1	1	13	13	0.00	0.00	1	1	10	10	0.00	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	5	26	28	12	24	47	**64.79**	**80.00**	25	-	48	31	**43.04**	-
TSS	mg/L	1	1	1	1	1	1	0.00	0.00	1	1	1	1	0.00	0.00
Major Ions														
Chloride	mg/L	0.5	0.5	0.5	0.5	0.9	0.9	0.00	0.00	0.5	0.5	0.7	0.8	13.33	0.00
Sulphate	mg/L	0.6	0.8	0.6	0.6	6.4	7.4	14.49	0.00	0.6	3.68	7.7	3.6	*72.57*	**143.93**
Cyanide	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.003	0.001	0.001	0.00	**100.00**
Nutrients and Chlorophyll a														
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
Total phosphorus	mg/L	0.01/0.04*	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.04	0.04	0.04	0.04	0.00	0.00
Total Metals														
Aluminum	mg/L	0.006/0.005*	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.005	0.006	0.005	0.005	0.00	18.18
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
Lead	mg/L	0.0003/0.00017*	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.0008	0.001	**22.22**	0.00	0.0005	0.0005	0.0006	0.0011	**58.82**	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0011	0.0005	0.0005	0.0006	18.18	75.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0006	0.0006	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Selenium	mg/L	0.001/0.005*	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.0005	0.001	0.0005	0.0005	0.00	**66.67**
Thallium	mg/L	0.0008/0.0002*	0.0008	0.0008	0.0008	0.0008	0.0008	0.00	0.00	0.0006	0.0008	0.0002	0.0002	0.00	**28.57**
Uranium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.002	0.001	0.001	0.001	0.00	**66.67**
Zinc	mg/L	0.001	0.001	0.001	-	0.002	0.002	0.00	-	0.001	0.001	0.001	0.001	0.00	0.00
Radionuclides														
Radium-226	Bq/l	0.002	0.003	0.003	0.002	0.004	0.007	**54.55**	**40.00**	0.002	0.002	0.002	0.002	0.00	0.00
% Exceedance**								0%	0%					0%	0%

*Different MDL after Nov 15 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

N = Parent sample (original sample)

FD = Field Duplicate

FB = Field Blank

LB = Lab Blank

Table 8-71 Meadowbank 2020 Non-Contact Water Diversion Ditch QAQC (ST-5)

Parameter	Sample date		7/6/2020						8/4/2020		10/5/2020						
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Original	Trip Blank	Field Blank	Lab Blank	Duplicate	Original*	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																	
TSS	mg/L	1	1	1	2	3	**40.00**	0.00	1	3	3	2	1	6	3	**66.67**	**66.67**
Major Ions																	
Sulphate	mg/L	0.6	0.6	0.6	15.4	16.2	5.06	0.00	0.6	31.4	1.2	0.6	0.6	33.1	35.4	6.72	0.00
Cyanide	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Total Metals																	
Aluminum	mg/L	0.006	0.006	0.006	0.025	0.02	**22.22**	0.00	0.006	0.016	0.005	0.005	0.006	0.009	0.021	**80.00**	18.18
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.001	0.0005	0.0005	0.0005	0.0009	0.0009	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0027	0.0025	7.69	0.00	0.0005	0.0036	0.0005	0.0005	0.0005	0.0037	0.004	7.79	0.00
Lead	mg/L	0.0003/0.00017*	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.0003	0.0003	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Nickel	mg/L	0.0005	0.0005	0.0005	0.0038	0.0044	14.63	0.00	0.0005	0.0062	0.0005	0.0005	0.0005	0.0106	0.0101	4.83	0.00
Zinc	mg/L	0.001	0.001	0.001	0.004	0.017	*123.81*	0.00	0.001	0.001	0.013	0.001	0.001	0.001	0.001	0.00	0.00
Radionuclides																	
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.002	0.00	0.00	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.00	0.00
% Exceedance**							**0%**	**0%**								**0%**	**0%**

Footnotes:

*Different MDL after Oct 5 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-72 Meadowbank 2020 Non-Contact Water Diversion Ditch QAQC (ST-6)

Parameter	Sample date		6/17/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters									
TSS	mg/L	1	1	1	1	27	26	3.77	0.00
Major Ions									
Sulphate	mg/L	0.6	0.6	0.6	0.6	6.4	7.1	10.37	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.002	0.002	0.00	0.00
Total Metals									
Aluminum	mg/L	0.006	0.006	0.006	0.006	1.095	1.158	5.59	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0026	0.0026	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.006	0.0062	3.28	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0099	0.0103	3.96	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.011	0.016	37.04	0.00
Radionuclides									
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.002	0.002	0.00	0.00
% Exceedances*								**10%**	

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

Result below DL were considered as the value of the DL for the RPD calculation

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-73 Meadowbank 2020 East Dike Seepage Discharge QAQC (ST-8)

Parameter	Sample date		3/2/2020							02/11/2020*						07/12/2020 **			14/12/2020*			
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Duplicate	Original	RPD (FD/N)	Field Blank	Lab Blank	Original	RPD (FB/LB)
Conventional Parameters																						
TSS	mg/L	1	1	1	1	3	3	0.00	0.00	5	1	3	2	**40.00**	**133.33**	1	2	**66.67**	1	1	4	0.00
Major Ions																						
Sulphate	mg/L	0.6/0*	0.6	0.6	0.6	5.8	6.2	6.67	0.00	0	-	6.50	6.50	0.00	-	5.9	5.9	0.00	0.6	0.6	5.9	0.00
Cyanide	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.00	0.00	0.053	0.005	*165.52*	0.001	0.001	0.001	0.00
Total Metals																						
Aluminum	mg/L	0.006/0.005*	0.006	0.006	0.006	0.047	0.017	**93.75**	0.00	0.005	0.006	0.036	0.036	0.00	18.18	-	-	-	0.005	0.006	0.066	18.18
Arsenic	mg/L	0.0005/0.0001**	0.0005	0.0005	-	0.0012	0.0005	**82.35**	-	0.0005	0.0005	0.0008	0.0010	**22.22**	0.00	0.00097	0.001	3.05	0.0005	0.0005	0.0011	0.00
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0021	0.0016	**27.03**	-	0.0005	0.0005	0.0013	0.0006	**73.68**	0.00	0.00148	0.00155	4.62	0.0005	0.0005	0.0005	0.00
Lead	mg/L	0.0003/0.00017*/ 0.0002**	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.00017	0.0003	0.00080	0.00060	**28.57**	**55.32**	0.00025	0.00027	7.69	0.00017	0.0003	0.00017	**55.32**
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.001	0.001	0.00	0.0005	0.0005	0.0005	0.00
Zinc	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.00	0.00	0.005	0.0054	7.69	0.001	0.001	0.001	0.00
Radionuclides																						
Radium-226	Bq/l	0.002/0.005**	0.002	0.006	0.002	0.002	0.008	**120.00**	**100.00**	0.002	0.002	0.002	0.002	0.00	0.00	0.005	0.005	0.00	0.003	0.002	0.002	**40.00**
% Exceedance* **								**0%**	**0%**					**0%**	**0%**			**0%**				**0%**

Footnotes:

*Different MDL after Nov 2 2020.

**Different MDL in Dec 14 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

*** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-74 Meadowbank 2020 Portage RSF QAQC (ST-16)

Parameter	Sample date		7/13/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters									
Hardness	mg CaCO3/L	1	1	1	1	125	113	10.08	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	5	7	7	12	67	67	0.00	**52.63**
Total Suspended Solids	mg/L	1	1	1	1	2	2	0.00	0.00
Total Dissolved Solids	mg/L	1	6	1	0.2	158	156	1.27	**133.33**
Major Ions									
Chloride	mg/L	0.5	0.5	0.5	0.5	2.1	1.7	**21.05**	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.02	0.17	0.17	0.00	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	50.8	51.1	0.59	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Nutrients and Chlorophyll a									
Total ammonia as NH4	mg N/L	0.05	0.05	0.05	0.05	0.05	0.05	0.00	0.00
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Nitrate	mg N/L	0.01	0.01	0.01	0.01	1.82	2.29	22.87	0.00
Nitrite	mg N/L	0.01	0.01	0.01	0.01	0.02	0.03	**40.00**	0.00
Total Metals									
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.044	0.026	**51.43**	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0302	0.0268	11.93	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0131	0.0119	9.60	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Calcium	mg/L	0.03	0.03	0.03	0.03	28.6	25.8	10.29	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0007	0.0008	13.33	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0101	0.0093	8.25	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.24	0.24	0.00	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Magnesium	mg/L	0.02	0.02	0.02	0.02	12.95	11.80	9.29	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.0236	0.0225	4.77	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0209	0.0175	17.71	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0090	0.0085	5.71	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00
% Exceedance*								**6.1%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

Result below DL were considered as the value of the DL for the RPD calculation

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-75 Meadowbank 2020 North Portage Pit Lake QAQC (ST-17)

Parameter	Sample date		7/8/2020						08/12/2020*						
			ST-17 Lake						ST-17						
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters															
Hardness	mg CaCO3/L	1	1	1	628	610	2.91	0.00	1	1	1	878	894	1.81	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	5	7	12	66	66	0.00	**52.63**	15	18	-	98	99	1.02	-
Total acidity	mg/L	5	5	12	14	5	**94.74**	**82.35**	-	-		-	-	-	-
Total Suspended Solids	mg/L	1	1	1	2	2	0.00	0.00	1	1	1	8	13	*47.62*	0.00
Total Dissolved Solids	mg/L	1	2	12	1145	1115	2.65	*142.86*	1	2	-	1516	1519	0.20	-
Total organic carbon	mg/L	0.2	-	-	-	-	-	-	0.2	0.2	0.2	22.3	21.8	2.27	0.00
Dissolved organic carbon	mg/L	0.2	0.2	-	11	13	16.67	-	1.0	1.2	0.2	23.3	23.5	0.85	**142.86**
Major Ions															
Chloride	mg/L	0.5	0.5	0.5	141.1	132.9	5.99	0.00	0.5	0.5	0.5	152.0	152.2	0.13	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.23	0.15	*42.11*	0.00	0.02	0.02	0.02	0.33	0.33	0.00	0.00
Sulphate	mg/L	0.6	0.6	0.6	586	573	2.24	0.00	0.6	0.6	0.6	968	1010	4.25	0.00
Cyanide (free)	mg/L	0.001	0.001	0.1	0.021	0.018	15.38	*196.04*	0.001	0.001	0.1	0.035	0.038	8.22	196.04
Cyanide	mg/L	0.001	0.003	0.001	0.062	0.053	15.65	**100.00**	0.001	0.002	0.001	0.072	0.070	2.82	66.67
Nutrients and Chlorophyll a															
Total ammonia as NH4	mg N/L	0.01	0.01	-	12.94	12.92	0.15	-	0.02	0.01	0.01	17.94	17.93	0.06	0.00
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	0.28	0.27	3.64	0.00	0.01	0.01	0.01	0.49	0.51	4.00	0.00
Nitrate	mg N/L	0.01	0.04	0.1	3.05	2.74	10.71	*85.71*	0.01	0.01	0.01	4.54	3.94	14.15	0.00
Nitrite	mg N/L	0.01	0.01	-	0.22	0.22	0.00	-	0.01	0.01	0.01	0.19	0.16	17.14	0.00
Total nitrogen	mg N/L	0.05	-	-	-	-	-	-	0.05	0.11	0.05	45	45	0.00	75.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total Metals															
Aluminum	mg/L	0.006	0.006	0.006	0.041	0.054	**27.37**	0.00	0.006	0.006	0.006	0.051	0.051	0.00	0.00
Arsenic	mg/L	0.0005	0.0018	0.0005	0.3839	0.3449	10.70	**113.04**	0.0005	0.0043	0.0005	0.7049	0.7639	8.03	**158.33**
Barium	mg/L	0.0005	0.0005	0.0005	0.0539	0.0535	0.74	0.00	0.0005	0.0005	0.0005	0.0620	0.0628	1.28	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0007	0.0007	0.00	0.00	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.001	0.0005	0.787	0.741	6.02	**66.67**	0.0035	0.0089	0.0005	1.58	1.60	1.26	*178.72*
Iron	mg/L	0.01	0.01	0.01	0.17	0.15	12.50	0.00	0.01	0.01	0.01	0.35	0.37	5.56	0.00
Lead	mg/L	0.0003/0.00017*	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Manganese	mg/L	0.0005	0.0005	0.0005	0.1912	0.188	1.69	0.00	0.0005	0.0008	0.0005	0.2953	0.3107	5.08	**46.15**
Mercury	mg/L	0.00001	0.00001	0.00001	0.00002	0.00001	**66.67**	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0948	0.092	3.00	0.00	0.0005	0.0005	0.0005	0.1204	0.1182	1.84	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.1323	0.1245	6.07	0.00	0.0015	0.0025	0.0005	0.1706	0.1754	2.77	**133.33**

Parameter	Sample date		7/8/2020						08/12/2020*						
	Unit	MDL	ST-17 Lake						ST-17						
			Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Selenium	mg/L	0.001	0.001	-	0.018	0.02	10.53	-	0.001	0.001	0.001	0.046	0.038	19.05	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0008	0.0012	*40.00*	0.00
Thallium	mg/L	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Dissolved Metals															
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.006	0.006	0.006	0.006	0.006	0.00	0.00
Arsenic	mg/L	0.0005	0.0016	-	0.3838	0.3763	1.97	-	0.0005	0.0034	0.0005	0.5456	0.5606	2.71	**148.72**
Barium	mg/L	0.0005	0.0005	-	0.0516	0.0612	17.02	-	0.0005	0.0005	0.0005	0.0564	0.0589	4.34	0.00
Cadmium	mg/L	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	-	0.6117	0.5507	10.50	-	0.0005	0.0015	0.0005	0.9420	0.9296	1.33	**100.00**
Iron	mg/L	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Lead	mg/L	0.0003/0.00017*	0.0003	-	0.0003	0.0003	0.00	-	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Manganese	mg/L	0.0005	0.0005	-	0.1562	0.1462	6.61	-	0.0005	0.0005	0.0005	0.2880	0.2606	9.99	0.00
Mercury	mg/L	0.00001	0.00001	-	0.00001	0.00001	0.00	-	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	-	0.0834	0.0814	2.43	-	0.0005	0.0005	0.0005	0.1124	0.1085	3.53	0.00
Nickel	mg/L	0.0005	0.0005	-	0.1299	0.1153	11.91	-	0.0005	0.0005	0.0005	0.1496	0.1479	1.14	0.00
Selenium	mg/L	0.001	0.001	-	0.018	0.012	40.00	-	0.001	0.001	0.001	0.036	0.034	5.71	0.00
Silver	mg/L	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001	0.0001	0.0006	0.0005	18.18	0.00
Strontium	mg/L	0.005	0.005	-	0.603	0.537	11.58	-	0.005	0.005	0.005	0.731	0.711	2.77	0.00
Thallium	mg/L	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00
% Exceedance**							**2%**	**0%**						**0%**	**0%**

Footnotes:

*Different MDL after Aug 12 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-76 Meadowbank 2020 South Portage Pit Lake QAQC (ST-19/ST-19 Lake)

Parameter	Sample date		8/18/2020					9/8/2020						
	Unit	MDL	ST-19					ST-19 Lake						
			Trip Blank	Field Blank	Lab Blank	Original	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters														
Hardness	mg CaCO3/L	1	1	1	1	871	0.00	1	1	1	971	1026	5.51	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	5	33	90	12	90	*152.94*	16	5	12	82	83	1.21	**82.35**
Total acidity	mg/L	5	5	5	12	5	**82.35**	5	12	12	5	9	**57.14**	0.00
Total Suspended Solids	mg/L	1	1	1	1	1	0.00	1	1	1	18	17	5.71	0.00
Total organic carbon	mg/L	0.2	0.2	0.2	0.2	18.7	0.00	-	-	-	-	-	-	-
Dissolved organic carbon	mg/L	0.2	0.8	0.9	0.2	17.7	**127.27**	1.1	1.3	0.2	27.2	26.9	1.11	**146.67**
Total Dissolved Solids	mg/L	1	1	2	12	17	*142.86*	3	34	12	1992	1993	0.05	95.65
Major Ions														
Chloride	mg/L	0.5	0.5	0.5	0.5	200.0	0.00	0.5	0.5	0.5	251.4	245.3	2.46	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.02	0.39	0.00	0.02	0.02	0.02	0.35	0.35	0.00	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	1150	0.00	0.6	0.6	0.6	1390	1400	0.72	0.00
Cyanide (free)	mg/L	0.001	0.001	0.001	0.1	0.018	*196.04*	0.001	0.001	0.1	0.044	0.040	9.52	*196.04*
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.049	0.00	0.001	0.001	0.001	0.075	0.069	8.33	0.00
Nutrients and Chlorophyll a														
Total ammonia as NH4	mg N/L	0.01	0.01	0.02	0.01	14.72	**66.67**	0.01	0.03	0.01	29.72	28.78	3.21	**100.00**
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.28	0.00	0.01	0.01	0.01	1.24	1.15	7.53	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.01	2.04	0.00	0.01	0.01	0.01	5.80	6.33	8.74	0.00
Nitrite	mg N/L	0.01	0.01	0.01	0.01	0.08	0.00	0.01	0.01	0.01	0.14	0.13	7.41	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.06	0.01	0.01	0.00	**142.86**
Total Metals														
Aluminum	mg/L	0.006	0.006	0.006	-	0.019	-	0.006	0.006	0.006	0.091	0.211	79.47	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.0108	-	0.0005	0.0063	0.0005	0.8197	0.8886	8.07	*170.59*
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0292	0.00	0.0005	0.0005	0.0005	0.0970	0.0992	2.24	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.0006	0.0006	0.0006	0.0021	0.0024	13.33	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0028	0.00	0.0005	0.0005	0.0005	0.199	0.206	3.46	0.00
Iron	mg/L	0.01	0.01	0.01	-	0.07	-	0.01	0.01	0.01	0.50	0.53	5.83	0.00
Lead	mg/L	0.00017	0.00017	0.00017	-	0.00017	-	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	1.3510	0.00	0.0005	0.0005	0.0005	0.0821	0.0863	4.99	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.1804	0.00	0.0005	0.0007	0.0005	0.1783	0.1881	5.35	**33.33**
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0338	-	0.0005	0.0005	0.0005	0.1363	0.1416	3.81	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.073	0.077	5.33	0.00
Silver	mg/L	0.0001	0.0001	0.0001	-	0.0001	-	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00

Parameter	Sample date		8/18/2020					9/8/2020						
	Unit	MDL	ST-19					ST-19 Lake						
			Trip Blank	Field Blank	Lab Blank	Original	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Strontium	mg/L	0.005	0.005	0.005	-	0.924	-	0.005	0.005	0.005	0.870	0.952	9.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	-	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Dissolved Metals														
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.00	0.006	0.006	0.006	0.008	0.012	**40.00**	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0012	0.00	0.0005	0.0061	0.0005	0.7991	0.7202	10.39	*169.70*
Barium	mg/L	0.0005	0.0005	0.0005	-	0.0201	-	0.0005	0.0019	0.0005	0.0959	0.0910	5.24	**116.67**
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00002	-	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0006	0.0005	0.1949	0.1990	2.08	18.18
Iron	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Lead	mg/L	0.00017	0.00017	0.00017	0.0003	0.00017	**55.32**	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	1.2296	0.00	0.0005	0.0005	0.0005	0.0770	0.0713	7.69	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.1618	-	0.0005	0.0008	0.0005	0.1793	0.1702	5.21	**46.15**
Selenium	mg/L	0.001	0.001	0.001	-	0.001	-	0.001	0.001	0.001	0.072	0.072	0.00	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Strontium	mg/L	0.005	0.005	0.005	-	0.995	-	0.005	0.005	0.005	0.830	0.832	0.24	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	-	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
% Exceedance*							**0%**						**2%**	**3%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-77 Meadowbank 2020 Goose Pit Lake QAQC (ST-20 Lake)

Parameter	Sample date		6/18/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters									
Total alkalinity, as CaCO3	mg CaCO3/L	2	4	5	5	31	26	17.54	0.00
Total Suspended Solids	mg/L	1	1	1	1	13	6	*73.68*	0.00
TDS	mg/L	2	12	12	1	452	439	2.92	**169.23**
Total organic carbon	mg/L	0.2	0.4	0.3	-	4.8	4.8	0.00	-
Dissolved organic carbon	mg/L	0.2	0.5	0.7	-	5	5	0.00	-
Carbonate	mg/L	2	2	2	5	2	2	0.00	**85.71**
Bicarbonate	mg/L	2	4	5	5	31	26	17.54	0.00
Major Ions									
Chloride	mg/L	0.5	0.5	0.5	0.5	45.4	22	69.44	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.02	0.25	0.25	0.00	0.00
Reactive silica	mg/L	0.01	0.01	0.01	-	3.54	3.85	8.39	-
Sulphate	mg/L	0.6	0.6	0.6	0.6	182	176	3.35	0.00
Thiocyanate	mg/L	0.05	0.05	0.05	0.05	15	15.2	1.32	0.00
Cyanate	mg/L	0.01	0.01	0.01	0.01	18.7	19.2	2.64	0.00
Cyanide	mg/L	0.001	0.001	0.002	0.001	0.058	0.065	11.38	**66.67**
Nutrients and Chlorophyll a									
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	0.01	5.16	5.21	0.96	0.00
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.05	0.05	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.01	1.12	1.04	7.41	0.00
Nitrite	mg N/L	0.01	0.01	0.01	0.01	0.06	0.05	18.18	0.00
Total nitrogen	mg N/L	0.05	0.05	0.05	0.05	10	9.8	2.02	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.08	0.05	**46.15**	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.02	0.02	0.01	0.08	0.08	0.00	**66.67**
Total Metals									
Aluminum	mg/L	0.006	0.052	0.006	0.006	0.092	0.124	29.63	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.1154	0.1587	31.59	-
Barium	mg/L	0.0005	0.0005	0.0005	-	0.0234	0.026	10.53	-
Beryllium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Boron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Cadmium	mg/L	0.0000200	0.00002	0.00002	-	0.00002	0.00002	0.00	-
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0006	0.0006	0.00	-
Cobalt	mg/L	0.0005	0.0005	0.0005	-	0.0555	0.0614	10.09	-
Copper	mg/L	0.0005	0.0005	0.0013	-	0.79	0.865	9.06	-
Iron	mg/L	0.01	0.14	0.01	-	0.26	0.28	7.41	-
Lead	mg/L	0.0003	0.0003	0.0003	-	0.0003	0.0003	0.00	-
Lithium	mg/L	0.005	0.005	0.005	-	0.005	0.005	0.00	-
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.043	0.0635	38.50	-
Mercury	mg/L	0.0000100	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00

Parameter	Sample date		6/18/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0231	0.0235	1.72	-
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0529	0.0565	6.58	-
Selenium	mg/L	0.001	0.001	0.001	-	0.004	0.008	**66.67**	-
Silver	mg/L	0.0001	0.0001	0.0001	-	0.0001	0.0001	0.00	-
Strontium	mg/L	0.005	0.005	0.005	-	0.19	0.2	5.13	-
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Tin	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Titanium	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Uranium	mg/L	0.001	0.001	0.001	-	0.002	0.002	0.00	-
Vanadium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Zinc	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Dissolved Metals									
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.006	0.00	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	-	0.0003	0.0001	**100.00**	-
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.1257	0.1055	17.47	-
Barium	mg/L	0.0005	0.0005	0.0005	-	0.0223	0.0166	29.31	-
Beryllium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Boron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Cadmium	mg/L	0.0000200	0.00002	0.00002	-	0.00002	0.00002	0.00	-
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0006	0.0006	0.00	-
Copper	mg/L	0.0005	0.0005	0.0005	-	0.1355	0.1403	3.48	-
Iron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Lead	mg/L	0.0003	0.0003	0.0003	-	0.0003	0.0003	0.00	-
Lithium	mg/L	0.005	0.005	0.005	-	0.005	0.005	0.00	-
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.0432	0.0412	4.74	-
Mercury	mg/L	0.0000100	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0211	0.0172	20.37	-
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0482	0.0398	19.09	-
Selenium	mg/L	0.001	0.001	0.001	-	0.006	0.004	**40.00**	-
Silver	mg/L	0.0001	0.0001	0.0001	-	0.0001	0.0001	0.00	-
Strontium	mg/L	0.005	0.005	0.005	-	0.174	0.147	16.82	-
Titanium	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Uranium	mg/L	0.001	0.001	0.001	-	0.003	0.002	**40.00**	-
Vanadium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Zinc	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
% Exceedance*								**8%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-78 Meadowbank 2020 Goose Pit Sump QAQC (ST-20 Sump)

Parameter	Sample date		7/8/2020						11/08/2020*		10/09/2020*	
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Field Blank	Original	Field Blank	Original
Conventional Parameters												
Total suspended solids	mg/L	1	1	1	2	2	0.00	0.00	1	3	1	10
Total dissolved solids	mg/L	1	1	12	250	252	0.80	*169.23*	1	284	1	298
Major Ions												
Chloride	mg/L	0.5	0.5	0.5	6.2	5.8	6.67	0.00	0.5	6.8	0.5	7.6
Fluoride	mg/L	0.02	0.02	0.02	0.18	0.18	0.00	0.00	0.02	0.25	0.08	0.27
Sulphate	mg/L	0.6	0.6	0.6	107	106	0.94	0.00	0.6	140	0.6	161
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.002	**66.67**	0.00	0.001	0.001	0.001	0.001
Nutrients and Chlorophyll a												
Total ammonia as NH4	mg N/L	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.04
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01
Nitrate	mg N/L	0.01	0.01	0.01	4.36	4.27	2.09	0.00	0.01	4.49	0.01	4.66
Nitrite	mg N/L	0.01	0.01	-	0.02	0.02	0.00	-	0.02	0.02	0.01	0.01
Total Metals												
Aluminum	mg/L	0.006	0.006	0.006	0.043	0.032	**29.33**	0.00	0.006	0.006	0.006	0.152
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0016	0.0016	0.00	0.00	0.0005	0.0065	0.0005	0.0094
Barium	mg/L	0.0005	0.0005	0.0005	0.0247	0.0276	11.09	0.00	0.0005	0.0048	0.0005	0.0219
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	0.00002	0.00002
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	0.0006	0.0006	0.0017
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0042	0.0005	0.0029
Iron	mg/L	0.01	0.01	0.01	0.08	0.08	0.00	0.00	0.01	0.03	0.01	0.30
Lead	mg/L	0.0003/ 0.00017*	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.00017	0.00017	0.00017	0.00017
Manganese	mg/L	0.0005	0.0005	0.0005	0.0321	0.0378	16.31	0.00	0.0005	0.0088	0.0005	0.0368
Mercury	mg/L	0.00001	0.00003	0.00001	0.00001	0.00001	0.00	**100.00**	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0035	0.0039	10.81	0.00	0.0005	0.0042	0.0005	0.0042
Nickel	mg/L	0.0005	0.0005	0.0005	0.1002	0.1103	9.60	0.00	0.0005	0.0905	0.0005	0.0993
Selenium	mg/L	0.001	0.001	0.001	0.002	0.001	**66.67**	0.00	0.001	0.001	0.001	0.001
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001

Parameter	Sample date		7/8/2020						11/08/2020*		10/09/2020*	
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Field Blank	Original	Field Blank	Original
Thallium	mg/L	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**	0.0002	0.0002	0.0002	0.0002
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001
Dissolved Metals												
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.006	0.006	0.006	0.006
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0015	0.0012	**22.22**	0.00	0.0005	0.0039	0.0005	0.0090
Barium	mg/L	0.0005	0.0005	0.0005	0.0202	0.0194	4.04	0.00	0.0005	0.0005	0.0005	0.0211
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	0.00002	0.00010
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	0.0006	0.0006	0.0006
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0016	0.0005	0.0016
Iron	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01
Lead	mg/L	0.0003/ 0.00017*	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.00017	0.00017	0.00017	0.00017
Manganese	mg/L	0.0005	0.0005	0.0005	0.0150	0.0125	18.18	0.00	0.0005	0.0024	0.0005	0.0015
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0030	0.0029	3.39	0.00	0.0005	0.0028	0.0005	0.0043
Nickel	mg/L	0.0005	0.0005	0.0005	0.0833	0.0804	3.54	0.00	0.0005	0.0750	0.0005	0.0851
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.002
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001
Thallium	mg/L	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**	0.0002	0.0002	0.0002	0.0002
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001
% Exceedance**							**0%**	**0%**				

Footnotes:

*Different MDL after Aug 11 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-79 Meadowbank 2020 TSF Reclaim Water QAQC (ST-21)

Parameter	Sample Date		6/18/2020				07/09/2020*			
	Unit	MDL	Trip Blank	Duplicate	Original	RPD (FD/N)	Field Blank	Lab Blank	Original	RPD (FB/LB)
Conventional Parameters										
Total alkalinity, as CaCO3	mg CaCO3/L	2/5*	4	45	38	16.87	18	12	105	**40.00**
Total Suspended Solids	mg/L	1	2	13	14	7.41	1	1	39	0.00
Total Dissolved Solids	mg/L	2/1*	12	538	530	1.50	2	12	873	*142.86*
Dissolved organic carbon	mg/L	0.2	0.6	4.1	4.2	2.41	1.1	-	2.7	-
Major Ions										
Chloride	mg/L	0.5	0.5	35.7	35.7	0.00	0.5	0.5	35.9	0.00
Fluoride	mg/L	0.02	0.02	0.16	0.15	6.45	0.02	0.02	0.32	0.00
Sulphate	mg/L	0.6	0.6	289	274	5.33	0.6	0.6	439	0.00
Cyanide (free)	mg/L	0.001	0.001	0.006	0.005	18.18	0.001	0.1	0.003	*196.04*
Cyanide	mg/L	0.001	0.001	0.016	0.015	6.45	0.001	0.006	0.017	**142.86**
Nutrients and Chlorophyll a										
Total ammonia as NH4	mg N/L	0.01	0.01	4.49	4.21	6.44	0.01	0.01	5.83	0.00
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.06	0.05	18.18	0.01	0.01	0.12	0.00
Nitrate	mg N/L	0.01	0.01	0.99	1.02	2.99	0.01	0.01	8.25	0.00
Nitrite	mg N/L	0.01	0.01	0.04	0.04	0.00	0.01	0.01	0.44	0.00
Total Metals										
Aluminum	mg/L	0.006	0.006	0.423	0.333	23.81	0.006	0.006	0.520	0.00
Arsenic	mg/L	0.0005	0.0005	0.0112	0.0107	4.57	0.0005	0.0005	0.0215	0.00
Barium	mg/L	0.0005	0.0005	0.0152	0.0154	1.31	0.0005	0.0005	0.0410	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0032	0.0035	8.96	0.0006	0.0006	0.0029	0.00
Copper	mg/L	0.0005	0.0005	0.0417	0.04	4.16	0.0005	0.0005	0.0727	0.00
Iron	mg/L	0.01	0.01	0.98	0.94	4.17	0.01	0.01	1.4	0.00
Lead	mg/L	0.0003/0.00017*	0.0003	0.0034	0.0033	2.99	0.00017	0.0003	0.0041	**55.32**
Manganese	mg/L	0.0005	0.0005	0.2817	0.2711	3.84	0.0047	0.0005	1.0110	**161.54**
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.051	0.0476	6.90	0.0005	0.0005	0.0594	0.00

Parameter	Sample Date		6/18/2020				07/09/2020*			
	Unit	MDL	Trip Blank	Duplicate	Original	RPD (FD/N)	Field Blank	Lab Blank	Original	RPD (FB/LB)
Nickel	mg/L	0.0005	0.0005	0.0176	0.0158	10.78	0.0005	0.0005	0.0401	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0008	0.0002	**120.00**
Zinc	mg/L	0.001	0.001	0.005	0.006	18.18	0.001	0.001	0.008	0.00
Dissolved Metals										
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.00	0.006	0.006	0.006	0.00
Arsenic	mg/L	0.0005	0.0005	0.0112	0.008	*33.33*	0.0005	0.0005	0.0359	0.00
Barium	mg/L	0.0005	0.0005	0.0118	0.0119	0.84	0.0005	0.0005	0.0425	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.00	0.0006	0.0006	0.0006	0.00
Copper	mg/L	0.0005	0.0005	0.0158	0.0163	3.12	0.0005	0.0005	0.0055	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00
Lead	mg/L	0.0003/0.00017*	0.0003	0.0003	0.0003	0.00	0.00017	0.0003	0.00017	**55.32**
Manganese	mg/L	0.0005	0.0005	0.2191	0.2205	0.64	0.0036	0.0005	0.9095	**151.22**
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0399	0.0394	1.26	0.0005	0.0005	0.0556	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0008	0.0002	**120.00**
Zinc	mg/L	0.001	0.001	0.002	0.002	0.00	0.001	0.001	0.005	0.00
% Exceedance**						**2%**				**0%**

Footnotes:

*Different MDL after Sep 7 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-80 Meadowbank 2020 Vault RSF QAQC (ST-24)

Parameter	Sample Date		6/17/2020							05/08/2020*						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																
Hardness	mg CaCO3/L	1	1	1	1	45	42	6.90	0.00	1	1	1	216	223	3.19	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	2/5*	4	4	5	19	20	5.13	**22.22**	13	15	12	73	74	1.36	**22.22**
Total suspended solids	mg/L	1	1	1	1	5	5	0.00	0.00	1	1	1	2	1	**66.67**	0.00
Total dissolved solids	mg/L	2/1*	12	11	-	64	65	1.55	-	1	1	12	253	260	2.73	*169.23*
Major Ions																
Chloride	mg/L	0.5	0.5	0.5	0.5	0.7	0.7	0.00	0.00	0.5	0.5	0.5	2.2	2.8	**24.00**	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.02	0.04	0.04	0.00	0.00	0.02	0.02	0.02	0.12	0.12	0.00	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	17.9	18.1	1.11	0.00	0.7	0.6	0.6	112	111	0.90	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	-	0.001	0.001	0.00	-
Nutrients and Chlorophyll a																
Total ammonia as NH4	mg N/L	0.01	0.01	0.07	0.01	0.03	0.04	**28.57**	**150.00**	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.01	0.64	0.66	3.08	0.00	0.01	0.01	0.01	2.53	3.79	39.87	0.00
Nitrite	mg N/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total Metals																
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.218	0.310	34.85	0.00	0.006	0.006	0.006	0.006	0.008	**28.57**	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0021	0.0022	4.65	0.00	0.0005	0.0005	0.0005	0.0045	0.0050	10.53	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0048	0.0046	4.26	0.00	0.0005	0.0005	0.0005	0.0191	0.0224	15.90	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0031	0.0029	6.67	0.00	0.0005	0.0005	0.0005	0.0044	0.0041	7.06	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.36	0.35	2.82	0.00	0.01	0.01	0.01	0.03	0.03	0.00	0.00
Lead	mg/L	0.0003/0.00017*	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.0381	0.0375	1.59	0.00	0.0005	0.0005	0.0005	0.0296	0.0304	2.67	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0075	0.0064	15.83	0.00	0.0005	0.0005	0.0005	0.0278	0.0275	1.08	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0029	0.0031	6.67	0.00	0.0005	0.0005	0.0005	0.0056	0.0047	17.48	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
% Exceedance**								**4%**	**0%**						**4%**	**0%**

Footnotes:

*Different MDL after Aug 5 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-81 Meadowbank 2020 Vault Attenuation Pond QAQC (ST-25)

Parameter	Sample Date		7/8/2020						
	Uni	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters									
Hardness	mg CaCO3/L	1	1	1	-	66	73	10.07	-
Total alkalinity, as CaCO3	mg CaCO3/L	5	7	7	12	32	32	0.00	**52.63**
Total suspended solids	mg/L	1	1	1	1	2	1	**66.67**	0.00
Total dissolved solids	mg/L	1	1	1	12	96	96	0.00	*169.23*
Major Ions									
Chloride	mg/L	0.5	0.5	0.5	0.5	5.4	6.9	24.39	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.02	0.11	0.11	0.00	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	31.6	31.0	1.92	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.002	0.001	**66.67**	0.00
Nutrients and Chlorophyll a									
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	0.01	0.29	0.30	3.39	0.00
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.01	0.66	0.66	0.00	0.00
Nitrite	mg N/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total Metals									
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.083	0.058	*35.46*	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.0015	0.0012	**22.22**	-
Barium	mg/L	0.0005	0.0005	0.0005	-	0.0143	0.0136	5.02	-
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00002	0.00002	0.00	-
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0006	0.0006	0.00	-
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0057	0.0063	10.00	-
Iron	mg/L	0.01	0.01	0.01	-	0.23	0.24	4.26	-
Lead	mg/L	0.0003	0.0003	0.0003	-	0.0003	0.0003	0.00	-
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.0588	0.0669	12.89	-
Mercury	mg/L	0.00001	0.00001	0.00001	-	0.00001	0.00001	0.00	-
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0014	0.0016	13.33	-
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0052	0.0060	14.29	-
Selenium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Silver	mg/L	0.0001	0.0001	0.0001	-	0.0001	0.0001	0.00	-
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Zinc	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
% Exceedance*								**4%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-82 Meadowbank 2020 Vault Pit QAQC (ST-26)

Parameter	Sample Date		6/21/2020							18/08/2020*						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																
Hardness	mg CaCO3/L	1	1	1	1	53	53	0.00	0.00	1	1	1	142	140	1.42	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	5	6	6	12	31	34	9.23	**66.67**	14	15	12	59	56	5.22	**22.22**
TSS	mg/L	1	1	1	1	51	87	52.17	0.00	1	1	1	1	2	**66.67**	0.00
TDS	mg/L	1	-	2	12	84	101	18.38	*142.86*	2	1	12	187	187	0.00	*169.23*
Major Ions																
Chloride	mg/L	0.5	0.5	0.5	0.5	2.9	3.1	6.67	0.00	0.5	0.5	0.5	9.4	9.4	0.00	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.02	0.07	0.07	0.00	0.00	0.02	0.02	0.02	0.11	0.11	0.00	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	30.2	30.3	0.33	0.00	0.6	0.6	0.6	66.4	66.7	0.45	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Nutrients and Chlorophyll a																
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	0.01	0.15	0.21	33.33	0.00	0.01	0.01	0.01	0.11	0.11	0.00	0.00
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.01	1.15	0.84	31.16	0.00	0.01	0.01	0.01	2.51	2.63	4.67	0.00
Nitrite	mg N/L	0.01	0.01	0.01	0.01	0.03	0.03	0.00	0.00	0.01	0.01	0.01	0.02	0.01	**66.67**	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.1	0.1	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total Metals																
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.006	0.006	0.006	0.027	0.036	**28.57**	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0018	0.0055	*101.37*	0.00	0.0005	0.0005	0.0005	0.0044	0.0040	9.52	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	18.18	0.00	0.0005	0.0005	0.0005	0.0138	0.0138	0.00	0.00
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	-	0.01	0.01	0.00	-
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0043	**158.33**	0.00	0.0005	0.0005	0.0005	0.0009	0.0008	11.76	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.00	0.00

Parameter	Sample Date		6/21/2020							18/08/2020*						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Lead	mg/L	0.0003/ 0.00017*	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Lithium	mg/L	0.005	0.005	0.005	0.005	0.005	0.005	0.00	0.00	0.005	0.005	-	0.005	0.005	0.00	-
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.0164	0.0178	8.19	0.00	0.0005	0.0005	0.0005	0.0172	0.0194	12.02	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0098	0.0117	17.67	0.00	0.0005	0.0005	0.0005	0.0238	0.0220	7.86	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0018	**113.04**	0.00	0.0005	0.0005	0.0005	0.0013	0.0019	**37.50**	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	-	0.001	0.001	0.00	-
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Strontium	mg/L	0.005	0.005	0.005	0.005	0.103	0.104	0.97	0.00	0.005	0.005	-	0.217	0.224	3.17	-
Thallium	mg/L	0.0002	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Tin	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	-	0.001	0.001	0.00	-
Titanium	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	-	0.01	0.01	0.00	-
Uranium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	-	0.006	0.005	18.18	-
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	-	0.001	0.001	0.00	-
Dissolved Metals																
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.006	0.006	0.006	0.006	0.006	0.00	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0018	0.0055	*101.37*	0.00	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	18.18	0.00	0.0005	0.0005	0.0005	0.0123	0.0132	7.06	0.00
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0043	**158.33**	0.00	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Lead	mg/L	0.0003/ 0.00017*	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Lithium	mg/L	0.005	0.005	0.005	0.005	0.005	0.005	0.00	0.00	0.005	0.005	0.005	0.005	0.005	0.00	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.0164	0.0178	8.19	0.00	0.0005	0.0005	0.0005	0.0036	0.0034	5.71	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00

Parameter	Sample Date		6/21/2020							18/08/2020*						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0098	0.0117	17.67	0.00	0.0005	0.0005	0.0005	0.0154	0.0158	2.56	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0018	**113.04**	0.00	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Strontium	mg/L	0.005	0.005	0.005	0.005	0.103	0.104	0.97	0.00	0.005	0.005	0.005	0.233	0.241	3.38	0.00
Titanium	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.004	0.005	**22.22**	0.00
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
% Exceedance**								**5%**	**0%**						**0%**	**0%**

Footnotes:

*Different MDL after Aug 18 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-83 Meadowbank 2020 West Extension Pool WEP 1 QAQC (ST-30)

Parameter	Sample Date		2020-07-06						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters									
Hardness	mg CaCO3/L	1	1	1	1	89	87	2.27	0.00
Total alkalinity. as CaCO3	mg CaCO3/L	5	7	7	12	78	75	3.92	**52.63**
Total suspended solids	mg/L	1	1	1	1	2	3	**40.00**	0.00
Total dissolved solids	mg/L	1	1	1	12	135	121	10.94	*169.23*
Major Ions									
Chloride	mg/L	0.5	0.5	0.5	0.5	4.3	2.3	**60.61**	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.02	0.17	0.16	6.06	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	22.9	24	4.69	0.00
Cyanide	mg/L	0.001	0.001	0.001	-	0.013	0.013	0.00	-
Nutrients and Chlorophyll a									
Total ammonia as NH4	mg N/L	0.01	0.02	0.01	0.01	0.23	0.25	8.33	0.00
Un-Ionized Ammonia. calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.01	0.39	0.48	20.69	0.00
Nitrite	mg N/L	0.01	0.01	0.01	-	0.03	0.03	0.00	-
Total Metals									
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.012	**66.67**	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.004	0.004	0.00	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0106	0.0097	8.87	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0175	0.0165	5.88	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	1.2	1.1	8.70	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.1002	0.0903	10.39	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0019	0.0017	11.11	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0044	0.0043	2.30	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00
% Exceedance*								**4%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-84 Meadowbank 2020 West Extension Pool WEP 2 QAQC (ST-31)

Parameter	Sample Date		2020-08-04						08/09/2020*	
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Original
Conventional Parameters										
Hardness	mg CaCO3/L	1	1	1	141	150	6.19	0.00	1	126
Total alkalinity. as CaCO3	mg CaCO3/L	5	11	12	104	104	0.00	8.70	18	94
Total suspended solids	mg/L	1	1	1	2	2	0.00	0.00	1	3
Total dissolved solids	mg/L	1	1	12	186	182	2.17	*169.23*	1	204
Major Ions										
Chloride	mg/L	0.5	0.5	0.5	2.7	2.7	0.00	0.00	0.5	3.9
Fluoride	mg/L	0.02	0.02	0.02	0.2	0.19	5.13	0.00	0.02	0.15
Sulphate	mg/L	0.6	0.6	0.6	44.7	44.6	0.22	0.00	0.6	52.9
Cyanide (free)	mg/L	0.001	0.002	0.1	0.001	0.002	**66.67**	*192.16*	0.001	0.001
Cyanide (WAD)	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001
Cyanide	mg/L	0.001	0.001	-	0.001	0.002	**66.67**	-	0.001	0.001
Nutrients and Chlorophyll a										
Total ammonia as NH4	mg N/L	0.01	0.01	-	0.04	0.04	0.00	-	0.01	0.03
Un-Ionized Ammonia. calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01
Nitrate	mg N/L	0.01	0.01	0.01	0.63	0.63	0.00	0.00	0.01	2.75
Nitrite	mg N/L	0.01	0.01	0.01	0.01	0.02	**66.67**	0.00	0.01	0.01
Nitrate + nitrite	mg N/L	0.01	0.01	0.01	0.64	0.64	0.00	0.00	0.01	2.76
Total Metals										
Aluminum	mg/L	0.006	0.006	0.006	0.039	0.027	**36.36**	0.00	0.006	0.05
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0136	0.0129	5.28	0.00	0.0005	0.003
Barium	mg/L	0.0005	0.0101	0.0005	0.0159	0.0147	7.84	*181.13*	0.0005	0.0146
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00004	0.00002	**66.67**	0.00	0.00002	0.00002
Calcium	mg/L	0.03	0.03	0.03	33.3	35.8	7.24	0.00	0.03	27.8
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	0.0006
Copper	mg/L	0.0005	0.0005	0.0005	0.0087	0.0087	0.00	0.00	0.0005	0.0006
Iron	mg/L	0.01	0.06	0.01	0.56	0.58	3.51	**142.86**	0.03	0.18
Lead	mg/L	0.0003/ 0.00017*	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.00017	0.00017
Magnesium	mg/L	0.02	0.04	0.02	14.1	14.81	4.91	**66.67**	0.07	13.73
Manganese	mg/L	0.0005	0.0005	0.0005	0.1089	0.1191	8.95	0.00	0.0005	0.0573
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0053	0.005	5.83	0.00	0.0005	0.0017
Nickel	mg/L	0.0005	0.0005	0.0005	0.0046	0.0042	9.09	0.00	0.0005	0.0025
Selenium	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001
Silver	mg/L	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001
Thallium	mg/L	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002
Zinc	mg/L	0.001	0.001	-	0.002	0.001	**66.67**	-	0.125	0.001
% Exceedance**							**0%**	**0%**		

Footnotes:

*Different MDL after Sep 8 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-85 Meadowbank 2020 Saddle Dam 3 QAQC (ST-32)

Parameter	Sample Date		2020-08-05					
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters								
Hardness	mg CaCO3/L	1	1	1	303	256	16.82	0.00
Total alkalinity. as CaCO3	mg CaCO3/L	5	32	12	88	88	0.00	**90.91**
Total suspended solids	mg/L	1	1	1	2	5	**85.71**	0.00
Total Dissolved Solids	mg/L	1	1	12	401	398	0.75	*169.23*
Major Ions								
Chloride	mg/L	0.5	0.5	0.5	19.3	19	1.57	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.36	0.36	0.00	0.00
Sulphate	mg/L	0.6	0.6	0.6	159	162	1.87	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Nutrients and Chlorophyll a								
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	0.03	0.03	0.00	0.00
Un-Ionized Ammonia. calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	11.3	14.8	26.82	0.00
Nitrite	mg N/L	0.01	0.05	0.01	0.09	0.1	10.53	**133.33**
Total Metals								
Aluminum	mg/L	0.006	0.006	0.006	0.042	0.032	**27.03**	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0648	0.054	18.18	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0401	0.0311	25.28	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0025	0.0024	4.08	0.00
Iron	mg/L	0.01	0.01	0.01	0.07	0.06	15.38	0.00
Lead	mg/L	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Manganese	mg/L	0.0005	0.0005	0.0005	0.1006	0.0889	12.35	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0086	0.0065	27.81	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0387	0.0358	7.79	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.00
% Exceedance*							**11%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-86 Meadowbank 2020 Phaser Pit QAQC (ST-41/ST-41 Lake)

Parameter	Sample date		2020-06-29							2020-07-07					
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters															
Hardness	mg CaCO3/L	1	1	1	1	65	66	1.53	0.00	1	-	74	73	1.36	-
Total alkalinity. as CaCO3	mg CaCO3/L	5	6	6	12	27	29	7.14	**66.67**	7	12	30	30	0.00	**52.63**
Total suspended solids	mg/L	1	1	1	1	5	6	18.18	0.00	1	1	4	4	0.00	0.00
Total Dissolved Solids	mg/L	1	2	2	12	82	89	8.19	*142.86*	1	12	88	89	1.13	*169.23*
Major Ions															
Chloride	mg/L	0.5	0.5	0.5	0.5	1.1	1.1	0.00	0.00	0.5	0.5	1.3	3.3	**86.96**	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.02	0.06	0.04	**40.00**	0.00	0.02	0.02	0.07	0.07	0.00	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	31.2	32	2.53	0.00	0.6	0.6	31.4	30.5	2.91	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.0014	0.001	0.001	0.00	*33.33*	0.001	0.001	0.003	0.001	**100.00**	0.00
Nutrients and Chlorophyll a															
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	-	0.15	0.14	6.90	-	0.01	0.01	0.07	0.07	0.00	0.00
Un-Ionized Ammonia. calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.01	1.21	1.38	13.13	0.00	0.01	0.01	1.5	1.43	4.78	0.00
Nitrite	mg N/L	0.01	0.01	0.01	0.01	0.02	0.02	0.00	0.00	0.01	0.01	0.02	0.02	0.00	0.00
Total Metals															
Aluminum	mg/L	0.006	0.006	0.006	-	0.169	0.188	10.64	-	0.016	0.006	0.132	0.11	18.18	**90.91**
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.0013	0.0021	**47.06**	-	0.0024	0.0005	0.0015	0.0015	0.00	**131.03**
Barium	mg/L	0.0005	0.0005	0.0005	-	0.0088	0.0082	7.06	-	0.0036	0.0005	0.0127	0.0111	13.45	**151.22**
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.0009	0.00002	0.00002	0.00002	0.00	*191.30*
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0019	0.0006	0.0006	0.0006	0.00	**104.00**
Copper	mg/L	0.0005	0.0005	0.0005	0.001	0.0026	0.003	14.29	**66.67**	0.0031	0.0005	0.0041	0.0032	**24.66**	**144.44**
Iron	mg/L	0.01	0.01	0.01	-	0.29	0.34	15.87	-	0.07	0.01	0.26	0.21	21.28	**150.00**
Lead	mg/L	0.0003	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.0803	0.0904	11.83	-	0.0051	0.0005	0.0791	0.0698	12.49	*164.29*
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0048	0.0046	4.26	-	0.0006	0.0005	0.0055	0.0041	*29.17*	18.18
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0065	0.0079	19.44	-	0.0025	0.0005	0.0077	0.0072	6.71	**133.33**
Selenium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	-	0.001	0.001	0.00	-
Silver	mg/L	0.0001	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	-	0.0002	0.0002	0.00	-
Zinc	mg/L	0.001	0.001	0.001	-	0.001	0.047	*191.67*	-	0.001	-	0.001	0.001	0.00	-
Dissolved Metals															
Aluminum	mg/L	0.006	0.006	0.006	-	0.006	0.006	0.00	-	0.006	0.006	0.006	0.013	**73.68**	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.0009	0.001	10.53	-	0.0005	-	0.0012	0.0007	**52.63**	-
Barium	mg/L	0.0005	0.0005	0.0005	-	0.0051	0.0049	4.00	-	0.0005	-	0.0048	0.0083	**53.44**	-
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	-	0.00002	0.00002	0.00	-
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0006	-	0.0006	0.0006	0.00	-
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0007	0.0009	**25.00**	0.00	0.0005	-	0.0012	0.0012	0.00	-
Iron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.01	-	0.02	0.02	0.00	-
Lead	mg/L	0.0003	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	-	0.0003	0.0003	0.00	-
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.0701	0.0655	6.78	-	0.0005	-	0.0497	0.0489	1.62	-
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00

Parameter	Sample date		2020-06-29							2020-07-07					
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0036	0.0036	0.00	-	0.0005	-	0.0031	0.0033	6.25	-
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0044	0.0046	4.44	-	0.0005	-	0.005	0.006	18.18	-
Selenium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	-	0.001	0.001	0.00	-
Silver	mg/L	0.0001	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.0001	-	0.0001	0.0001	0.00	-
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	-	0.0002	0.0002	0.00	-
Zinc	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	-	0.001	0.001	0.00	-
% Exceedance*								**0%**	**0%**					**2%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-87 Meadowbank 2020 BB Phaser Pit QAQC (ST-42/ST-42 Lake)

Parameter	Sample Date		2020-08-18					
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters								
Hardness	mg CaCO3/L	1	1	1	70	70	0.00	0.00
Total alkalinity. as CaCO3	mg CaCO3/L	5	25	12	46	42	9.09	**70.27**
Total suspended solids	mg/L	1	1	1	3	3	0.00	0.00
Total dissolved solids	mg/L	1	1	-	84	84	0.00	-
Major Ions								
Chloride	mg/L	0.5	0.5	0.5	2.2	1.5	**37.84**	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.08	0.07	13.33	0.00
Sulphate	mg/L	0.6	0.6	0.6	26.7	26.3	1.51	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Nutrients and Chlorophyll a								
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	0.03	0.04	**28.57**	0.00
Un-Ionized Ammonia. calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.76	0.78	2.60	0.00
Nitrite	mg N/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total Metals								
Aluminum	mg/L	0.006	0.006	0.006	0.103	0.078	27.62	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0023	0.0018	**24.39**	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0096	0.0083	14.53	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0036	0.0041	12.99	0.00
Iron	mg/L	0.01	0.01	0.01	0.12	0.11	8.70	0.00
Lead	mg/L	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Manganese	mg/L	0.0005	0.0005	0.0005	0.011	0.013	16.67	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0039	0.004	2.53	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0047	0.0045	4.35	0.00
Selenium	mg/L	0.001	0.001	-	0.001	0.001	0.00	-
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Zinc	mg/L	0.001	0.001	-	0.001	0.002	**66.67**	-
Dissolved Metals								
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0058	0.0057	1.74	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00

Parameter	Sample Date		2020-08-18					
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Lead	mg/L	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.00
% Exceedance*							**2%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-88 Meadowbank 2020 Phaser Attenuation Pond QAQC (ST-43)

Parameter	Sample Date		2020-07-07						2020-09-09	
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Original
Conventional Parameters										
Hardness	mg CaCO3/L	1	1	-	49	48	2.06	-	1	93
Total alkalinity. as CaCO3	mg CaCO3/L	5	7	12	16	16	0.00	**52.63**	17	49
Total suspended solids	mg/L	1	1	1	2	2	0.00	0.00	1	11
Total dissolved solids	mg/L	1	6	12	78	65	18.18	*66.67*	1	120
Major Ions										
Chloride	mg/L	0.5	2.3	0.5	1	1	0.00	**128.57**	5	2.2
Fluoride	mg/L	0.02	0.02	0.02	0.05	0.05	0.00	0.00	0.02	0.09
Sulphate	mg/L	0.6	0.6	0.6	29	28.9	0.35	0.00	0.6	60.9
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001
Nutrients and Chlorophyll a										
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	0.07	0.07	0.00	0.00	0.05	0.05
Un-Ionized Ammonia. calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01
Nitrate	mg N/L	0.01	0.01	0.01	0.8	0.77	3.82	0.00	1.17	0.97
Nitrite	mg N/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01
Total Metals										
Aluminum	mg/L	0.006	0.006	0.006	0.067	0.074	9.93	0.00	0.006	0.036
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005
Barium	mg/L	0.0005	0.0005	0.0005	0.0082	0.008	2.47	0.00	0.0005	0.0143
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	0.0006
Copper	mg/L	0.0005	0.0005	0.0005	0.0039	0.004	2.53	0.00	0.0005	0.0051
Iron	mg/L	0.01	0.01	0.01	0.38	0.37	2.67	0.00	0.01	0.23
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.00017	0.00017
Manganese	mg/L	0.0005	0.0005	0.0005	0.0892	0.0882	1.13	0.00	0.0005	0.0128
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0007
Nickel	mg/L	0.0005	0.0005	0.0005	0.0119	0.0119	0.00	0.00	0.0005	0.0084
Selenium	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001
Thallium	mg/L	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002
Zinc	mg/L	0.001	0.001	-	0.004	0.005	**22.22**	-	0.001	0.001
Dissolved Metals										
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.006	0.006
Arsenic	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005
Barium	mg/L	0.0005	0.0005	-	0.0047	0.0051	8.16	-	0.0005	0.0117
Cadmium	mg/L	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00002
Chromium	mg/L	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0006	0.0006
Copper	mg/L	0.0005	0.0005	-	0.002	0.002	0.00	-	0.0005	0.0033
Iron	mg/L	0.01	0.01	-	0.11	0.11	0.00	-	0.01	0.04
Lead	mg/L	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.00017	0.00017

Parameter	Sample Date		2020-07-07						2020-09-09	
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Original
Manganese	mg/L	0.0005	0.0005	-	0.0707	0.0716	1.26	-	0.0005	0.003
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001
Molybdenum	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005
Nickel	mg/L	0.0005	0.0005	-	0.0095	0.0104	9.05	-	0.0005	0.0067
Selenium	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001
Silver	mg/L	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001
Thallium	mg/L	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002
Zinc	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001
% Exceedance*							**0%**	**0%**		

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-89 Meadowbank 2020 East Dike Seepage QAQC (ST-S-1)

Parameter	Sample date		7/7/2020							10/05/2020*						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																
Hardness	mg CaCO3/L	1	1	1	-	56	59	5.22	-	1	1	1	39	43	9.76	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	5	7	7	12	32	32	0.00	**52.63**	19	19	-	43	43	0.00	-
TSS	mg/L	1	1	1	1	3	3	0.00	0.00	1	2	1	1	1	0.00	**66.67**
Total Dissolved Solids	mg/L	1	1	1	12	80	83	3.68	*169.23*	1	1	-	49	52	5.94	-
Major Ions																
Chloride	mg/L	0.5	0.5	0.5	0.5	1.3	8.1	*144.68*	0.00	0.5	0.5	0.5	1.0	1.0	0.00	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.02	0.09	0.09	0.00	0.00	0.02	0.02	0.02	0.11	0.11	0.00	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	27.0	27.4	1.47	0.00	0.6	1.1	0.6	10.6	8.7	19.69	**58.82**
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.002	0.006	**100.00**	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Nutrients and Chlorophyll a																
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	0.01	0.02	0.01	**66.67**	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.12	0.01	0.01	0.00	*169.23*
Nitrate	mg N/L	0.01	0.01	0.01	0.01	0.47	0.48	2.11	0.00	0.01	0.01	0.01	0.13	0.14	7.41	0.00
Nitrite	mg N/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total Metals																
Aluminum	mg/L	0.006/ 0.005*	0.006	0.013	0.006	0.032	0.018	**56.00**	**73.68**	0.005	0.005	0.006	0.021	0.019	10.00	18.18
Arsenic	mg/L	0.0005	0.0005	0.0020	-	0.0052	0.0059	12.61	-	0.0005	0.0005	0.0005	0.0006	0.0019	**104.00**	0.00
Barium	mg/L	0.0005	0.0005	0.0022	-	0.0093	0.0084	10.17	-	0.0005	0.0005	0.0005	0.0065	0.0080	20.69	0.00
Cadmium	mg/L	0.00002	0.00002	0.00064	-	0.00002	0.00002	0.00	-	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0014	-	0.0006	0.0006	0.00	-	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0024	-	0.0005	0.0006	18.18	-	0.0005	0.0005	0.0005	0.0009	0.0006	**40.00**	0.00
Iron	mg/L	0.01	0.01	0.05	-	0.09	0.08	11.76	-	0.01	0.01	0.01	0.01	0.02	**66.67**	0.00
Lead	mg/L	0.0003/ 0.00017*	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Manganese	mg/L	0.0005	0.0005	0.0032	-	0.0418	0.0444	6.03	-	0.0005	0.0005	0.0005	0.0006	0.0148	*184.42*	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	0.0005	0.0005	0.0020	**120.00**	0.00
Nickel	mg/L	0.0005	0.0005	0.0014	-	0.0114	0.0127	10.79	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Selenium	mg/L	0.001/ 0.0005*	0.001	0.001	-	0.001	0.001	0.00	-	0.0005	0.0005	0.001	0.0005	0.0005	0.00	**66.67**
Silver	mg/L	0.0001	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001	0.609	0.027	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00
% Exceedance**								**0%**	**0%**						**3.57%**	

Footnotes:
*Different MDL after Nov 15 2020.
RPD = Relative Percent Difference; MDL: Mean Detection Limit
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-90 Meadowbank 2020 Saddle Dam 1 QAQC (ST-S-2)

Parameter	Sample Date		2020-08-04					
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters								
Hardness	mg CaCO3/L	1	1	1	379	405	6.63	0.00
Total alkalinity. as CaCO3	mg CaCO3/L	5	13	12	63	63	0.00	8.00
Total suspended solids	mg/L	1	1	1	3	4	**28.57**	0.00
Total dissolved solids	mg/L	1	2	12	461	460	0.22	*142.86*
Major Ions								
Chloride	mg/L	0.5	0.5	0.5	6.9	7.4	6.99	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.26	0.26	0.00	0.00
Sulphate	mg/L	0.6	0.6	0.6	276	279	1.08	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.002	0.001	**66.67**	0.00
Nutrients and Chlorophyll a								
Total ammonia as NH4	mg N/L	0.01	0.01	-	0.01	0.01	0.00	-
Un-Ionized Ammonia. calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	6.56	6.76	3.00	0.00
Nitrite	mg N/L	0.01	0.01	0.01	0.02	0.04	**66.67**	0.00
Total Metals								
Aluminum	mg/L	0.006	0.006	0.006	0.035	0.023	**41.38**	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0584	0.0621	6.14	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0271	0.0266	1.86	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0018	0.0021	15.38	0.00
Iron	mg/L	0.01	0.01	0.01	0.07	0.09	**25.00**	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.031	0.0348	11.55	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.015	0.0146	2.70	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0234	0.0251	7.01	0.00
Selenium	mg/L	0.001	0.001	-	0.001	0.002	**66.67**	-
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Zinc	mg/L	0.001	0.001	-	0.001	0.001	0.00	-
% Exceedance*							**0%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-91 Meadowbank 2020 Central Dike Seepage QAQC (ST-S-5)

Parameter	Sample Date		2020-02-04							** 2020-07-13						**2020-08-10						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																						
Hardness	mg CaCO3/L	1/0.5**	1	1	-	946	973	2.81	-	1	1	1320	1368	3.57	0.00	1	1	-	958	972	1.45	-
Total alkalinity. as CaCO3	mg CaCO3/L	5/1**	31	33	12	127	122	4.02	**93.33**	7	12	114	113	0.88	**52.63**	12	12	12	102	102	0.00	0.00
Total suspended solids	mg/L	1	1	1	1	7	7	0.00	0.00	1	1	8	7	13.33	0.00	1	1	1	7	7	0.00	0.00
Total dissolved solids	mg/L	1/10**	1	5	-	2304	2308	0.17	-	5	12	2320	2322	0.09	*82.35*	1	1	12	1982	1985	0.15	*169.23*
Dissolved organic carbon	mg/L	0.2/0.4**	0.2	0.4	-	30	30	0.00	-	1.8	0.2	0.2	1.5	**152.94**	**160.00**	0.7	1.4	0.2	10.8	8.6	22.68	**150.00**
Major Ions																						
Chloride	mg/L	0.5 / 0 **	0.5	0.5	0.5	367.5	347.5	5.59	0.00	0.5	0.5	291.7	349	17.89	0.00	0.5	0.5	0.5	232.2	232.1	0.04	0.00
Fluoride	mg/L	0.02 / 0.1 **	0.02	0.02	0.02	0.55	0.55	0.00	0.00	0.02	0.02	0.49	0.48	2.06	0.00	0.02	0.02	0.02	0.46	0.46	0.00	0.00
Sulphate	mg/L	0.6 / 0 / 5**	0.6	0.6	0.6	1720	1710	0.58	0.00	0.6	0.6	1570	1580	0.63	0.00	0.9	0.6	0.6	2490	2490	0.00	0.00
Cyanide	mg/L	0.001 / 0.005 **	0.001	0.001	0.001	0.048	0.055	13.59	0.00	0.001	0.001	0.071	0.067	5.80	0.00	0.002	0.004	0.006	0.047	0.045	4.35	**40.00**
Nutrients and Chlorophyll a																						
Total ammonia as NH4	mg N/L	0.01 / 0.05 **	0.01	0.02	0.01	25.68	25.47	0.82	**66.67**	0.05	0.05	21	21	0.00	0.00	0.01	0.02	0.01	29.8	28.29	5.20	**66.67**
Un-Ionized Ammonia. calculated	mg NH3/L	0.01	0.01	0.01	-	0.23	0.26	12.24	-	0.01	0.01	0.23	0.21	9.09	0.00	0.01	0.01	0.01	0.54	0.53	1.87	0.00
Nitrate	mg N/L	0.01	0.01	0.02	0.01	0.01	0.01	0.00	**66.67**	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.28	0.28	0.00	0.00
Nitrite	mg N/L	0.01	0.01	0.01	-	0.14	0.2	35.29	-	0.02	0.01	0.03	0.03	0.00	**66.67**	0.01	0.01	0.01	0.03	0.03	0.00	0.00
Total Metals																						
Aluminum	mg/L	0.006 / 0.005 **	0.006	0.006	-	0.006	0.006	0.00	-	0.006	0.006	0.006	0.006	0.00	0.00	0.006	0.006	0.006	0.006	0.028	**129.41**	0.00
Arsenic	mg/L	0.0005 / 0.0002 **	0.0005	0.0011	-	0.0426	0.0447	4.81	-	0.0005	0.0005	0.1105	0.1182	6.73	0.00	0.0005	0.0005	-	0.0565	0.057	0.88	-
Barium	mg/L	0.0005 / 0.002 **	0.0005	0.0005	0.0005	0.0246	0.026	5.53	0.00	0.0005	0.0005	0.0258	0.0291	12.02	0.00	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.0003	0.00025	18.18	-	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	-	0.00002	0.00002	0.00	-
Chromium	mg/L	0.0006 / 0.002 **	0.0006	0.0006	-	0.0006	0.0017	**95.65**	-	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	0.0006	-	0.0006	0.0006	0.00	-
Copper	mg/L	0.0005 / 0.001 **	0.0005	0.0005	-	0.0046	0.005	8.33	-	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Iron	mg/L	0.01 / 0.02 **	0.01	0.01	-	1.3	1.3	0.00	-	0.01	0.01	3.8	3.9	2.60	0.00	0.01	0.01	-	1.3	1.4	7.41	-
Lead	mg/L	0.0003 / 0.00017/ 0.0004 **	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.00017	0.00017	-	0.00017	0.00017	0.00	-
Manganese	mg/L	0.0005 / 0.002 **	0.0005	0.0005	-	2.1964	2.3372	6.21	-	0.0005	0.0005	2.5951	2.6259	1.18	0.00	0.0005	0.0046	-	1.8541	1.9961	7.38	-
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005 / 0.002 **	0.0005	0.0005	-	0.2407	0.2536	5.22	-	0.0005	0.0005	0.24	0.2565	6.65	0.00	0.0005	0.0005	-	0.1609	0.163	1.30	-
Nickel	mg/L	0.0005 / 0.002 **	0.0005	0.0005	-	0.0129	0.013	0.77	-	0.0005	0.0005	0.0074	0.0077	3.97	0.00	0.0005	0.0005	-	0.0155	0.0169	8.64	-
Selenium	mg/L	0.001 / 0.005 **	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	-	0.001	0.001	0.00	-
Silver	mg/L	0.0001 / 0.00004 **	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	-	0.0001	0.0001	0.00	-
Thallium	mg/L	0.0002 / 0.00002 **	0.0002	0.0002	-	0.0005	0.0019	**116.67**	-	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Zinc	mg/L	0.001 / 0.01 **	0.002	0.001	-	0.003	0.003	0.00	-	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Dissolved Metals																						
Aluminum	mg/L	0.006 / 0.005 **	0.006	0.006	-	0.006	0.006	0.00	-	0.006	0.006	0.006	0.006	0.00	0.00	0.006	0.006	0.006	0.006	0.006	0.00	0.00
Arsenic	mg/L	0.0005 / 0.0002 **	0.0005	0.001	-	0.0077	0.0071	8.11	-	0.0005	-	0.0459	0.0577	22.78	-	0.0005	0.0005	-	0.0092	0.0096	4.26	-
Barium	mg/L	0.0005 / 0.002 **	0.0005	0.0005	0.0005	0.0246	0.0258	4.76	0.00	0.0005	-	0.0254	0.0201	**23.30**	-	0.0005	0.0005	0.0005	0.0025	0.0017	**38.10**	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00037	0.00034	8.45	-	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00002	-	0.00002	0.00002	0.00	-
Chromium	mg/L	0.0006 / 0.002 **	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0006	-	0.0006	0.0006	0.00	-	0.0006	0.0006	-	0.0006	0.0006	0.00	-
Copper	mg/L	0.0005 / 0.0004 **	0.0005	0.0005	-	0.0046	0.0048	4.26	-	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Iron	mg/L	0.01	0.01	0.01	-	0.06	0.04	**40.00**	-	0.01	-	0.02	0.01	**66.67**	-	0.01	0.01	-	0.01	0.01	0.00	-
Lead	mg/L	0.0003 / 0.00017 / 0.0004 **	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	-	0.0003	0.0003	0.00	-	0.00017	0.00017	-	0.00017	0.00017	0.00	-
Manganese	mg/L	0.0005 / 0.002 **	0.0005	0.0005	-	2.1924	2.3439	6.68	-	0.0031	-	2.2818	2.1052	8.05	-	0.0005	0.0025	-	1.4048	1.3228	6.01	-
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005 / 0.002 **	0.0005	0.0005	-	0.2402	0.2527	5.07	-	0.0006	-	0.2134	0.1931	9.99	-	0.0005	0.0005	-	0.1272	0.1246	2.07	-
Nickel	mg/L	0.0005 / 0.002 **	0.0005	0.0005	-	0.0151	0.0146	3.37	-	0.0005	-	0.0066	0.0063	4.65	-	0.0005	0.0005	-	0.0125	0.0116	7.47	-
Selenium	mg/L	0.001 / 0.0005 / 0.0002 **	0.001	0.001	-	0.001	0.001	0.00	-	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-
Silver	mg/L	0.0001 / 0.00004 **	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001	-	0.0001	0.0001	0.00	-
Thallium	mg/L	0.0002 / 0.00002 **	0.0002	0.0002	-	0.0008	0.0028	*111.11*	-	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001 / 0.01 **	0.001	0.001	-	0.004	0.005	**22.22**	-	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00
***Exceedances**								**2%**	**0%**					**2%**	**0%**						**2%**	**0%**

Parameter	Sample Date		**2020-11-04							**2020-12-07			**2020-12-14			
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Duplicate	Original	RPD (FD/N)	Field Blank	Lab Blank	Original	RPD (FB/LB)
Conventional Parameters																
Hardness	mg CaCO3/L	1/0.5**	1	1	-	919	1024	10.81	-	900	899	0.11	1	1	969	0.00
Total alkalinity. as CaCO3	mg CaCO3/L	5/1**	20	20	-	138	139	0.72	-	130	130	0.00	23	-	149	-
Total suspended solids	mg/L	1	1	2	1	10	7	*35.29*	**66.67**	3	4	28.57	1	1	4	0.00
Total dissolved solids	mg/L	1/10**	2	6	-	2107	2050	2.74	-	2580	2540	1.56	2	-	2105	-
Dissolved organic carbon	mg/L	0.2/0.4**	2.4	2.7	0.8	7.7	9.8	24.00	*108.57*	23	24	4.26	1.3	0.5	29.5	**88.89**
Major Ions																
Chloride	mg/L	0.5 / 0 **	0	0	-	190	180	5.41	-	220	220	0.00	0.5	0.5	276.9	0.00
Fluoride	mg/L	0.02 / 0.1 **	0.02	0.02	0.02	0.52	0.52	0.00	0.00	0.5	0.51	1.98	0.02	0.02	0.56	0.00
Sulphate	mg/L	0.6 / 0 / 5**	0	0	-	1700	1700	0.00	-	1400	1400	0.00	0.6	0.6	1450	0.00
Cyanide	mg/L	0.001 / 0.005 **	0.001	0.001	0.001	0.058	0.059	1.71	0.00	0.052	0.054	3.77	0.001	0.001	0.069	0.00
Nutrients and Chlorophyll a																
Total ammonia as NH4	mg N/L	0.01 / 0.05 **	0.04	0.06	0.05	29	29	0.00	18.18	31	29	6.67	0.01	0.01	28.5	0.00
Un-Ionized Ammonia. calculated	mg NH3/L	0.01	0.01	0.01	-	0.21	0.2	4.88	-	-	-	-	0.01	0.01	0.24	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.01	0.14	0.11	24.00	0.00	0.21	0.21	0.00	0.02	0.01	0.14	**66.67**
Nitrite	mg N/L	0.01	0.01	0.01	0.01	0.03	0.03	0.00	0.00	0.043	0.043	0.00	0.01	0.01	0.02	0.00
Total Metals																
Aluminum	mg/L	0.006 / 0.005 **	0.005	0.005	-	0.006	0.006	0.00	-	0.006	0.0093	**43.14**	0.005	0.006	0.005	18.18
Arsenic	mg/L	0.0005 / 0.0002 **	0.0005	0.0005	-	0.0549	0.062	12.15	-	0.048	0.0477	0.63	0.0005	0.0005	0.0388	0.00
Barium	mg/L	0.0005 / 0.002 **	0.0005	0.0005	-	0.0211	0.0234	10.34	-	0.0223	0.0219	1.81	0.0005	0.0005	0.0198	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006 / 0.002 **	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.002	0.002	0.00	0.0006	0.0006	0.0006	0.00
Copper	mg/L	0.0005 / 0.001 **	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.001	0.001	0.00	0.0005	0.0005	0.0005	0.00
Iron	mg/L	0.01 / 0.02 **	0.01	0.01	-	1.1	1.3	16.67	-	1.44	1.45	0.69	0.01	0.01	1.1	0.00
Lead	mg/L	0.0003 / 0.00017/ 0.0004 **	0.00017	0.00017	-	0.00017	0.00017	0.00	-	0.0004	0.0004	0.00	0.00017	0.0003	0.00017	**55.32**
Manganese	mg/L	0.0005 / 0.002 **	0.0005	0.0005	-	2.2699	2.1134	7.14	-	1.81	1.8	0.55	0.0008	0.0005	1.8911	**46.15**
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005 / 0.002 **	0.0005	0.0005	-	0.1575	0.1776	12.00	-	0.179	0.173	3.41	0.0005	0.0005	0.1635	0.00
Nickel	mg/L	0.0005 / 0.002 **	0.0005	0.0005	-	0.0049	0.0068	*32.48*	-	0.0063	0.0063	0.00	0.0005	0.0005	0.007	0.00
Selenium	mg/L	0.001 / 0.005 **	0.0005	0.0005	-	0.0005	0.0005	0.00	-	-	-	-	0.0005	0.001	0.0005	**66.67**
Silver	mg/L	0.0001 / 0.00004 **	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.00004	0.00004	0.00	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002 / 0.00002 **	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.00002	0.00002	0.00	0.0002	0.0008	0.0002	**120.00**
Zinc	mg/L	0.001 / 0.01 **	0.009	0.001	0.001	0.001	0.001	0.00	0.00	0.01	0.01	0.00	0.001	0.001	0.001	0.00
Dissolved Metals																
Aluminum	mg/L	0.006 / 0.005 **	0.005	0.005	-	0.005	0.005	0.00	-	0.006	0.006	0.00	0.005	0.006	0.005	18.18
Arsenic	mg/L	0.0005 / 0.0002 **	0.0005	0.0005	-	0.0103	0.0101	1.96	-	0.0208	0.0208	0.00	0.0005	0.0005	0.008	0.00
Barium	mg/L	0.0005 / 0.002 **	0.0005	0.0005	-	0.0227	0.0244	7.22	-	0.0213	0.0214	0.47	0.0005	0.0005	0.0205	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006 / 0.002 **	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.002	0.002	0.00	0.0006	0.0006	0.0006	0.00
Copper	mg/L	0.0005 / 0.0004 **	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0004	0.0004	0.00	0.0005	0.0005	0.0005	0.00
Iron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.748	0.739	1.21	0.01	0.01	0.02	0.00
Lead	mg/L	0.0003 / 0.00017 / 0.0004 **	0.00017	0.00017	-	0.00017	0.00017	0.00	-	0.0004	0.0004	0.00	0.00017	0.0003	0.00017	**55.32**
Manganese	mg/L	0.0005 / 0.002 **	0.0005	0.0005	-	2.2637	2.0897	7.99	-	1.69	1.68	0.59	0.0005	0.0005	2.0049	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00004	**120.00**	0.00	0.00001	0.00001	0.00	0.00003	0.00001	0.00003	**100.00**
Molybdenum	mg/L	0.0005 / 0.002 **	0.0005	0.0005	-	0.179	0.1683	6.16	-	0.168	0.168	0.00	0.0005	0.0005	0.167	0.00
Nickel	mg/L	0.0005 / 0.002 **	0.0005	0.0005	-	0.0063	0.0059	6.56	-	0.0061	0.006	1.65	0.0005	0.0005	0.0072	0.00
Selenium	mg/L	0.001 / 0.0005 / 0.0002 **	0.0005	0.0005	-	0.0005	0.0007	**33.33**	-	0.00086	0.00073	16.35	0.0005	0.001	0.0018	**66.67**
Silver	mg/L	0.0001 / 0.00004 **	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.00004	0.00004	0.00	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002 / 0.00002 **	0.0002	0.0002	-	0.0002	0.001	**133.33**	-	0.00002	0.00002	0.00	0.0002	0.0008	0.0002	**120.00**
Zinc	mg/L	0.001 / 0.01 **	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.01	0.01	0.00	0.001	0.001	0.001	0.00
***Exceedances**								**4%**	**0%**			**0%**				**0%**

Footnotes:

**Different MDL.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-92 Meadowbank 2020 Sewage Treatment Plan QAQC (STP)

STP-SEP	Sample Date		2020-01-06				04/11/2020*						
	Unit	MDL	Trip Blank	Duplicate	Original	RPD (FD/N)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Biochemical oxygen demand	mg/L	1	1	8	7	13.33	1	1	1	6	6	0.00	0.00
Chemical oxygen demand	mg/L	7	7	68	64	6.06	7	7	7	44	56	**24.00**	0.00
Total ammonia as NH4	mg N/L	0.01	0.01	38.39	38.23	0.42	0.02	0.03	0.05	32	33	3.08	**50.00**
Un-Ionized Ammonia. calculated	mg NH3/L	0.01	0.01	0.5	0.52	3.92	0.01	0.01	-	0.34	0.34	0.00	-
Nitrate	mg N/L	0.01	0.01	5.39	5.01	7.31	0.01	0.01	0.01	4.05	4.4	8.28	0.00
Nitrite	mg N/L	0.01	0.01	1.13	1.15	1.75	0.01	0.01	0.01	1.22	1.03	16.89	0.00
Total nitrogen	mg N/L	0.05/0.7*	0.12	42	43	2.35	0.7	0.7	0.3	33	34	2.99	**80.00**
% Exceedance**						**0%**						**0%**	**0%**

STP-LP-MIX	Sample Date		2020-08-03				04/11/2020*						
	Unit	MDL	Trip Blank	Duplicate	Original	RPD (FD/N)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Biochemical oxygen demand	mg/L	1	1	2	3	**40.00**	1	3	1	7	6	15.38	**100.00**
Chemical oxygen demand	mg/L	7	7	38	32	17.14	7	7	7	43	34	23.38	0.00
Total ammonia as NH4	mg N/L	0.01	0.01	4.29	2.62	48.34	0.03	0.03	0.05	11	12	8.70	**50.00**
Un-Ionized Ammonia. calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	-	0.01	0.01	0.00	-
Nitrate	mg N/L	0.01	0.01	24	21.5	10.99	0.01	0.01	0.01	22.7	25.7	12.40	0.00
Nitrite	mg N/L	0.01	0.01	0.05	0.05	0.00	0.01	0.01	0.01	0.11	0.1	9.52	0.00
Total nitrogen	mg N/L	0.05/0.7*	0.05	5.8	3.8	41.67	0.7	0.7	0.3	13	13	0.00	**80.00**
% Exceedance**						**29%**						**14%**	**0%**

STP-IN	Sample Date		2020-08-03				04/11/2020*						
	Unit	MDL	Trip Blank	Duplicate	Original	RPD (FD/N)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Biochemical oxygen demand	mg/L	1	1	171	155	9.82	1	1	1	221	195	12.50	0.00
Chemical oxygen demand	mg/L	7	7	448	467	4.15	7	7	7	483	652	29.78	0.00
Total ammonia as NH4	mg N/L	0.01	0.01	71.82	70.99	1.16	0.06	0.05	0.05	92	94	2.15	0.00
Un-Ionized Ammonia. calculated	mg NH3/L	0.01	0.01	0.76	0.75	1.32	0.01	0.01	-	1.5	1.5	0.00	-
Nitrate	mg N/L	0.01	0.01	0.26	0.27	3.77	0.01	0.01	0.01	0.35	0.43	20.51	0.00
Nitrite	mg N/L	0.01	0.01	0.02	0.02	0.00	0.01	0.01	0.01	0.03	0.02	**40.00**	0.00
Total nitrogen	mg N/L	0.05/0.7*	0.05	87	94	7.73	0.7	0.7	0.3	95	97	2.08	**80.00**
Total phosphorus	mg/L	0.01/0.04*	0.01	9.71	9.56	1.56	0.05	0.14	0.04	9.6	9.4	2.11	**111.11**
% Exceedance**						**0%**						**25%**	**0%**

Footnotes:

*Different MDL on Nov 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-93 Meadowbank 2020 Bulk Fuel QAQC (ST-40)

Parameter	Sample Date		06/10/2020*						2020-06-10						2020-06-10					
			ST-40.1						ST-40.2						ST-40.3					
	Unit	MDL	Field Blank	Lab Blank	Duplicate*	Original	RPD (FD/N)	RPD (FB/LB)	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Nutrients and Chlorophyll a																				
Total ammonia as NH4	mg/L	0.01	0.02	-	0.01	0.01	0.00	-	0.03	-	0.01	0.01	0.00	-	0.01	-	0.02	NA	-	-
Un-Ionized Ammonia. calculated	mg/L	0.01	0.01	0.12	0.01	0.01	0.00	*169.23*	0.01	0.12	0.01	0.01	0.00	*169.23*	0.01	0.12	0.01	0.4	*190.24*	*169.23*
General Organics																				
Total oil and grease	mg/L	1	1	1	1	2	**66.67**	0.00	2	1	1	3	**100.00**	**66.67**	3	1	2	2	0.00	**100.00**
Total Metals																				
Arsenic	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	-	0.001	0.0008	**22.22**	-	0.0005	-	0.0011	0.001	9.52	-
Copper	mg/L	0.0005	0.0005	-	0.0045	0.0056	*21.78*	-	0.0005	-	0.0035	0.0036	2.82	-	0.0005	-	0.0029	0.0031	6.67	-
Lead	mg/L	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	-	0.0003	0.0003	0.00	-	0.0003	-	0.0003	0.0003	0.00	-
Nickel	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	-	0.0006	0.0011	**58.82**	-	0.0005	-	0.0009	0.0009	0.00	-
Zinc	mg/L	0.001	0.001	-	0.003	0.001	**100.00**	-	0.001	-	0.035	0.005	*150.00*	-	0.001	-	0.001	0.002	**66.67**	-
Volatile Organics																				
Benzene	µg/L	0.2 / 0.1*	0.2	-	0.1	0.2	**66.67**	-	0.2	-	0.2	0.2	0.00	-	0.2	-	0.2	0.2	0.00	-
Ethylbenzene	µg/L	0.1	0.1	-	0.1	0.1	0.00	-	0.1	-	0.1	0.1	0.00	-	0.1	-	0.1	0.1	0.00	-
Toluene	µg/L	1 / 0.1*	1	-	0.1	1	**163.64**	-	1	-	1	1	0.00	-	1	-	1	1	0.00	-
Xylenes	µg/L	0.4 / 0.1*	0.4	-	0.1	0.4	**120.00**	-	0.4	-	0.4	0.4	0.00	-	0.4	-	0.4	0.4	0.00	-
% Exceedance**							**0%**	**0%**					**0%**	**0%**					**0%**	**0%**

Footnotes:

*Different MDL for Duplicate on Oct 2020 and ST-37.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

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: 17 duplicate samples, 17 field blanks and 17 trip blanks were collected from a total of 68 samples, representing 26.5%;

- Surface water monitoring programs: 30 duplicate samples, 31 field blanks and 22 trip blanks were collected from a total of 206 samples, representing 16%;

- Bulk fuel storage facilities monitoring program: no duplicate, field blanks or trip blank samples for 2020 as no water was discharged from secondary containment; and

- Dike Construction and Dewatering: QAQC sampling events conducted within the dewatering program are rated as having high analytical precision.

This represents approximately 21.9% 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 8-94 to 8-110 for the MDMER and EEM, Surface Water, STP, respectively and Appendix 39 for the dike construction and dewatering results.. The following is a brief summary of the QA/QC results, per sampling program:

- MDMER and EEM (Tables 8-94 and 8-95): All the duplicate samples collected were considered as having high analytical precision except for four (4) having medium analytical precision of 13% to 25% .

- Surface Water (Tables 8-96 and 8-110): All QAQC sampling events conducted within the surface water quality program are rated as having high analytical precision except for (1) having a medium analytical precision of 17%.

- Dike Construction and Dewatering Results (Appendix 39):All QAQC sampling events conducted within the dewatering program are rated as having high analytical precision. .

RPD values were also calculated for field blanks and lab blanks in 2020 as part of the updated QAQC plan submitted in July 2020. All field blank samples are considered to have 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 2020. 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.

Each equipment used for field measurement are calibrated prior each usage. Calibration datasheet are kept for future reference, if needed.

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 33: *Core Receiving Environment Monitoring Program 2019* – Sections 3;

- Appendix 46: *Air Quality and Dustfall Monitoring Report 2020*– Section 4.4.

Table 8-94 Whale Tail 2020 MDMER QAQC (ST-MDMER-5-7-8-11)

ST-MDMER-5	Sample date		1/6/2020							2/11/2020							3/8/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																							
TSS	mg/L	1	1	1	1	3	2	**40.00**	0.00	1	1	1	8	10	*22.22*	0.00	1	1	1	2	2	0.00	0.00
Major Ions																							
Cyanide	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Total Metals																							
Arsenic	mg/L	0.0005	0.0023	0.0013	-	0.0062	0.0062	0.00	-	0.0005	0.0005	-	0.008	0.0069	14.77	-	0.0005	0.0005	0.0005	0.0022	0.0018	20.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0008	0.0006	**28.57**	-	0.0005	0.0005	-	0.0021	0.002	4.88	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Lead	mg/L	0.0003/ 0.00017*	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	0.0003	0.0003	0.0006	**66.67**	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0031	0.0027	13.79	-	0.0005	0.0005	-	0.0027	0.0028	3.64	-	0.0005	0.0005	0.0005	0.0019	0.0021	10.00	0.00
Zinc	mg/L	0.001	0.001	0.002	-	0.01	0.008	*22.22*	-	0.001	0.001	-	0.008	0.007	13.33	-	0.002	0.001	0.001	0.012	0.014	15.38	0.00
Radionuclides																							
Radium-226	Bq/l	0.002	0.002	0.007	0.002	0.002	0.011	**138.46**	**111.11**	0.009	0.01	0.002	0.012	0.011	8.70	**133.33**	0.009	0.002	0.002	0.013	0.016	**20.69**	0.00
% Exceedance**								**0%**	**0%**						**0%**	**0%**						**0%**	**0%**

ST-MDMER-5	Sample date		4/16/2020							5/11/2020							09/07/2020*						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																							
TSS	mg/L	1	1	1	1	2	2	0.00	0.00	1	1	1	2	2	0.00	0.00	1	1	1	4	1	**120.00**	0.00
Major Ions																							
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Total Metals																							
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.0018	0.0017	5.71	-	0.0005	0.0005	-	0.0031	0.0032	3.17	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0018	0.0019	5.41	-	0.0005	0.0005	-	0.0014	0.0017	19.35	-	0.0005	0.0005	0.0005	0.0008	0.001	**22.22**	0.00
Lead	mg/L	0.0003/ 0.00017*	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0025	0.0022	12.77	-	0.0005	0.0005	-	0.002	0.0025	**22.22**	-	0.0005	0.0005	0.0005	0.0024	0.0023	4.26	0.00
Zinc	mg/L	0.001	0.001	0.001	-	0.012	0.011	8.70	-	0.001	0.001	0.001	0.005	0.017	*109.09*	0.00	0.001	0.001	0.001	0.003	0.003	0.00	0.00
Radionuclides																							
Radium-226	Bq/l	0.002	0.006	0.005	0.002	0.009	0.01	10.53	**85.71**	0.009	0.006	0.002	0.013	0.014	7.41	**100.00**	0.002	0.002	0.002	0.002	0.002	0.00	0.00
% Exceedance**								**0%**	**0%**						**0%**	**0%**						**0%**	**0%**

ST-MDMER-5	Sample date		10/13/2020*							11/01/2020*						
	Unit	**MDL**	**Trip Blank**	**Field Blank**	**Lab Blank**	**Duplicate**	**Original**	**RPD (FD/N)**	**RPD (FB/LB)**	**Trip Blank**	**Field Blank**	**Lab Blank**	**Duplicate**	**Original**	**RPD (FD/N)**	**RPD (FB/LB)**
Conventional Parameters																
TSS	mg/L	1	1	1	1	3	2	**40.00**	0.00	3	3	1	8	9	11.76	**100.00**
Major Ions																
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.012	0.012	0.00	0.00	0.001	0.001	0.001	0.018	0.019	5.41	0.00
Total Metals																
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0021	0.002	4.88	0.00	0.0005	0.0005	0.0005	0.0028	0.0022	**24.00**	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0023	0.0025	8.33	0.00	0.0005	0.0006	0.0005	0.0021	0.0021	0.00	18.18
Lead	mg/L	0.0003/ 0.00017*	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0079	0.0088	10.78	0.00	0.0005	0.0005	0.0005	0.0044	0.0044	0.00	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.009	0.009	0.00	0.00	0.001	0.001	0.001	0.002	0.004	**66.67**	0.00
Radionuclides																
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.017	0.01	**51.85**	0.00	0.002	0.002	0.002	0.009	0.012	**28.57**	0.00
% Exceedance**								**0%**	**0%**						**0%**	**0%**

Footnotes:

*Different MDL after Sep 7 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

ST-MDMER-7	Sample date		4/27/2020							6/14/2020							09/07/2020*						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																							
TSS	mg/L	1	2	1	1	2	3	**40.00**	0.00	1	1	1	1	3	**100.00**	0.00	1	1	1	6	5	18.18	0.00
Major Ions																							
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.025	0.024	4.08	0.00	0.001	0.001	0.001	0.013	0.01	26.09	0.00	0.001	0.001	0.001	0.006	0.006	0.00	0.00
Total Metals																							
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.0143	0.0162	12.46	-	0.0005	0.0005	-	0.0054	0.0052	3.77	-	0.0005	0.0005	0.0005	0.0038	0.0034	11.11	0.00
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0046	0.0052	12.24	-	0.0005	0.0005	-	0.001	0.0016	**46.15**	-	0.0005	0.0005	0.0005	0.0007	0.0008	13.33	0.00
Lead	mg/L	0.0003/ 0.00017*	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0167	0.0202	18.97	-	0.0005	0.0005	-	0.012	0.0131	8.76	-	0.0005	0.0005	0.0005	0.0216	0.0235	8.43	0.00
Zinc	mg/L	0.001	0.001	0.001	-	0.003	0.006	**66.67**	-	0.001	0.001	-	0.012	0.015	22.22	-	0.001	0.001	0.001	0.01	0.013	26.09	0.00
Radionuclides																							
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.094	0.098	4.17	0.00	0.002	0.002	0.002	0.026	0.024	8.00	0.00	0.002	0.002	0.002	0.013	0.02	42.42	0.00
% Exceedance**								**0%**	**0%**						**25%**	**0%**						**13%**	**0%**

Footnotes:

*Different MDL after Sep 7 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

ST-MDMER-8	Sample date		6/17/2020							7/7/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																
TSS	mg/L	1	1	1	1	4	3	**28.57**	0.00	1	1	1	5	6	18.18	0.00
Major Ions																
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.014	0.015	6.90	0.00	0.001	0.001	0.001	0.038	0.037	2.67	0.00
Total Metals																
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0068	0.0085	22.22	0.00	0.0005	0.0005	-	0.0043	0.0047	8.89	-
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0009	**57.14**	0.00	0.0005	0.0005	-	0.0046	0.0048	4.26	-
Lead	mg/L	0.0003/ 0.00017*	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	-	0.0003	0.0003	0.00	-
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.023	0.0266	14.52	-	0.0005	0.0005	-	0.0228	0.0217	4.94	-
Zinc	mg/L	0.001	0.001	0.001	-	0.008	0.012	*40.00*	-	0.001	0.001	-	0.008	0.009	11.76	-
Radionuclides																
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.033	0.033	0.00	0.00	0.002	0.002	0.002	0.041	0.043	4.76	0.00
% Exceedance**								**13%**	**0%**						**0%**	**0%**

ST-MDMER-8	Sample date		09/21/2020*							10/05/2020*						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																
TSS	mg/L	1	1	2	1	3	2	**40.00**	**66.67**	1	1	1	4	4	0.00	0.00
Major Ions																
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.004	0.004	0.00	0.00	0.001	0.001	0.001	0.018	0.019	5.41	0.00
Total Metals																
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.002	0.0023	13.95	0.00	0.0005	0.0005	0.0005	0.0056	0.0055	1.80	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0011	0.0008	**31.58**	0.00	0.0005	0.0005	0.0005	0.0015	0.0016	6.45	0.00
Lead	mg/L	0.0003/ 0.00017*	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0208	0.0212	1.90	0.00	0.0005	0.0005	0.0005	0.0201	0.0216	7.19	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.012	0.011	8.70	0.00	0.001	0.001	0.001	0.002	0.002	0.00	0.00
Radionuclides																
Radium-226	Bq/l	0.002	0.002	1.149	0.002	0.002	0.002	0.00	*199.30*	0.002	0.002	0.002	0.012	0.022	*58.82*	0.00
% Exceedance**								**0%**	**0%**						**0%**	**0%**

Footnotes:

*Different MDL after Sep 21 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

ST-MDMER-11	Sample date		11/7/2020							12/1/2020							12/7/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																							
TSS	mg/L	1	1	1	1	2	3	**40.00**	0.00	1	1	1	1	1	0.00	0.00	1	1	1	3	2	**40.00**	0.00
Major Ions																							
Cyanide	mg/L	0.001	0.001	0.001	0.005	0.04	0.04	0.00	**133.33**	0.001	0.001	0.001	0.003	0.003	0.00	0.00	0.001	0.001	0.001	0.02	0.019	5.13	0.00
Total Metals																							
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0019	0.0021	10.00	0.00	0.0005	0.0005	0.0005	0.0018	0.0016	11.76	0.00	0.0005	0.0005	0.0005	0.0011	0.0017	**42.86**	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0038	0.0038	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.0006	18.18	0.00	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Lead	mg/L	0.00017	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.006	0.0054	10.53	0.00	0.0005	0.0005	0.0005	0.004	0.0029	**31.88**	0.00	0.0005	0.0005	0.0005	0.0036	0.0039	8.00	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.006	0.004	**40.00**	0.00	0.001	0.001	0.001	0.014	0.011	24.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Radionuclides																							
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.014	0.01	**33.33**	0.00	0.002	0.002	0.002	0.006	0.007	15.38	0.00	0.002	0.002	0.002	0.019	0.013	**37.50**	0.00
% Exceedance*								**0%**	**0%**						**13%**	**0%**						**0%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-95 Whale Tail 2020 EEM QAQC

ST-MDMER-5-EEM																							
Parameter	Sample date		11-Feb-20							8-Jun-20 *							1-Sep-20						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																							
Hardness	mg CaCO3/L	1	1	1	-	60	67	11.02	-	1	1	1	70	79	12.08	0.00	1	1	-	99	94	5.18	-
Total alkalinity, as CaCO3	mg CaCO3/L	5/2*	31	31	12	55	55	0.00	**88.37**	5	4	5	25	28	11.32	22.22	17	17	12	20	20	0.00	**34.48**
Major Ions																							
Chloride	mg/L	0.5	0.5	0.5	0.5	23.1	23	0.43	0.00	0.5	0.5	0.5	29.3	29.1	0.68	0.00	0.5	0.5	0.5	58.6	59	0.68	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	14	16.5	16.39	0.00	0.6	0.6	0.6	31.8	31.8	0.00	0.00	0.6	0.6	0.6	4.1	4.3	4.76	0.00
Nutrients and Chlorophyll a																							
Total Ammonia	mg-N/L	0.01	0.01	0.01	0.01	0.11	0.12	8.70	0.00	0.01	0.01	0.01	0.64	0.64	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.00	0.00
Nitrate	mg-N/L	0.01	0.01	0.01	0.01	0.11	0.1	9.52	0.00	0.01	0.01	0.01	1.05	1.32	22.78	0.00	0.01	0.01	0.01	0.02	0.01	**66.67**	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total Metals																							
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.023	0.031	**29.63**	0.00	0.006	0.006	0.006	0.024	0.031	**25.45**	0.00	0.006	0.006	0.006	0.058	0.042	**32.00**	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00004	-	0.00002	0.00002	0.00	-
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0006	0.0006	0.0006	0.0007	0.0014	**66.67**	0.00	0.0006	0.0006	-	0.0006	0.0006	0.00	-
Cobalt	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	-	0.0019	0.002	5.13	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Iron	mg/L	0.01	0.01	0.01	-	1.1	1.2	8.70	-	0.01	0.01	0.01	0.4	0.48	18.18	0.00	0.04	0.01	-	0.12	0.1	18.18	-
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.216	0.2381	9.73	-	0.0005	0.0005	0.0005	0.2857	0.3304	14.51	0.00	0.0005	0.0005	-	0.0574	0.055	4.27	-
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.002	0.0024	18.18	-	0.0005	0.0005	0.0005	0.0012	0.0014	15.38	0.00	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Selenium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Uranium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-
% Exceedance**								**0%**	**0%**						**6%**	**7%**						**0%**	**0%**

*Different MDL on June 8 2020.

*Different MDL on June 8 2020.

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.
RPD = Relative Percent Difference; MDL: Mean Detection Limit

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

N = Parent sample (original sample)

FD = Field Duplicate

FB = Field Blank

LB = Lab Blank

ST-MDMER-7-EEM																
Parameter	Sample date		27-Apr-20							14-Jun-20						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																
Hardness	mg CaCO3/L	1	1	1	-	429	419	2.36	-	1	1	-	77	85	9.88	-
Total alkalinity, as CaCO3	mg CaCO3/L	2	3	3	5	60	75	22.22	**50.00**	4	4	5	26	21	21.28	22.22
Major Ions																
Chloride	mg/L	0.5	0.5	0.5	0.5	203.8	213.6	4.70	0.00	0.5	0.5	0.5	37.9	38	0.26	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	57.4	60.9	5.92	0.00	0.6	0.6	0.6	36.9	36.1	2.19	0.00
Nutrients and Chlorophyll a																
Total Ammonia	mg-N/L	0.01	0.01	0.01	-	2.33	1.68	32.42	-	0.03	0.01	-	0.92	0.9	2.20	-
Nitrate	mg-N/L	0.01	0.01	0.01	0.01	11	10.9	0.91	0.00	0.01	0.01	0.01	2.44	2.52	3.23	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total Metals																
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.066	0.07	5.88	0.00	0.006	0.006	0.006	0.006	0.01	**50.00**	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00002	0.00002	0.00002	0.00006	**100.00**	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0009	0.0011	**20.00**	-	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Cobalt	mg/L	0.0005	0.0005	0.0005	-	0.0032	0.0029	9.84	-	0.0005	0.0005	0.0005	0.0021	0.0022	4.65	0.00
Iron	mg/L	0.01	0.01	0.01	-	0.12	0.1	18.18	-	0.01	0.01	-	0.19	0.21	10.00	-
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.5323	0.5131	3.67	-	0.0005	0.0005	-	0.2955	0.3309	11.30	-
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0191	0.0179	6.49	-	0.0005	0.0005	-	0.0011	0.0017	**42.86**	-
Selenium	mg/L	0.001	0.001	0.001	-	0.002	0.002	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Uranium	mg/L	0.001	0.001	0.001	-	0.009	0.009	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-
% Exceedance*								**11%**	**0%**						**6%**	**10%**

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

N = Parent sample (original sample)

FD = Field Duplicate

FB = Field Blank

LB = Lab Blank

ST-MDMER-8-EEM																							
Parameter	Sample date		17-Jun-20							22-Jun-20							26-Jul-20						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Hardness	mg CaCO3/L	1	1	1	1	138	146	5.63	0.00	1	1	-	151	157	3.90	-	1	1	1	156	151	3.26	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	2/5*	4	4	5	31	34	9.23	**22.22**	6	6	12	38	38	0.00	**66.67**	9	9	12	42	42	0.00	**28.57**
Major Ions																							
Chloride	mg/L	0.5	0.5	0.5	0.5	46.2	46.2	0.00	0.00	0.5	0.6	0.5	52.7	52.3	0.76	18.18	0.5	0.5	0.5	49.4	48.3	2.25	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	37.5	34.6	8.04	0.00	0.6	0.6	0.6	36.7	35.8	2.48	0.00	0.6	0.6	0.6	48.8	46.3	5.26	0.00
Nutrients and Chlorophyll a																							
Total Ammonia	mg N/L	0.01	0.01	0.01	0.01	1.13	1.15	1.75	0.00	0.01	0.07	0.01	2.02	2.01	0.50	**150.00**	0.01	0.01	0.05	1.3	1.3	0.00	**133.33**
Nitrate	mg N/L	0.01	0.01	0.01	0.01	3.01	3.05	1.32	0.00	0.01	0.01	0.01	2.45	2.96	18.85	0.00	0.02	0.01	0.01	3.28	2.29	35.55	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total Metals																							
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.042	0.036	15.38	0.00	0.006	0.006	0.006	0.01	0.02	**66.67**	0.00	0.006	0.006	0.006	0.006	0.006	0.00	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Cobalt	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	-	0.0022	0.0021	4.65	-	0.0005	0.0005	0.0005	0.002	0.0017	16.22	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.52	0.54	3.77	0.00	0.01	0.01	-	0.41	0.38	7.59	-	0.01	0.01	0.01	0.45	0.41	9.30	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.4443	0.4723	6.11	-	0.0005	0.0016	-	0.5146	0.5255	2.10	-	0.0005	0.0011	0.0005	0.4091	0.3755	8.56	**75.00**
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	-	0.0033	0.0032	3.08	-	0.0005	0.0005	0.0005	0.0057	0.0049	15.09	0.00
Selenium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Uranium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00
% Exceedance**								**0%**	**0%**						**0%**	**0%**						**6%**	**0%**

*Detection limit value for Total alkalinity, as CaCO3 = 5 after 22/06/2020

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

N = Parent sample (original sample)

FD = Field Duplicate

FB = Field Blank

LB = Lab Blank

Water Quality Monitoring Exposure Area Whale Tail Lake South Basin (ST-MDMER-5-EEM-WTSE)									
Parameter	Sample date		1/20/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters									
Hardness	mg CaCO3/L	1	1	1	1	39	35	10.81	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	5	21	17	12	47	33	**35.00**	**34.48**
TSS	mg/L	1	1	1	1	4	2	**66.67**	0.00
WQ03- Major Ions									
Chloride	mg/L	0.5	0.5	0.5	0.5	17.2	17.4	1.16	0.00
Sulphate	mg/L	0.6	1.2	1.8	0.6	7.6	9.5	22.22	**100.00**
Cyanide	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Nutrients and Chlorophyll a									
Total ammonia as NH4	mg-N/L	0.01	0.01	0.01	0.01	0.08	0.08	0.00	0.00
Nitrate	mg-N/L	0.01	0.01	0.01	0.01	0.04	0.04	0.00	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.02	**66.67**	0.00
Total Metals									
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.01	**50.00**	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0009	**57.14**	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Calcium	mg/L	0.03	0.03	0.03	0.03	11.2	10.3	8.37	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Iron	mg/L	0.01	0.02	0.02	0.01	0.09	0.12	*28.57*	**66.67**
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Magnesium	mg/L	0.02	0.02	0.02	0.02	2.69	2.26	17.37	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.0863	0.0686	22.85	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0023	0.002	13.95	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Uranium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Zinc	mg/L	0.001	0.002	0.001	-	0.003	0.002	**40.00**	-
Radionuclides									
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.003	0.002	**40.00**	0.00
% Exceedance*								**7%**	**0%**

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

N = Parent sample (original sample)

FD = Field Duplicate

FB = Field Blank

LB = Lab Blank

Water Quality Monitoring Exposure Area Mammoth Lake (ST-MDMER-7-EEM-MAME-2)																
Parameter	Sample date		4/26/2020							5/24/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																
Hardness	mg CaCO3/L	1	1	1	-	93	87	6.67	-	1	1	1	94	92	2.15	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	2	2	3	5	24	25	4.08	**50.00**	3	3	-	25	27	7.69	-
TSS	mg/L	1	2	2	1	3	2	**40.00**	**66.67**	1	1	1	1	1	0.00	0.00
Major Ions																
Chloride	mg/L	0.5	0.5	0.5	0.5	44.7	45	0.67	0.00	0.5	0.5	0.5	47	46.6	0.85	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	17	16.6	2.38	0.00	0.6	0.6	0.6	17.3	18	3.97	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.002	0.003	**40.00**	0.00	0.001	0.001	0.001	0.005	0.004	**22.22**	0.00
Nutrients and Chlorophyll a																
Total ammonia as NH4	mg-N/L	0.01	0.01	0.01	-	0.18	0.2	10.53	-	0.01	0.01	-	0.27	0.25	7.69	-
Nitrate	mg-N/L	0.01	0.01	0.01	0.01	1.14	1.15	0.87	0.00	0.01	0.01	0.01	1.1	1.05	4.65	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total Metals																
Aluminum	mg/L	0.006	0.006	0.008	0.006	0.009	0.006	**40.00**	**28.57**	0.006	0.006	0.006	0.006	0.006	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.0017	0.0015	12.50	-	0.0005	0.0005	-	0.0016	0.0015	6.45	-
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0006	0.0017	**95.65**	-	0.0006	0.0006	0.0006	0.0006	0.0008	**28.57**	0.00
Cobalt	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0011	0.0011	0.00	-	0.0005	0.0005	0.0005	0.0012	0.0013	8.00	0.00
Iron	mg/L	0.01	0.01	0.01	-	0.02	0.02	0.00	-	0.01	0.01	0.01	0.04	0.04	0.00	0.00
Lead	mg/L	0.0003	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Magnesium	mg/L	0.02	0.02	0.02	-	6.17	5.5	11.48	-	0.02	0.02	0.02	6.13	6.09	0.65	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0014	0.0012	15.38	-	0.0005	0.0005	0.0005	0.001	0.0014	**33.33**	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0036	0.0033	8.70	-	0.0005	0.0005	0.0005	0.0037	0.0036	2.74	0.00
Selenium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Uranium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Zinc	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00
WQ08- Radionuclides																
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.009	0.005	**57.14**	0.00	0.002	0.002	0.002	0.002	0.005	**85.71**	0.00
% Exceedance*								**0%**	**0%**						**0%**	**0%**

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

N = Parent sample (original sample)

FD = Field Duplicate

FB = Field Blank

LB = Lab Blank

Water Quality Monitoring Exposure Area Mammoth Lake (ST-MDMER-8-EEM-MAME-2)									
Parameter	Sample date		8/2/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters									
Hardness	mg CaCO3/L	1	1	1	-	65	68	4.51	-
Total alkalinity, as CaCO3	mg CaCO3/L	5	10	20	-	22	47	**72.46**	-
Major Ions									
Chloride	mg/L	0.5	0.5	0.5	0.5	23.3	23.8	2.12	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	14.7	14.4	2.06	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Nutrients and Chlorophyll a									
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	0.01	0.11	0.11	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.01	0.86	0.85	1.17	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total Metals									
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.006	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.0011	0.0018	**48.28**	-
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00002	0.00002	0.00	-
Calcium	mg/L	0.03	0.03	0.03	-	18.6	19.1	2.65	-
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0006	0.0006	0.00	-
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0006	0.0007	15.38	-
Iron	mg/L	0.01	0.01	0.01	-	0.03	0.05	**50.00**	-
Lead	mg/L	0.0003	0.0003	0.0003	-	0.0003	0.0003	0.00	-
Magnesium	mg/L	0.02	0.02	0.02	-	4.62	5.06	9.09	-
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.0218	0.0216	0.92	-
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0009	0.0012	**28.57**	-
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0027	0.0031	13.79	-
Selenium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Uranium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Zinc	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Radionuclides									
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.003	0.005	**50.00**	0.00
% Exceedance*								**0%**	**0%**

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

N = Parent sample (original sample)

FD = Field Duplicate

FB = Field Blank

LB = Lab Blank

Water Quality Monitoring Reference Area Third Portage Lake (ST-MMER-5-EEM-TPS)									
Parameter	**Sample date**	**MDL**	1/21/2020						
	Sample type		Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (N/FD)	RPD (FB/LB)
	Unit								
Conventional Parameters									
Hardness	mg CaCO3/L	1	1	1	1	13	13	0.00	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	5	26	28	12	24	47	**64.79**	**80.00**
TSS	mg/L	1	1	1	1	1	1	0.00	0.00
Major Ions									
Chloride	mg/L	0.5	0.5	0.5	0.5	0.9	0.9	0.00	0.00
Sulphate	mg/L	0.6	0.8	0.6	0.6	6.4	7.4	14.49	0.00
Cyanide	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Nutrients and Chlorophyll a									
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total phosphorus	mg/L	0.01/0.04*	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total Metals									
Aluminum	mg/L	0.006/0.005*	0.006	0.006	0.006	0.006	0.006	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Lead	mg/L	0.0003/0.00017*	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.0008	0.001	**22.22**	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0006	0.0006	0.00	0.00
Selenium	mg/L	0.001/0.005*	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Thallium	mg/L	0.0008/0.0002*	0.0008	0.0008	0.0008	0.0008	0.0008	0.00	0.00
Uranium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Zinc	mg/L	0.001	0.001	0.001	-	0.002	0.002	0.00	-
Radionuclides									
Radium-226	Bq/l	0.002	0.003	0.003	0.002	0.004	0.007	**54.55**	40.00
% Exceedance **								**0%**	**0%**

*Different MDL after Nov 15 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

N = Parent sample (original sample)

FD = Field Duplicate

FB = Field Blank

LB = Lab Blank

Table 8-96 Whale Tail 2020 Attenuation Pond Pre-Treatment QAQC (ST-WT-1)

Parameter	Sample date		7/20/2020						12/07/2020*					
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters														
Hardness	mg CaCO3/L	1	1	1	197	222	11.93	0.00	1	1	105	115	9.09	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	5	7	12	70	70	0.00	**52.63**	22	-	68	68	0.00	-
Total suspended solids	mg/L	1	1	1	49	49	0.00	0.00	1	1	40	1	*190.24*	0.00
Total dissolved solids	mg/L	1	2	12	322	327	1.54	*142.86*	2	-	168	166	1.20	-
Major Ions														
Chloride	mg/L	0.5	0.5	0.5	65.9	68.3	3.58	0.00	0.5	0.5	34.2	34.4	0.58	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.14	0.14	0.00	0.00	0.02	0.02	0.16	0.17	6.06	0.00
Sulphate	mg/L	0.6	0.6	0.6	55	56.6	2.87	0.00	0.6	0.6	16.6	16.2	2.44	0.00
Nutrients and Chlorophyll a														
Total ammonia as NH4	mg N/L	0.01	0.02	0.01	4.64	4.58	1.30	**66.67**	0.01	0.01	1.03	1.04	0.97	0.00
Un-Ionized Ammonia, calculated	mg N/L	0.01	0.01	0.01	0.05	0.05	0.00	0.00	0.01	0.01	0.02	0.02	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	4.37	6.57	40.22	0.00	0.01	0.01	0.81	0.96	16.95	0.00
Nitrite	mg N/L	0.01	0.01	0.01	0.36	0.33	8.70	0.00	0.01	0.01	0.08	0.08	0.00	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.04	0.03	**28.57**	0.00	0.01	0.01	0.02	0.01	**66.67**	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.02	0.05	**85.71**	0.00
Total Metals														
Aluminum	mg/L	0.006/0.005*	0.006	0.006	0.514	0.731	34.86	0.00	0.005	0.006	0.446	0.561	22.84	18.18
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0253	0.0285	11.90	0.00	0.0005	0.0005	0.0182	0.0177	2.79	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0951	0.1048	9.70	0.00	0.0016	0.0005	0.0732	0.0763	4.15	**104.76**
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	0.00002	0.00013	**146.67**	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0073	0.0087	17.50	0.00	0.0006	0.0006	0.0054	0.0089	*48.95*	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0048	0.0062	*25.45*	0.00	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Iron	mg/L	0.01	0.03	0.01	1.7	2.5	38.10	**100.00**	0.01	0.01	1.3	1.7	26.67	0.00
Lead	mg/L	0.0003/ 0.00017*	0.0003	0.0003	0.0003	0.0007	**80.00**	0.00	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Manganese	mg/L	0.0005	0.002	0.0005	0.5405	0.675	22.13	**120.00**	0.0005	0.0005	0.3208	0.3612	11.85	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0094	0.0089	5.46	0.00	0.0005	0.0005	0.0048	0.0053	9.90	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0338	0.0419	21.40	0.00	0.0005	0.0005	0.0056	0.0064	13.33	0.00
Selenium	mg/L	0.001/ 0.0005*	0.001	0.001	0.002	0.001	**66.67**	0.00	0.0005	0.001	0.0005	0.0005	0.00	**66.67**
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001	0.001	-	0.003	0.006	**66.67**	-	0.001	0.001	0.001	0.001	0.00	0.00
% Exceedance**							**17%**	**0%**					**7%**	**0%**

Footnotes:

*Different MDL after Dec 7 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-97 Whale Tail 2020 Whale Tail Attenuation Pond Discharge to Mammoth Lake West Diffuser QAQC (ST-WT-2)

Parameter	Sample date		5/25/2020							6/23/2020					
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters															
Hardness	mg CaCO3/L	1	1	1	-	177	163	8.24	-	161	1	1	145	*197.26*	*197.53*
Total alkalinity, as CaCO3	mg CaCO3/L	2	3	3	-	48	53	9.90	-	6	12	34	34	0.00	**66.67**
Total suspended solids	mg/L	1	1	1	1	8	8	0.00	0.00	1	1	5	7	**33.33**	0.00
Major Ions															
Chloride	mg/L	0.5	0.5	0.5	0.5	76.9	77.5	0.78	0.00	0.5	0.5	50.9	51.1	0.39	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	24.8	22.8	8.40	0.00	0.6	0.6	46.2	46.1	0.22	0.00
Nutrients and Chlorophyll a															
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	-	2.06	2.01	2.46	-	0.01	0.01	2.02	2	1.00	0.00
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.02	0.02	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.01	3.87	4.13	6.50	0.00	0.01	0.01	4.12	3.11	27.94	0.00
Nitrite	mg N/L	0.01	0.01	0.01	-	0.34	0.07	*131.71*	-	0.01	0.01	0.26	0.2	26.09	0.00
Total nitrogen	mg N/L	0.05	0.05	0.05	0.05	2	2.1	4.88	0.00	0.15	0.05	2.3	2.7	16.00	**100.00**
Total phosphorus	mg/L	0.01	0.01	0.01	0.1	0.01	0.01	0.00	*163.64*	0.01	0.01	0.01	0.01	0.00	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	0.02	0.02	0.00	0.00	0.02	0.01	0.01	0.01	0.00	**66.67**
General Organics															
Total recoverable hydrocarbons	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.00	0.00	0.1	0.1	0.1	0.1	0.00	0.00
Total Metals															
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.031	0.056	**57.47**	0.00	0.006	0.006	0.006	0.006	0.00	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0009	0.0007	**25.00**	0.00	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.008	0.0072	10.53	0.00	0.0085	0.0005	0.0005	0.0078	*175.90*	*177.78*
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.098	0.0995	1.52	0.00	0.0915	0.0005	0.0005	0.0606	*196.73*	*197.83*
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Boron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.00	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0011	0.0018	**48.28**	-	0.0014	0.0006	0.0006	0.0006	0.00	**80.00**
Copper	mg/L	0.0005	0.0005	0.0005	-	0.005	0.005	0.00	-	0.0044	0.0005	0.0005	0.0036	**151.22**	**159.18**
Iron	mg/L	0.01	0.01	0.01	-	0.74	0.77	3.97	-	0.03	0.01	0.01	0.01	0.00	**100.00**
Lead	mg/L	0.0003	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Lithium	mg/L	0.005	0.005	0.005	-	0.008	0.007	13.33	-	0.007	0.005	0.005	0.007	**33.33**	**33.33**
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.2671	0.2534	5.26	-	0.6439	0.0005	0.0005	0.419	*199.52*	*199.69*
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0096	0.009	6.45	-	0.0018	0.0005	0.0005	0.0018	**113.04**	**113.04**
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.007	0.0073	4.20	-	0.0241	0.0005	0.0005	0.0195	*190.00*	*191.87*
Selenium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.00	0.00
Strontium	mg/L	0.005	0.005	0.005	-	0.332	0.309	7.18	-	0.279	0.005	0.005	0.248	*192.09*	*192.96*
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Tin	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.00	0.00
Titanium	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.00	0.00
Uranium	mg/L	0.001	0.001	0.001	-	0.002	0.002	0.00	-	0.001	0.001	0.001	0.001	0.00	0.00

Parameter	Sample date		5/25/2020							6/23/2020					
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Vanadium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Zinc	mg/L	0.001	0.001	0.001	-	0.004	0.004	0.00	-	0.019	0.001	0.002	0.014	*150.00*	*180.00*
Dissolved Metals															
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.006	0.006	0.006	0.006	0.00	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0017	0.0016	6.06	0.00	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0035	0.0039	10.81	0.00	0.0085	0.0005	0.0005	0.0078	*175.90*	*177.78*
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.1087	0.1099	1.10	0.00	0.0915	0.0005	0.0005	0.0606	*196.73*	*197.83*
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Boron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.00	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00006	0.00002	**100.00**	-	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0014	0.0006	0.0006	0.0006	0.00	**80.00**
Copper	mg/L	0.0005	0.0005	0.0005	-	0.004	0.0033	19.18	-	0.0044	0.0005	0.0005	0.0036	**151.22**	**159.18**
Iron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.03	0.01	0.01	0.01	0.00	**100.00**
Lead	mg/L	0.0003	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Lithium	mg/L	0.005	0.005	0.005	-	0.007	0.007	0.00	-	0.007	0.005	0.005	0.007	**33.33**	**33.33**
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.2964	0.292	1.50	0.00	0.6439	0.0005	0.0005	0.419	*199.52*	*199.69*
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0108	0.0106	1.87	-	0.0018	0.0005	0.0005	0.0018	**113.04**	**113.04**
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0057	0.0056	1.77	-	0.0241	0.0005	0.0005	0.0195	*190.00*	*191.87*
Selenium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.00	0.00
Strontium	mg/L	0.005	0.005	0.005	-	0.337	0.351	4.07	-	0.279	0.005	0.005	0.248	*192.09*	*192.96*
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Tin	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.00	0.00
Titanium	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.00	0.00
Uranium	mg/L	0.001	0.001	0.001	-	0.002	0.002	0.00	-	0.001	0.001	0.001	0.001	0.00	0.00
Vanadium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Zinc	mg/L	0.001	0.001	0.001	-	0.005	0.005	0.00	-	0.019	0.001	0.002	0.014	*150.00*	*180.00*
% Exceedance*								**0%**	**0%**					**3%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-98 Whale Tail 2020 Whale Tail Attenuation Pond Discharge to Mammoth Lake East Diffuser QAQC (ST-WT-2a)

Parameter	Sample date		6/17/2020						7/7/2020						8/17/2020							9/7/2020						
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																												
Hardness	mg CaCO3/L	1	1	1	147	155	5.30	0.00	1	-	179	169	5.75	-	1	1	1	163	178	8.80	0.00	1	1	1	173	179	3.41	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	2	4	5	32	30	6.45	**22.22**	7	12	45	45	0.00	**52.63**	16	15	12	44	48	8.70	**22.22**	25	18	12	45	43	4.55	**40.00**
Total suspended solids	mg/L	1	1	1	4	4	0.00	0.00	1	1	6	6	0.00	0.00	1	1	1	4	5	**22.22**	0.00	1	1	1	6	6	0.00	0.00
Total organic carbon	mg/L	0.2	0.2	-	4.3	4.3	0.00	-	0.4	-	2.3	2.3	0.00	-	0.2	0.2	0.2	3.8	3.8	0.00	0.00	0.2	0.2	0.2	4.4	4.6	4.44	0.00
Dissolved organic carbon	mg/L	0.2	0.6	-	5	5.2	3.92	-	0.2	-	2.2	2.2	0.00	-	0.8	0.8	0.2	3.4	3.4	0.00	**120.00**	0.2	0.2	0.2	5	5.2	3.92	0.00
Major Ions																												
Chloride	mg/L	0.5	0.5	0.5	46.1	46.6	1.08	0.00	0.5	0.5	62.3	61.9	0.64	0.00	0.5	0.5	0.5	64.4	67.3	4.40	0.00	0.5	0.5	0.5	67.7	68.1	0.59	0.00
Sulphate	mg/L	0.6	0.6	0.6	35.3	35.1	0.57	0.00	0.6	0.6	38.9	38.8	0.26	0.00	1	1.4	0.6	37	37.9	2.40	**80.00**	0.6	0.6	0.6	65.5	65.3	0.31	0.00
Nutrients and Chlorophyll a																												
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	1.16	1.15	0.87	0.00	0.01	0.01	1.79	1.78	0.56	0.00	0.01	0.01	0.01	0.47	0.48	2.11	0.00	0.01	0.01	0.01	0.71	0.7	1.42	0.00
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	2.44	2.08	15.93	0.00	0.01	0.01	3.67	5.25	35.43	0.00	0.01	0.01	0.01	0.88	0.89	1.13	0.00	0.01	0.02	0.01	1.25	1.44	14.13	**66.67**
Nitrite	mg N/L	0.01	0.01	0.01	0.16	0.15	6.45	0.00	0.01	0.01	0.2	0.14	*35.29*	0.00	0.01	0.01	0.01	0.04	0.05	**22.22**	0.00	0.01	0.01	0.01	0.09	0.09	0.00	0.00
Total nitrogen	mg N/L	0.05	0.05	0.05	1.4	1.2	15.38	0.00	0.05	0.05	1.8	1.8	0.00	0.00	0.05	0.05	0.05	1	0.79	23.46	0.00	0.05	0.05	0.05	0.98	1.3	28.07	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.02	0.01	0.01	0.01	0.00	**66.67**	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
General Organics																												
Total recoverable hydrocarbons	mg/L	0.1	0.1	0.1	0.1	0.1	0.00	0.00	0.1	0.1	0.1	0.1	0.00	0.00	0.1	0.1	0.1	0.1	0.1	0.00	0.00	0.1	0.1	0.1	0.1	0.1	0.00	0.00
Total Metals																												
Aluminum	mg/L	0.006	0.006	0.006	0.066	0.052	*23.73*	0.00	0.006	-	0.006	0.006	0.00	-	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.006	0.006	0.006	0.02	0.016	**22.22**	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0056	0.0023	83.54	0.00	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0006	0.0005	18.18	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0138	0.0084	48.65	0.00	0.0005	-	0.0047	0.0056	17.48	-	0.0005	0.0005	0.0005	0.0025	0.0034	**30.51**	0.00	0.0005	0.0005	0.0005	0.0031	0.0034	9.23	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0818	0.0858	4.77	0.00	0.0005	-	0.0941	0.091	3.35	-	0.0005	0.0005	0.0005	0.0871	0.0973	11.06	0.00	0.0005	0.0005	0.0005	0.0849	0.1015	17.81	0.00
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Boron	mg/L	0.01	0.01	0.01	0.07	0.01	**150.00**	0.00	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00007	0.00002	**111.11**	0.00	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	-	0.0006	0.0006	0.00	-	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0032	0.0008	**120.00**	0.00	0.0005	-	0.0042	0.0042	0.00	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0007	0.0005	**33.33**	0.00
Iron	mg/L	0.01	0.01	0.01	0.63	0.62	1.60	0.00	0.01	-	0.61	0.69	12.31	-	0.01	0.01	0.01	0.77	0.85	9.88	0.00	0.01	0.01	0.01	0.54	0.56	3.64	0.00
Lead	mg/L	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	-	0.0003	0.0003	0.00	-	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Lithium	mg/L	0.005	0.005	0.005	0.006	0.007	15.38	0.00	0.005	-	0.006	0.006	0.00	-	0.005	0.005	0.005	0.005	0.006	18.18	0.00	0.005	0.005	0.005	0.006	0.006	0.00	0.00
Manganese	mg/L	0.0005	0.0005	-	0.4812	0.509	5.62	-	0.0005	-	0.5679	0.5966	4.93	-	0.0008	0.0006	0.0005	0.2551	0.2875	11.94	18.18	0.0005	0.0048	0.0005	0.6357	0.6592	3.63	**162.26**
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	-	0.0031	0.0005	**144.44**	-	0.0005	-	0.0052	0.0061	15.93	-	0.0005	0.0005	0.0005	0.0013	0.0014	7.41	0.00	0.0005	0.0005	0.0005	0.0012	0.0015	**22.22**	0.00
Nickel	mg/L	0.0005	0.0005	-	0.0287	0.0253	12.59	-	0.0005	-	0.0234	0.0247	5.41	-	0.0005	0.0005	0.0005	0.0108	0.0133	20.75	0.00	0.0005	0.0005	0.0005	0.0218	0.0232	6.22	0.00
Selenium	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Strontium	mg/L	0.005	0.005	-	0.262	0.272	3.75	-	0.005	-	0.299	0.321	7.10	-	0.005	0.005	0.005	0.298	0.325	8.67	0.00	0.005	0.005	0.005	0.281	0.303	7.53	0.00
Thallium	mg/L	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Tin	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00

Titanium	mg/L	0.01	0.01	-	0.01	0.01	0.00	-	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Uranium	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Vanadium	mg/L	0.0005	0.0005	-	0.0007	0.0005	**33.33**	-	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Zinc	mg/L	0.001	0.001	-	0.013	0.011	16.67	-	0.001	-	0.009	0.009	0.00	-	0.001	0.001	0.001	0.01	0.011	9.52	0.00	0.001	0.001	0.001	0.006	0.006	0.00	0.00
Dissolved Metals																												
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.006	-	0.006	0.006	0.00	-	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.006	0.006	0.006	0.006	0.006	0.00	0.00
Antimony	mg/L	0.0001	0.0001	-	0.001	0.0014	33.33	-	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	-	0.0071	0.006	16.79	-	0.0005	-	0.0025	0.0035	**33.33**	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.0007	**33.33**	0.00
Barium	mg/L	0.0005	0.0005	-	0.0762	0.0661	14.20	-	0.0005	-	0.078	0.1042	28.76	-	0.0005	0.0005	0.0005	0.0681	0.0741	8.44	0.00	0.0005	0.0005	0.0005	0.0782	0.0797	1.90	0.00
Beryllium	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Boron	mg/L	0.01	0.01	-	0.01	0.01	0.00	-	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Cadmium	mg/L	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	-	0.00003	0.00002	**40.00**	-	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0011	-	0.0006	0.0006	0.00	-	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	-	0.0018	0.0015	18.18	-	0.0005	-	0.0034	0.0041	18.67	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.0009	**57.14**	0.00
Iron	mg/L	0.01	0.01	-	0.01	0.01	0.00	-	0.01	-	0.08	0.09	11.76	-	0.01	0.01	0.01	0.03	0.05	**50.00**	0.00	0.05	0.01	0.01	0.08	0.01	**155.56**	0.00
Lead	mg/L	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	-	0.0003	0.0003	0.00	-	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Lithium	mg/L	0.005	0.005	-	0.006	0.005	18.18	-	0.005	-	0.006	0.008	**28.57**	-	0.005	0.005	0.005	0.005	0.006	18.18	0.00	0.005	0.005	0.005	0.005	0.007	**33.33**	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.02	0.00001	0.00001	0.00	*199.80*	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	-	0.002	0.0017	16.22	-	0.0005	-	0.0044	0.0065	*38.53*	-	0.0005	0.0005	0.0005	0.0008	0.0009	11.76	0.00	0.0005	0.0005	0.0005	0.0009	0.0015	**50.00**	0.00
Nickel	mg/L	0.0005	0.0005	-	0.0249	0.0217	13.73	-	0.0008	-	0.0205	0.0252	20.57	-	0.0005	0.0005	0.0005	0.0093	0.0109	15.84	0.00	0.0005	0.0005	0.0005	0.021	0.0257	20.13	0.00
Selenium	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Strontium	mg/L	0.005	0.005	-	0.238	0.212	11.56	-	0.005	-	0.256	0.32	22.22	-	0.005	0.005	0.005	0.23	0.25	8.33	0.00	0.005	0.005	0.005	0.269	0.326	19.16	0.00
Thallium	mg/L	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0007	-	0.0002	0.0002	0.00	-	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Tin	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Titanium	mg/L	0.01	0.01	-	0.01	0.01	0.00	-	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Uranium	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Vanadium	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Zinc	mg/L	0.001	0.001	-	0.01	0.012	18.18	-	0.001	-	0.009	0.01	10.53	-	0.001	0.001	0.001	0.008	0.008	0.00	0.00	0.001	0.001	0.001	0.012	0.007	*52.63*	0.00
% Exceedance*						**0%**	**5%**						**6%**	**0%**						**3%**	**0%**						**3%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-99 Whale Tail 2020 WRSF QAQC (ST-WT-3)

Parameter	Sample date		6/1/2020							7/5/2020*						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																
Hardness	mg CaCO3/L	1	1	1	1	68	68	0.00	0.00	1	1	1	94	90	4.35	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	2/5*	5	4	-	39	36	8.00	-	2	7	12	28	30	6.90	**52.63**
TSS	mg/L	1	1	1	1	85	88	3.47	0.00	1	1	1	6	5	18.18	0.00
Major Ions																
Chloride	mg/L	0.5	0.5	0.5	0.5	3.4	3.5	2.90	0.00	0.5	0.5	0.5	10.7	10.1	5.77	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.02	0.04	0.04	0.00	0.00	0.02	0.02	0.02	0.06	0.06	0.00	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	17.3	15.4	11.62	0.00	0.6	0.6	-	49	57.9	16.65	-
Nutrients and Chlorophyll a																
Total ammonia as NH4	mg/L	0.01	0.05	0.01	0.01	0.67	0.67	0.00	0.00	0.01	0.01	0.01	0.29	0.3	3.39	0.00
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg/L	0.01	0.01	0.01	0.01	0.69	0.69	0.00	0.00	0.01	0.01	0.01	2.4	2.03	16.70	0.00
Nitrite	mg/L	0.01	0.01	0.01	0.01	0.1	0.07	*35.29*	0.00	0.01	0.02	-	0.08	0.01	**155.56**	-
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.11	0.12	8.70	0.00	0.01	0.01	0.01	-	0.01	-	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total Metals																
Aluminum	mg/L	0.006	0.006	0.006	0.006	3.226	3.759	15.26	0.00	0.006	0.006	0.006	0.183	0.188	2.70	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0304	0.0268	12.59	0.00	0.0005	0.0005	0.0005	0.0024	0.0019	**23.26**	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0604	0.0579	4.23	0.00	0.0005	0.0005	0.0005	0.0386	0.0393	1.80	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.0001	0.00002	**133.33**	0.00	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0613	0.0709	14.52	0.00	0.0006	0.0006	0.0006	0.0022	0.0021	4.65	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0077	0.0083	7.50	0.00	0.0005	0.0005	0.0005	0.0018	0.0017	5.71	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	5.7	5.9	3.45	0.00	0.01	0.01	0.01	0.51	0.48	6.06	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0024	0.0021	13.33	0.00	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.3302	0.3218	2.58	0.00	0.0005	0.0006	0.0005	0.1614	0.1855	13.89	18.18
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00002	0.00002	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0008	0.001	**22.22**	0.00	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0412	0.0438	6.12	0.00	0.0005	0.0005	0.0005	0.0247	0.0222	10.66	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.002	0.001	**66.67**	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Zinc	mg/L	0.001	0.001	0.001	-	0.009	0.011	*20.00*	-	0.001	0.001	-	0.003	0.003	0.00	-
Dissolved Metals																
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.006	0.006	0.006	0.006	0.006	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0134	0.0131	2.26	0.00	0.0005	0.0005	0.0005	0.0006	0.0011	**58.82**	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0241	0.0227	5.98	0.00	0.0005	0.0005	0.0005	0.0379	0.041	7.86	0.00
Cadmium	mg/L	0.00002	0.00002	0.00005	0.00002	0.00004	0.00002	**66.67**	**85.71**	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.002	0.0013	**42.42**	0.00	0.0005	0.0005	-	0.0008	0.0013	**47.62**	-
Iron	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	-	0.05	0.05	0.00	-

Parameter	Sample date		6/1/2020							7/5/2020*						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.0003	0.0003	-	0.0003	0.0003	0.00	-
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.2297	0.2092	9.34	0.00	0.0005	0.0005	-	0.1193	0.1483	21.67	-
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	18.18	0.00	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0117	0.0114	2.60	0.00	0.0005	0.0005	-	0.0205	0.0236	14.06	-
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	-	0.001	0.001	0.00	-
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	-	0.002	0.004	**66.67**	-
% Exceedance**								**0%**	**0%**						**2%**	**0%**

Footnotes:

*Different MDL after Jul 5th 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-100 Whale Tail 2020 Pit Sump QAQC (ST-WT-4)

Parameter	Sample date		3/5/2020							10/07/2020*							12/09/2020*						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																							
Hardness	mg CaCO3/L	1	1	1	-	319	299	6.47	-	1	1	1	244	210	14.98	0.00	1	1	1	144	159	9.90	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	5	30	30	12	87	88	1.14	**85.71**	18	23	-	85	84	1.18	-	20	23	-	83	84	1.20	-
TSS	mg/L	1	1	1	1	6	7	15.38	0.00	1	1	1	106	113	6.39	0.00	1	1	1	3	1	**100.00**	0.00
Major Ions																							
Chloride	mg/L	0.5	0.5	0.5	0.5	170.6	169.3	0.76	0.00	0.5	0.5	0.5	68.7	69	0.44	0.00	0.5	0.5	0.5	64.7	65.4	1.08	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.02	0.16	0.16	0.00	0.00	0.02	0.02	0.02	0.24	0.24	0.00	0.00	0.02	0.02	0.02	0.24	0.24	0.00	0.00
Sulphate	mg/L	0.6	1.6	0.6	0.6	15.2	12.3	21.09	0.00	0.6	0.6	0.6	32.6	30	8.31	0.00	0.6	0.6	0.6	20.1	19.5	3.03	0.00
Nutrients and Chlorophyll a																							
Ammoniacal Nitrogen as NH4	mg-N/L	0.01	0.01	0.01	0.01	0.56	0.54	3.64	0.00	0.01	0.01	0.01	1.27	1.29	1.56	0.00	0.01	0.01	0.01	1.69	1.77	4.62	0.00
Un-Ionized Ammonia, calculated	mg-N/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.12	0.05	0.05	0.00	*169.23*	0.01	0.01	0.01	0.04	0.05	**22.22**	0.00
Nitrate	mg-N/L	0.01	0.01	0.01	0.01	0.75	0.68	9.79	0.00	0.01	0.01	0.01	1.26	1.15	9.13	0.00	0.01	0.01	0.01	1.25	1.38	9.89	0.00
Nitrite	mg-N/L	0.01	0.01	0.01	-	0.02	0.02	0.00	-	0.01	0.01	0.01	0.11	0.15	30.77	0.00	0.01	0.01	0.01	0.07	0.05	**33.33**	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.02	0.01	0.01	0.00	**66.67**
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.02	0.01	0.01	0.02	**66.67**	**66.67**	0.01	0.01	0.01	0.01	0.07	**150.00**	0.00	0.01	0.01	0.01	0.02	0.02	0.00	0.00
Total Metals																							
Aluminum	mg/L	0.006/0.005*	0.006	0.008	0.006	0.07	0.075	6.90	**28.57**	0.005	0.024	0.006	3.695	3.195	14.51	**120.00**	0.005	0.005	0.006	0.024	0.04	**50.00**	18.18
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.0354	0.0368	3.88	-	0.0005	0.0005	0.0005	0.0408	0.0329	21.44	0.00	0.0005	0.0005	0.0005	0.0261	0.032	20.31	0.00
Barium	mg/L	0.0005	0.0005	0.0005	-	0.1663	0.1605	3.55	-	0.0005	0.0005	0.0005	0.1444	0.1354	6.43	0.00	0.0005	0.0005	0.0005	0.0881	0.0849	3.70	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00005	0.00007	33.33	-	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.001	0.001	0.00	-	0.0006	0.0012	0.0006	0.1409	0.1258	11.32	**66.67**	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	0.0005	0.0061	0.0049	*21.82*	0.00	0.001	0.0005	0.0005	0.0045	0.0054	18.18	0.00
Iron	mg/L	0.01	0.01	0.01	-	1.3	1.3	0.00	-	0.01	0.11	0.01	6.1	5.4	12.17	*166.67*	0.01	0.01	0.01	0.09	0.14	*43.48*	0.00
Lead	mg/L	0.0003/ 0.00017*	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**	0.00017	0.00017	0.0003	0.00017	0.0005	**98.51**	**55.32**
Manganese	mg/L	0.0005	0.0005	0.0005	-	1.2312	1.1796	4.28	-	0.0005	0.0008	0.0005	0.2309	0.2013	13.70	**46.15**	0.0005	0.0005	0.0005	0.195	0.1915	1.81	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0096	0.0096	0.00	-	0.0005	0.0005	0.0005	0.0105	0.0089	16.49	0.00	0.0005	0.0005	0.0005	0.0077	0.0086	11.04	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0023	0.0022	4.44	-	0.0005	0.0005	0.0005	0.041	0.036	12.99	0.00	0.0005	0.0005	0.0005	0.0052	0.041	154.98	0.00
Selenium	mg/L	0.001/ 0.0005*	0.001	0.001	-	0.001	0.001	0.00	-	0.0005	0.0005	0.001	0.0005	0.0005	0.00	**66.67**	0.0005	0.0005	0.001	0.0005	0.0005	0.00	**66.67**
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001	0.003	0.002	-	0.003	0.004	**28.57**	-	0.001	0.001	0.001	0.002	0.002	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Dissolved Metals																							
Aluminum	mg/L	0.006/ 0.005*	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.005	0.005	0.006	0.009	0.005	**57.14**	18.18	0.005	0.005	0.006	0.005	0.005	0.00	18.18
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.0042	0.0053	*23.16*	-	0.0005	0.0005	0.0005	0.0288	0.0302	4.75	0.00	0.0005	0.0005	0.0005	0.027	0.0272	0.74	0.00
Barium	mg/L	0.0005	0.0005	0.0005	-	0.1315	0.1499	13.08	-	0.0005	0.0005	0.0005	0.0777	0.0725	6.92	0.00	0.0005	0.0005	0.0005	0.086	0.0875	1.73	0.00
Cadmium	mg/L	0.00002	0.00002	0.00007	-	0.00005	0.00005	0.00	-	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	0.0005	0.0018	0.0015	18.18	0.00	0.0005	0.0005	0.0005	0.0051	0.0081	45.45	0.00

Iron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Lead	mg/L	0.0003/ 0.00017*	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.9521	1.0998	14.40	-	0.0005	0.0005	0.0005	0.1508	0.1295	15.20	0.00	0.0005	0.0005	0.0005	0.1752	0.1876	6.84	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00004	0.00003	0.00001	0.00001	0.00001	0.00	**100.00**	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0079	0.0092	15.20	-	0.0005	0.0005	0.0005	0.0102	0.0087	15.87	0.00	0.0005	0.0005	0.0005	0.0075	0.0087	14.81	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.001	0.0017	**51.85**	-	0.0005	0.0005	0.0005	0.0045	0.0043	4.55	0.00	0.0005	0.0005	0.0005	0.0039	0.0106	*92.41*	0.00
Selenium	mg/L	0.001/0 .0005*	0.001	0.001	-	0.001	0.001	0.00	-	0.0005	0.0005	0.001	0.0005	0.0005	0.00	**66.67**	0.0005	0.0005	0.001	0.0005	0.0005	0.00	**66.67**
Silver	mg/L	0.0001	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
% Exceedance**								**2%**	**0%**						**5%**	**0%**						**7%**	**0%**

Footnotes:

*Different MDL after Oct 7 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-101 Whale Tail 2020 Lake A47 QAQC (ST-WT-6)

Parameter	Sample date		7/26/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate*	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters									
Hardness	mg CaCO3/L	1	1	1	1	192	199	3.58	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	5	10	31	12	37	51	*31.82*	**88.37**
TSS	mg/L	1	1	1	1	5	6	18.18	0.00
TDS	mg/L	1	1	1	12	261	258	1.16	*169.23*
Total organic carbon	mg/L	0.2	0.5	0.3	0.2	6.9	7.1	2.86	**40.00**
Dissolved organic carbon	mg/L	0.2	0.7	0.7	0.2	5.2	5.1	1.94	**111.11**
Major Ions									
Carbonate	mg CaCO3/L	5	5	5	12	5	5	0.00	**82.35**
Bicarbonate	mg CaCO3/L	5	10	31	12	37	51	*31.82*	**88.37**
Chloride	mg/L	0.5	0.5	0.5	0.5	98.5	98	0.51	0.00
Reactive Silica	mg/L	0.02	0.02	0.02	0.02	0.73	0.7	4.20	0.00
Sulphate	mg/L	0.6	0.6	0.8	0.6	18.7	18.9	1.06	**28.57**
Nutrients and Chlorophyll a									
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	0.05	0.01	0.01	0.00	**133.33**
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Total nitrogen	mg N/L	0.05	0.05	0.05	0.05	0.48	0.53	9.90	0.00
Total phosphorus	mg/L	0.04/0.01*	0.04	0.04	0.04	0.01	0.04	**120.00**	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.02	0.02	0.01	0.02	0.01	**66.67**	**66.67**
Total Metals									
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.045	0.049	8.51	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0079	0.0079	0.00	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.1322	0.1408	6.30	0.00
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0013	0.0019	**37.50**	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0007	0.0009	25.00	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.57	0.65	13.11	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Lithium	mg/L	0.005	0.005	0.005	0.005	0.012	0.013	8.00	0.00
Manganese	mg/L	0.0005	0.0007	0.0005	0.0005	0.2332	0.2619	11.59	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Strontium	mg/L	0.005	0.005	0.005	0.005	0.38	0.396	4.12	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Tin	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00

Parameter	Sample date		7/26/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate*	Original	RPD (FD/N)	RPD (FB/LB)
Titanium	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Dissolved Metals									
Aluminum	mg/L	0.006	0.041	0.006	0.006	0.006	0.006	0.00	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Arsenic	mg/L	0.0005	0.0043	0.0005	0.0005	0.0057	0.0056	1.77	0.00
Barium	mg/L	0.0005	0.0046	0.0005	0.0005	0.1448	0.1439	0.62	0.00
Beryllium	mg/L	0.0005	0.0011	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Cadmium	mg/L	0.00002	0.0024	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0025	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0033	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Iron	mg/L	0.01	0.08	0.01	0.01	0.06	0.06	0.00	0.00
Lead	mg/L	0.0003	0.0006	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Lithium	mg/L	0.005	0.005	0.005	0.005	0.013	0.013	0.00	0.00
Manganese	mg/L	0.0005	0.0101	0.0005	0.0005	0.2285	0.2267	0.79	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0016	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Nickel	mg/L	0.0005	0.0027	0.0005	0.0005	0.0093	0.0095	2.13	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Strontium	mg/L	0.005	0.005	0.005	0.005	0.412	0.413	0.24	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Tin	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Titanium	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Vanadium	mg/L	0.0005	0.0022	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Zinc	mg/L	0.001	0.007	0.001	0.001	0.001	0.001	0.00	0.00
% Exceedance**								**0%**	**0%**

Footnotes:

*Different MDL for the Total phosphorus Duplicate

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-102 Whale Tail 2020 South Whale Tail Channel (Lake A45) QAQC (ST-WT-13)

Parameter	Sample date		8/9/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters									
TSS	mg/L	1	1	1	-	1	1	0.00	-
Major Ions									
Sulphate	mg/L	0.6	0.6	0.6	0.6	1.5	1.4	6.90	0.00
Total Metals									
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.027	0.038	**33.85**	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.0042	0.0046	9.09	-
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Lead	mg/L	0.00017	0.00017	0.00017		0.00017	0.00017	0.00	-
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0007	0.0012	**52.63**	-
Zinc	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
% Exceedance*								**0%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-103 Whale Tail 2020 Lake A16 Outlet QAQC (ST-WT-14)

Parameter	Sample date		8/3/2020						09/17/2020*	
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Original	Trip Blank
Conventional Parameters										
Hardness	mg CaCO3/L	1	1	-	50	47	6.19	-	55	1
Total alkalinity, as CaCO3	mg CaCO3/L	5	30	12	49	49	0.00	**85.71**	50	20
TSS	mg/L	1	1	1	1	1	0.00	0.00	3	1
TDS	mg/L	1	1	12	76	76	0.00	*169.23*	82	1
Total organic carbon	mg/L	0.2	0.3	0.2	2.1	1.9	10.00	**40.00**	2	0.2
Dissolved organic carbon	mg/L	0.2	1	0.2	2	2	0.00	**133.33**	3.3	1.5
Major Ions										
Carbonate	mg CaCO3/L	5	5	12	5	5	0.00	**82.35**	5	5
Bicarbonate	mg CaCO3/L	5	30	12	49	49	0.00	**85.71**	50	20
Chloride	mg/L	0.5	0.5	0.5	18	18.4	2.20	0.00	18.7	0.5
Reactive silica	mg/L	0.01	0.05	-	1.31	1.16	12.15	-	2.02	0.01
Sulphate	mg/L	0.6	13.7	0.6	10.8	12.5	14.59	*183.22*	13.3	1.6
Nutrients and Chlorophyll a										
Total ammonia as NH4	mg N/L	0.01	0.01	-	0.01	0.02	**66.67**	-	0.05	0.01
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01
Nitrate	mg N/L	0.01	0.01	0.01	0.41	0.18	77.97	0.00	0.54	0.01
Nitrite	mg N/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01
Total nitrogen	mg N/L	0.05	0.88	0.05	0.17	0.21	**21.05**	*178.49*	0.11	0.05
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.02	0.02	0.00	0.00	0.01	0.01
Total Metals										
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.006	0.006
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0007	0.0008	13.33	0.00	0.0005	0.0005
Barium	mg/L	0.0005	0.0005	0.0005	0.02	0.0198	1.01	0.00	0.0212	0.0005
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01
Cadmium	mg/L	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00002
Chromium	mg/L	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0006	0.0006
Copper	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0008	0.0005
Iron	mg/L	0.01	0.01	-	0.03	0.01	**100.00**	-	0.03	0.01
Lead	mg/L	0.0003/ 0.00017*	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.00017	0.00017
Lithium	mg/L	0.005	0.005	0.005	0.005	0.005	0.00	0.00	0.005	0.005
Manganese	mg/L	0.0005	0.0005	0.0005	0.0031	0.001	**102.44**	0.00	0.0074	0.0005
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00002	0.00001
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005
Nickel	mg/L	0.0005	0.0005	0.0005	0.0013	0.0007	**60.00**	0.00	0.0008	0.0005
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001
Silver	mg/L	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001
Thallium	mg/L	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002
Tin	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001
Titanium	mg/L	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01
Uranium	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001
Vanadium	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005
Zinc	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001
Dissolved Metals										
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.006	0.006
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005
Barium	mg/L	0.0005	0.0008	0.0005	0.0173	0.0183	5.62	**46.15**	0.016	0.0005
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01
Chromium	mg/L	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0006	0.0006
Copper	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005

Parameter	Sample date		8/3/2020						09/17/2020*	
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Original	Trip Blank
Iron	mg/L	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.04
Lead	mg/L	0.0003/ 0.00017*	0.0003	-	0.0003	0.0003	0.00	-	0.00017	0.00017
Lithium	mg/L	0.005	0.005	-	0.005	0.005	0.00	-	0.005	0.005
Manganese	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0028	0.0005
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001
Molybdenum	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005
Nickel	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0006	0.0005
Selenium	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001
Thallium	mg/L	0.0002	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002
Tin	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001
Titanium	mg/L	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01
Uranium	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001
Vanadium	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005
Zinc	mg/L	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001
% Exceedance**							**3%**	**0%**		

Footnotes:

*Different MDL after Sep 17 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-104 Whale Tail 2020 Lake A15 QAQC (ST-WT-15)

Parameter	Sample date		8/3/2020					
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters								
Hardness	mg CaCO3/L	1	1	-	44	44	0.00	-
Total alkalinity, as CaCO3	mg CaCO3/L	5	10	12	20	47	**80.60**	18.18
TSS	mg/L	1	1	1	1	2	**66.67**	0.00
TDS	mg/L	1	1	12	75	74	1.34	*169.23*
Total organic carbon	mg/L	0.2	0.6	0.2	1.7	1.8	5.71	**100.00**
Dissolved organic carbon	mg/L	0.2	0.8	0.2	1.6	1.5	6.45	**120.00**
Carbonate	mg CaCO3/L	5	5	12	5	5	0.00	**82.35**
Bicarbonate	mg CaCO3/L	5	10	12	20	47	**80.60**	18.18
Major Ions								
Chloride	mg/L	0.5	0.5	0.5	17.5	13.1	28.76	0.00
Reactive silica	mg/L	0.01	0.16	-	1.16	1.17	0.86	-
Sulphate	mg/L	0.6	0.6	0.6	10.6	11.4	7.27	0.00
Nutrients and Chlorophyll a								
Total ammonia as NH4	mg N/L	0.01	0.01	-	0.01	0.01	0.00	-
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.47	0.49	4.17	0.00
Nitrite	mg N/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total nitrogen	mg N/L	0.05	0.05	0.05	0.29	0.22	**27.45**	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.02	0.01	0.02	0.03	**40.00**	**66.67**
Total Metals								
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.00	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0175	0.0192	9.26	0.00
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Cadmium	mg/L	0.00002	0.00002	-	0.00002	0.00002	0.00	-
Chromium	mg/L	0.0006	0.0006	-	0.0006	0.0006	0.00	-
Copper	mg/L	0.0005	0.0005	-	0.0007	0.0005	**33.33**	-
Iron	mg/L	0.01	0.01	-	0.01	0.01	0.00	-
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Lithium	mg/L	0.005	0.005	0.005	0.005	0.005	0.00	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0006	0.0005	18.18	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0012	0.0009	**28.57**	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00

Parameter	Sample date		8/3/2020					
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Thallium	mg/L	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Tin	mg/L	0.001	0.001	-	0.001	0.001	0.00	-
Titanium	mg/L	0.01	0.01	-	0.01	0.01	0.00	-
Uranium	mg/L	0.001	0.001	-	0.001	0.001	0.00	-
Vanadium	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Zinc	mg/L	0.001	0.001	-	0.001	0.001	0.00	-
Dissolved Metals								
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.00	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0159	0.0136	15.59	0.00
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Chromium	mg/L	0.0006	0.0006	-	0.0006	0.0006	0.00	-
Copper	mg/L	0.0005	0.0012	-	0.0005	0.0005	0.00	-
Iron	mg/L	0.01	0.01	-	0.01	0.01	0.00	-
Lead	mg/L	0.0003	0.0003	-	0.0003	0.0003	0.00	-
Lithium	mg/L	0.005	0.005	-	0.005	0.005	0.00	-
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Nickel	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Selenium	mg/L	0.001	0.001	-	0.001	0.001	0.00	-
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Tin	mg/L	0.001	0.001	-	0.001	0.001	0.00	-
Titanium	mg/L	0.01	0.01	-	0.01	0.01	0.00	-
Uranium	mg/L	0.001	0.001	-	0.001	0.001	0.00	-
Vanadium	mg/L	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Zinc	mg/L	0.001	0.001	-	0.001	0.001	0.00	-
% Exceedance*							**2%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-105 Whale Tail Dike Seepage 2020 QAQC (ST-WT-17)

Parameter	Sample date		2/10/2020							3/8/2020							3/16/2020				
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Original	RPD (FB/LB)
Conventional Parameters																					
Hardness	mg CaCO3/L	1	1	1	-	56	57	1.77	-	1	1	-	70	71	1.42	-	1	1	-	71	-
Total alkalinity, as CaCO3	mg CaCO3/L	5/2*	30	33	12	62	62	0.00	**93.33**	30	31	12	72	71	1.40	**88.37**	32	26	12	80	**73.68**
Solids	mg/L	1	2	2	1	112	110	1.80	**66.67**	6	4	1	116	118	1.71	**120.00**	-	-	-	130	-
TSS	mg/L	1	1	1	1	7	7	0.00	0.00	1	1	1	4	4	0.00	0.00	1	1	1	6	0.00
TDS	mg/L	1/2*	1	1	-	88	87	1.14	-	1	1	-	106	107	0.94	-	1	1	-	109	-
Major Ions																					
Chloride	mg/L	0.5	0.5	0.5	0.5	17.9	17.5	2.26	0.00	0.5	0.5	0.5	21.1	18.4	13.67	0.00	0.5	0.5	0.5	19.6	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.02	0.12	0.12	0.00	0.00	0.02	0.04	0.02	0.11	0.1	9.52	**66.67**	0.02	0.02	0.02	0.11	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	8.6	8.5	1.17	0.00	0.8	2.1	0.6	10.2	8.1	22.95	**111.11**	0.6	0.6	0.6	9.3	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	-	0.001	-
Nutrients and Chlorophyll a																					
Total ammonia as NH4	mg-N/L	0.01	0.01	0.01	0.01	0.04	0.02	**66.67**	0.00	0.01	0.01	0.01	0.04	0.01	**120.00**	0.00	0.01	0.01	0.01	0.02	0.00
Un-Ionized Ammonia, calculated	mg-N/L	0.01	0.01	0.01	-	0.02	0.01	**66.67**	-	0.01	0.01	0.01	0.02	0.01	**66.67**	0.00	0.01	0.01	0.01	0.01	0.00
Nitrate	mg-N/L	0.01	0.01	0.01	0.01	0.14	0.16	13.33	0.00	0.01	0.01	0.01	0.18	0.18	0.00	0.00	0.01	0.01	0.01	0.31	0.00
Nitrite	mg-N/L	0.01	0.02	0.01	-	0.02	0.01	**66.67**	-	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	-	0.01	-
Total nitrogen	mg-N/L	0.05	0.05	0.05	0.05	0.25	0.33	**27.59**	0.00	0.05	0.05	0.05	0.22	0.1	**75.00**	0.00	0.05	0.05	0.05	0.2	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.02	0.02	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.02	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	0.02	0.02	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.02	0.00
General Organics																					
Total oil and grease	mg/L	1	1	1	1	1	1	0.00	0.00	1	1	1	1	1	0.00	0.00	1	1	1	3	0.00
Total Metals																					
Aluminum	mg/L	0.006	0.006	0.006	-	0.097	0.111	13.46	-	0.006	0.006	0.006	0.088	0.09	2.25	0.00	0.006	0.006	0.006	0.063	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	-	0.0001	-
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0115	0.0123	6.72	0.00	0.0005	0.0005	-	0.0113	0.0115	1.75	-	0.0005	0.0005	-	0.0146	-
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0319	0.0317	0.63	0.00	0.0005	0.0005	-	0.0423	0.0421	0.47	-	0.0009	0.0005	-	0.0284	-
Beryllium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	-	0.0005	-
Boron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	-	0.01	-
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00002	-	0.00002	-
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0006	0.0006	-	0.0029	0.0025	14.81	-	0.0006	0.0006	-	0.0019	-
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0022	0.0021	4.65	0.00	0.0005	0.0005	-	0.002	0.0023	13.95	-	0.0005	0.0005	-	0.0017	-
Iron	mg/L	0.01	0.01	0.03	-	0.2	0.25	22.22	-	0.01	0.01	-	0.19	0.18	5.41	-	0.01	0.01	-	0.14	-
Lead	mg/L	0.0003	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	-	0.0003	-
Lithium	mg/L	0.005	0.005	0.005	-	0.005	0.005	0.00	-	0.005	0.005	-	0.005	0.005	0.00	-	-	-	-	0.005	-
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.0307	0.0304	0.98	0.00	0.0005	0.0005	-	0.03	0.0288	4.08	-	0.0005	0.0005	-	0.0226	-
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0027	0.003	10.53	0.00	0.0005	0.0005	-	0.0029	0.0027	7.14	-	0.0005	0.0005	-	0.002	-
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0016	0.0015	6.45	0.00	0.0005	0.0005	-	0.002	0.0016	**22.22**	-	0.0005	0.0005	-	0.0012	-
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	-

Parameter	Sample date		2/10/2020							3/8/2020							3/16/2020				
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Original	RPD (FB/LB)
Silver	mg/L	0.0001	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	-	-	-	0.0001	-
Strontium	mg/L	0.005	0.005	0.005	-	0.202	0.211	4.36	-	0.005	0.005	-	0.341	0.322	5.73	-	0.005	0.005	-	0.38	-
Thallium	mg/L	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0002	0.0002	-	-	-
Tin	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	-
Titanium	mg/L	0.01	-	-	-	-	-	-	-	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	-	-	-
Uranium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	-
Vanadium	mg/L	0.0005	0.0005	0.0015	-	0.0009	0.0006	**40.00**	-	0.0005	0.0005	-	0.0009	0.0007	**25.00**	-	0.0005	0.0005	-	0.0009	-
Zinc	mg/L	0.001	0.002	0.001	-	0.002	0.003	**40.00**	-	0.002	0.001	-	0.002	0.001	**66.67**	-	0.001	0.001	-	0.001	-
Dissolved Metals																					
Aluminum	mg/L	0.006	0.006	0.007	-	0.006	0.006	0.00	-	0.006	0.006	0.006	0.007	0.01	**35.29**	0.00	0.006	0.006	0.006	0.026	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001	-	0.0001	-
Arsenic	mg/L	0.0005	0.0007	0.0014	0.0005	0.0141	0.0143	1.41	**94.74**	0.0005	0.0005	-	0.0099	0.0098	1.02	-	0.0005	0.0005	-	0.0125	-
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.036	0.0325	10.22	0.00	0.0005	0.0005	-	0.0352	0.0354	0.57	-	0.0005	0.0005	-	0.0255	-
Beryllium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	-	0.0005	-
Boron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	-	0.01	-
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00002	-	0.00002	-
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0006	0.0006	-	0.0011	-
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0015	0.0014	6.90	0.00	0.0005	0.0005	-	0.0017	0.0017	0.00	-	0.0005	0.0005	-	0.0013	-
Iron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	-	0.04	0.01	**120.00**	-	0.01	0.01	-	0.03	-
Lead	mg/L	0.0003	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	-	0.0003	-
Lithium	mg/L	0.005	0.005	0.005	-	0.005	0.005	0.00	-	0.005	0.005	-	0.005	0.005	0.00	-	-	-	-	0.005	-
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.0183	0.016	13.41	0.00	0.0005	0.0005	-	0.0189	0.021	10.53	-	0.0005	0.0005	-	0.0163	-
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00002	0.00001	**66.67**	0.00	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0033	0.0036	8.70	0.00	0.0005	0.0005	-	0.0025	0.0024	4.08	-	0.0005	0.0005	-	0.0021	-
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0015	0.0013	14.29	0.00	0.0005	0.0005	-	0.0013	0.0012	8.00	-	0.0005	0.0005	-	0.0009	-
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	-
Silver	mg/L	0.0001	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001	-	0.0001	0.0001	0.00	-	-	-	-	0.0001	-
Strontium	mg/L	0.005	0.005	0.005	-	0.208	0.211	1.43	-	0.005	0.005	-	0.296	0.304	2.67	-	0.005	0.005	-	0.376	-
Tin	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	-
Titanium	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	-	0.01	-
Uranium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	-
Vanadium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	-	0.0007	0.0006	15.38	-	0.0005	0.0005	-	0.0006	-
Zinc	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.003	0.001	-	0.001	0.002	**66.67**	-	0.001	0.001	-	0.004	-
% Exceedance**								**2%**	**0%**						**1%**	**0%**					**0%**

Parameter	Sample date		04/06/2020*							05/04/2020*							06/01/2020*						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																							
Hardness	mg CaCO3/L	1	1	1	-	64	69	7.52	-	1	1	-	63	70	10.53	-	1	1	1	66	68	2.99	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	5/2*	3	3	5	55	40	31.58	**50.00**	4	3	5	39	39	0.00	**50.00**	5	5	-	38	44	14.63	-
Solids	mg/L	1	2	4	1	114	118	3.45	**120.00**	26	30	1	130	130	0.00	*187.10*	54	34	1	126	126	0.00	*188.57*
TSS	mg/L	1	1	1	1	3	2	**40.00**	0.00	1	1	1	1	1	0.00	0.00	1	1	1	20	18	10.53	0.00
TDS	mg/L	1/2*	3	2	-	113	114	0.88	-	7	8	-	120	123	2.47	-	15	13	-	126	128	1.57	-
Major Ions																							
Chloride	mg/L	0.5	0.5	0.5	0.5	18.8	19.9	5.68	0.00	0.5	0.5	0.5	18	18	0.00	0.00	0.5	0.5	0.5	18.7	19.1	2.12	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.02	0.12	0.12	0.00	0.00	0.02	0.02	0.02	0.1	0.1	0.00	0.00	0.02	0.02	0.02	0.1	0.1	0.00	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	11.5	12.1	5.08	0.00	0.6	0.6	0.6	9.2	9.6	4.26	0.00	0.6	0.6	0.6	9.8	11.7	17.67	0.00
Cyanide	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Nutrients and Chlorophyll a																							
Total ammonia as NH4	mg-N/L	0.01	0.01	0.01	-	0.03	0.03	0.00	-	0.01	0.02	-	0.02	0.01	**66.67**	-	0.01	0.01	0.01	0.02	0.02	0.00	0.00
Un-Ionized Ammonia, calculated	mg-N/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.12	0.01	0.01	0.00	*169.23*	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg-N/L	0.01	0.01	0.01	0.01	0.2	0.25	22.22	0.00	0.01	0.01	0.01	0.18	0.21	15.38	0.00	0.01	0.01	0.01	0.42	0.39	7.41	0.00
Nitrite	mg-N/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total nitrogen	mg-N/L	0.05	0.1	0.05	0.05	0.21	0.18	15.38	0.00	0.05	0.05	0.05	0.15	0.16	6.45	0.00	0.05	0.05	0.05	0.08	0.17	**72.00**	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.02	**66.67**	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.02	0.01	**66.67**	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	0.02	0.02	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.03	0.03	0.00	0.00
General Organics																							
Total oil and grease	mg/L	1	1	1	1	1	1	0.00	0.00	1	1	1	1	1	0.00	0.00	1	1	1	2	1	**66.67**	0.00
Total Metals																							
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.037	0.014	**90.20**	0.00	0.006	0.006	0.006	0.039	0.041	5.00	0.00	0.014	0.01	0.006	0.227	0.255	11.62	**50.00**
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0092	0.0118	24.76	0.00	0.0005	0.0005	-	0.0083	0.0085	2.38	-	0.0005	0.0005	0.0005	0.0087	0.0087	0.00	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0344	0.0425	21.07	0.00	0.0005	0.0005	-	0.0401	0.0418	4.15	-	0.0005	0.0005	0.0005	0.0434	0.0449	3.40	0.00
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	-	0.01	0.01	0.00	-
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00012	0.00002	0.00002	0.00002	0.00	**142.86**
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.0022	**114.29**	0.00	0.0006	0.0006	-	0.0011	0.0012	8.70	-	0.0006	0.0006	0.0006	0.0076	0.0055	*32.06*	0.00
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0014	0.0016	13.33	-	0.0005	0.0005	-	0.0019	0.0024	**23.26**	-	0.0005	0.0005	0.0005	0.0016	0.0015	6.45	0.00
Iron	mg/L	0.01	0.01	0.01	-	0.09	0.1	10.53	-	0.01	0.01	-	0.11	0.12	8.70	-	0.02	0.01	0.01	0.51	0.51	0.00	0.00
Lead	mg/L	0.0003	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Lithium	mg/L	0.005	0.005	0.005	-	0.005	0.005	0.00	-	0.005	0.005	-	0.005	0.005	0.00	-	0.005	0.005	-	0.005	0.005	0.00	-
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.0211	0.0255	18.88	-	0.0005	0.0005	-	0.0196	0.0219	11.08	-	0.0005	0.0005	0.0005	0.0406	0.042	3.39	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00002	0.00003	**40.00**	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0019	0.0023	19.05	-	0.0005	0.0005	-	0.0017	0.0019	11.11	-	0.0005	0.0005	0.0005	0.0017	0.002	16.22	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.001	0.0011	9.52	-	0.0005	0.0005	-	0.0015	0.0015	0.00	-	0.0005	0.0005	0.0005	0.0041	0.0036	12.99	0.00
Selenium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Strontium	mg/L	0.005	0.005	0.005	-	0.357	0.4	11.36	-	0.005	0.005	-	0.314	0.351	11.13	-	0.005	0.005	-	0.31	0.329	5.95	-

Parameter	Sample date		04/06/2020*							05/04/2020*							06/01/2020*						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Thallium	mg/L	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-
Titanium	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-
Vanadium	mg/L	0.0005	0.0005	0.0005	-	0.0006	0.0006	0.00	-	0.0005	0.0005	-	0.0006	0.0007	15.38	-	0.0005	0.0005	-	0.001	0.001	0.00	-
Zinc	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.006	-	0.002	0.005	**85.71**	-	0.001	0.002	-	0.002	0.001	**66.67**	-
Dissolved Metals																							
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.006	0.006	0.006	0.006	0.006	0.00	0.00	0.006	0.006	0.006	0.006	0.006	0.00	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0095	0.0084	12.29	0.00	0.0005	0.0005	-	0.0071	0.0074	4.14	-	0.0005	0.0005	0.0005	0.0081	0.0077	5.06	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0367	0.0315	15.25	0.00	0.0005	0.0005	-	0.035	0.0344	1.73	-	0.0005	0.0005	0.0005	0.046	0.0417	9.81	0.00
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00004	-	0.00002	0.00002	0.00	-	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00	0.0006	0.0006	-	0.0006	0.0006	0.00	-	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0013	0.001	**26.09**	0.00	0.0005	0.0005	-	0.0017	0.0014	19.35	-	0.0005	0.0005	0.0005	0.0017	0.0015	12.50	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.02	0.01	**66.67**	0.00	0.01	0.01	-	0.02	0.02	0.00	-	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.00
Lithium	mg/L	0.005	0.005	0.005	0.005	0.005	0.005	0.00	0.00	0.005	0.005	-	0.005	0.005	0.00	-	0.005	0.005	0.005	0.005	0.005	0.00	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.02	0.0152	27.27	0.00	0.0005	0.0005	-	0.0151	0.0146	3.37	-	0.0005	0.0005	0.0005	0.029	0.0229	23.51	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0023	0.002	13.95	0.00	0.0005	0.0005	-	0.0018	0.0018	0.00	-	0.0005	0.0005	0.0005	0.0018	0.0016	11.76	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0008	0.0009	11.76	0.00	0.0005	0.0005	-	0.0012	0.001	18.18	-	0.0005	0.0005	0.0005	0.0019	0.0013	**37.50**	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Strontium	mg/L	0.005	0.005	0.005	0.005	0.341	0.324	5.11	0.00	0.005	0.005	-	0.311	0.306	1.62	-	0.005	0.005	0.005	0.358	0.31	14.37	0.00
Tin	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Titanium	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	-	0.01	0.01	0.00	-	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0006	0.0006	0.00	0.00	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.001	0.00	0.00
% Exceedance**								**8%**	**0%**						**0%**	**0%**						**2%**	**0%**

Footnotes:

*Different MDL after Apr 6 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-106 Whale Tail IVR Pit Sump 2020 QAQC (ST-WT-18)

Parameter	Sample date		10/4/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters									
Hardness	mg CaCO3/L	1	1	2	1	586	703	18.15	**66.67**
Total alkalinity, as CaCO3	mg CaCO3/L	5	19	19	-	105	105	0.00	-
TSS	mg/L	1	1	1	1	9	8	11.76	0.00
TDS	mg/L	1	1	2	-	757	766	1.18	-
Major Ions									
Chloride	mg/L	0.5	0.5	0.5	0.5	290.7	293.9	1.09	0.00
Fluoride	mg/L	0.02	0.02	0.08	0.02	0.16	0.16	0.00	**120.00**
Sulphate	mg/L	0.6	2.4	3.9	0.6	48.9	60.3	20.88	**146.67**
Nutrients and Chlorophyll a									
Ammoniacal Nitrogen as NH4	mg/L	0.01	0.01	0.01	0.12	1.81	1.82	0.55	*169.23*
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.012	0.02	0.02	0.00	18.18
Nitrate	mg/L	0.01	0.01	0.01	0.01	3.58	3.35	6.64	0.00
Nitrite	mg/L	0.01	0.01	0.01	0.01	0.34	0.35	2.90	0.00
Total phosphorus	mg/L	0.01	0.02	0.01	0.01	0.01	0.01	0.00	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total Metals									
Aluminum	mg/L	0.005	0.005	0.005	0.006	0.142	0.167	16.18	18.18
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0011	0.0028	**87.18**	0.00
Barium	mg/L	0.0005	0.0005	0.0016	0.0005	0.2713	0.3064	12.15	**104.76**
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0016	0.0022	**31.58**	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0028	0.0038	**30.30**	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.24	0.33	31.58	0.00
Lead	mg/L	0.00017	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Manganese	mg/L	0.0005	0.0005	0.0152	0.0005	2.0355	2.5679	23.13	*187.26*
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0021	0.0032	**41.51**	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0267	0.0356	28.57	0.00
Selenium	mg/L	0.0005	0.0005	0.0005	0.001	0.0005	0.0005	0.00	**66.67**
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.00	0.00
Dissolved Metals									
Aluminum	mg/L	0.005	0.005	0.005	0.006	0.005	0.005	0.00	18.18
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0007	0.0009	**25.00**	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.2425	0.2507	3.33	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0021	0.0033	**44.44**	0.00

Iron	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Lead	mg/L	0.00017	0.00017	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Manganese	mg/L	0.0005	0.0005	0.0096	0.0005	2.0768	2.0258	2.49	*180.20*
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00003	**100.00**	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.002	0.0025	**22.22**	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.0269	0.0277	2.93	0.00
Selenium	mg/L	0.0005	0.0005	0.0005	0.001	0.0005	0.0005	0.00	**66.67**
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.003	**100.00**	0.00
% Exceedance*								**9%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-107 Whale Tail Groundwater Storage Pond 1 2020 QAQC (ST-WT-20)

Parameter	Sample date		7/12/2020						8/3/2020						08/09/2020*					
	Unit	MDL	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																				
Hardness	mg CaCO3/L	1	1	1	484	468	3.36	0.00	1	1	668	645	3.50	0.00	1	-	554	634	13.47	-
Total alkalinity, as CaCO3	mg CaCO3/L	5	7	12	38	38	0.00	**52.63**	28	12	52	52	0.00	**80.00**	13	12	53	53	0.00	8.00
TDS	mg/L	1	2	12	615	610	0.82	*142.86*	1	12	915	915	0.00	*169.23*	3	12	928	943	1.60	*120.00*
TSS	mg/L	1	1	1	5	4	**22.22**	0.00	1	1	9	12	*28.57*	0.00	1	1	8	6	**28.57**	0.00
Major Ions																				
Chloride	mg/L	0.5	0.5	0.5	182.2	220.6	19.07	0.00	0.5	0.5	383.4	382.3	0.29	0.00	0.5	0.5	372.7	372.6	0.03	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.06	0.06	0.00	0.00	0.02	0.02	0.07	0.07	0.00	0.00	0.02	0.02	0.08	0.09	11.76	0.00
Sulphate	mg/L	0.6	0.6	0.6	16.9	16.6	1.79	0.00	0.6	0.6	21.3	20.5	3.83	0.00	0.6	0.6	21.2	20.5	3.36	0.00
Nutrients and Chlorophyll a																				
Ammoniacal Nitrogen as NH4	mg/L	0.01	0.01	0.05	2.37	2.38	0.42	**133.33**	0.01	-	3.76	3.8	1.06	-	0.01	0.01	4.27	4.31	0.93	0.00
Total ammonia as NH4	mg/L	0.01	0.01	-	2.4	2.4	0.00	-	0.01	-	3.81	3.85	1.04	-	0.01	0.01	4.33	4.37	0.92	0.00
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	-	0.03	0.02	**40.00**	-	0.01	0.01	0.04	0.05	**22.22**	0.00	0.01	0.01	0.06	0.06	0.00	0.00
Nitrate	mg/L	0.01	0.01	0.01	6.15	6.21	0.97	0.00	0.01	0.01	11	10.9	0.91	0.00	0.01	0.01	10.9	10.3	5.66	0.00
Nitrite	mg/L	0.01	0.01	0.01	0.1	0.1	0.00	0.00	0.01	0.01	0.17	0.15	12.50	0.00	0.01	0.01	0.21	0.2	4.88	0.00
Total Metals																				
Aluminum	mg/L	0.006	0.006	0.006	0.104	0.067	43.27	0.00	0.006	0.006	0.136	0.186	31.06	0.00	0.006	0.006	0.03	0.084	*94.74*	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0086	0.0085	1.17	0.00	0.0005	0.0005	0.008	0.0072	10.53	0.00	0.0005	0.0005	0.0048	0.0059	*20.56*	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.1711	0.1615	5.77	0.00	0.0005	0.0005	0.227	0.2039	10.72	0.00	0.0005	0.0005	0.1699	0.201	16.77	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00	0.00002	0.00002	0.00012	0.00023	*62.86*	0.00	0.00002	-	0.00002	0.00002	0.00	-
Chromium	mg/L	0.0006	0.0006	0.0006	0.0016	0.0015	6.45	0.00	0.0006	0.0006	0.0037	0.0028	**27.69**	0.00	0.0006	-	0.0006	0.0013	**73.68**	-
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.00	0.0005	0.0005	0.0022	0.002	9.52	0.00	0.0005	-	0.0008	0.0015	**60.87**	-
Iron	mg/L	0.01	0.01	0.01	0.22	0.28	24.00	0.00	0.01	0.01	0.3	0.29	3.39	0.00	0.01	0.01	0.12	0.18	40.00	0.00
Lead	mg/L	0.0003/ 0.00017*	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.0003	0.0003	0.0003	0.0003	0.00	0.00	0.00017	0.0003	0.00017	0.00017	0.00	**55.32**
Manganese	mg/L	0.0005	0.0005	0.0005	0.844	0.7983	5.57	0.00	0.0005	0.0005	1.1437	1.0858	5.19	0.00	0.0023	0.0005	0.8952	1.0765	18.39	**128.57**
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.003	0.0024	**22.22**	0.00	0.0005	0.0005	0.0036	0.0037	2.74	0.00	0.0005	0.0005	0.0019	0.0026	**31.11**	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0267	0.0267	0.00	0.00	0.0005	0.0005	0.0354	0.0346	2.29	0.00	0.0005	0.0005	0.0269	0.032	17.32	0.00
Selenium	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.001	0.001	0.00	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Thallium	mg/L	0.0002	0.0002	0.0008	0.0002	0.0002	0.00	**120.00**	0.0002	-	0.0002	0.0002	0.00	-	0.0002	-	0.0002	0.0002	0.00	-
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.00	0.001	-	0.007	0.007	0.00	-	0.001	-	0.005	0.006	18.18	-
% Exceedance**							**7%**	**0%**					**4%**	**0%**					**4%**	**0%**

Footnotes:

*Different MDL after Aug 09 2020.

RPD = Relative Percent Difference; MDL: Mean Detection Limit

** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-108 Whale Tail 2020 Quarry 1 QAQC

Parameter	Sample date		4/27/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters									
Total alkalinity, as CaCO3	mg CaCO3/L	2	3	3	-	79	75	5.19	-
Hardness	mg CaCO3/L	1	1	1	-	479	462	3.61	-
Carbonate (CO3)	mg CaCO3/L	2	2	2	-	2	2	0.00	-
Bicarbonate	mg CaCO3/L	2	3	3	-	79	75	5.19	-
TDS	mg/L	2	8	13	-	694	692	0.29	-
TSS	mg/L	1	3	2	1	5	4	**22.22**	**66.67**
Total organic carbon	mg/L	0.2	0.2	0.3	-	2.8	2.8	0.00	-
Dissolved organic carbon	mg/L	0.2	0.2	0.5	-	2.6	2.6	0.00	-
Major Ions									
Chloride	mg/L	0.5	0.5	0.5	0.5	206.7	209.4	1.30	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.028	0.027	3.64	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.02	0.12	0.12	0.00	0.00
Sulfate	mg/L	0.6	0.6	0.6	0.6	59.8	59.1	1.18	0.00
Nutrients and Chlorophyll a									
Ammoniacal Nitrogen as NH4	mg-N/L	0.01	0.01	0.01	-	1.65	1.66	0.60	-
Un-Ionized Ammonia, calculated	mg-N/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg-N/L	0.01	0.01	0.01	0.01	9.88	10.9	9.82	0.00
Nitrite	mg-N/L	0.01	0.01	0.01	-	0.07	0.07	0.00	-
Total nitrogen	mg/L	0.05	0.05	0.12	0.05	1.7	0.66	88.14	**82.35**
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
General Organics									
Total oil and grease	mg/L	1	1	1	1	1	1552	*199.74*	0.00
Total Metals									
Aluminum	mg/L	0.006	0.015	0.006	0.006	0.086	0.215	85.71	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	-	0.0022	0.0020	9.52	-
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.0166	0.0164	1.21	-
Barium	mg/L	0.0005	0.0005	0.0005	-	0.2748	0.2715	1.21	-
Beryllium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Boron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00002	0.00002	0.00	-
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0016	0.0019	17.14	-
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0046	0.0042	9.09	-
Iron	mg/L	0.01	0.01	0.01	-	0.15	0.15	0.00	-
Lead	mg/L	0.0003	0.0003	0.0003	-	0.0003	0.0003	0.00	-
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.5997	0.5566	7.45	-
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0215	0.0199	7.73	-
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0196	0.0180	8.51	-
Selenium	mg/L	0.001	0.001	0.001	-	0.002	0.001	**66.67**	-
Strontium	mg/L	0.005	0.005	0.005	-	0.582	0.537	8.04	-
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Tin	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Titanium	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Uranium	mg/L	0.001	0.001	0.001	-	0.011	0.010	9.52	-
Vanadium	mg/L	0.0005	0.0005	0.0005	-	0.0009	0.0010	10.53	-
Zinc	mg/L	0.001	0.002	0.001	-	0.005	0.004	**22.22**	-
Dissolved Metals									
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.006	0.006	0.00	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	-	0.0020	0.0021	4.88	-
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.0125	0.0130	3.92	-
Barium	mg/L	0.0005	0.0005	0.0005	-	0.2077	0.2280	9.32	-
Beryllium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Boron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00008	0.00004	**66.67**	-
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0006	0.0006	0.00	-
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0032	0.0040	**22.22**	-
Iron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Lead	mg/L	0.0003	0.0003	0.0003	-	0.0003	0.0003	0.00	-
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.4496	0.4935	9.31	-
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0160	0.0184	13.95	-
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0150	0.0159	5.83	-
Selenium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Strontium	mg/L	0.005	0.005	0.005	-	0.436	0.484	10.43	-
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Tin	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Titanium	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Uranium	mg/L	0.001	0.001	0.001	-	0.009	0.009	0.00	-
Vanadium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0006	18.18	-
Zinc	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
% Exceedance*								**3%**	**0%**

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-109 Whale Tail 2020 STP QAQC (ST-WT-11)

Parameter	Sample date		1/6/2020							2/24/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters																
Hardness	mg CaCO3/L	1	1	1	-	64	63	1.57	-	1	1	-	81	78	3.77	-
Total alkalinity, as CaCO3	mg CaCO3/L	5	13	13	-	97	11	*159.26*	-	30	30	12	95	93	2.13	**85.71**
TSS	mg/L	1	1	2	1	2	2	0.00	**66.67**	1	1	1	2	3	**40.00**	0.00
Major Ions																
Chloride	mg/L	0.5	0.5	0.5	0.5	89.7	90	0.33	0.00	0.5	0.5	0.5	90.3	88.8	1.68	0.00
Fluoride	mg/L	0.02	0.07	0.08	0.02	0.07	0.07	0.00	**120.00**	0.02	0.02	0.02	0.06	0.07	15.38	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	48.9	52.2	6.53	0.00	0.6	0.6	0.6	40.3	41.9	3.89	0.00
Nutrients and Chlorophyll a																
Ammoniacal Nitrogen as NH4	mg/L	0.01	0.01	0.01	-	0.17	0.13	26.67	-	0.01	0.01	-	0.33	0.34	2.99	-
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	-	0.01	0.01	0.00	-
Nitrate	mg/L	0.01	0.01	0.01	0.01	10.4	9.98	4.12	0.00	0.01	0.01	0.01	15.5	15.2	1.95	0.00
Nitrite	mg/L	0.01	0.01	0.01	-	0.24	0.24	0.00	-	0.01	0.01	-	0.03	0.03	0.00	-
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	5.49	5.26	4.28	0.00	0.01	0.01	0.01	6.62	7.01	5.72	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	5.32	5.42	1.86	0.00	0.01	0.01	0.01	6.48	6.07	6.53	0.00
General Organics																
Total oil and grease	mg/L	1	1	1	1	1	1	0.00	0.00	1	1	1	2	2	0.00	0.00
Total Metals																
Aluminum	mg/L	0.006	0.006	0.006	0.006	0.06	0.062	3.28	0.00	0.006	0.006	0.006	0.029	0.015	**63.64**	0.00
Arsenic	mg/L	0.0005	0.0009	0.0008	-	0.0044	0.004	9.52	-	0.0005	0.0005	-	0.0052	0.0045	14.43	-
Barium	mg/L	0.0005	0.0005	0.0005	-	0.0022	0.0022	0.00	-	0.0005	0.0005	-	0.0041	0.0028	**37.68**	-
Cadmium	mg/L	0.00002	0.00002	0.00002	-	0.00002	0.00002	0.00	-	0.00002	0.00002	-	0.00002	0.00002	0.00	-
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0008	0.0007	13.33	-	0.0006	0.0006	-	0.0006	0.002	**107.69**	-
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0066	0.0069	4.44	-	0.0005	0.0005	-	0.0068	0.0064	6.06	-
Iron	mg/L	0.01	0.05	0.04	-	0.06	0.05	18.18	-	0.01	0.01	-	0.03	0.03	0.00	-
Lead	mg/L	0.0003	0.0003	0.0003	-	0.0003	0.0003	0.00	-	0.0003	0.0003	-	0.0003	0.0003	0.00	-
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-	0.0005	0.0005	-	0.0024	0.0025	4.08	-
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00

Parameter	Sample date		1/6/2020							2/24/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0008	0.0008	0.00	-	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0055	0.0051	7.55	-	0.0005	0.0005	-	0.0077	0.007	9.52	-
Selenium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-	0.001	0.001	-	0.001	0.001	0.00	-
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.00
Titanium	mg/L	0.01	0.01	0.01	-	0.01	0.02	**66.67**	-	0.01	0.01	-	0.01	0.01	0.00	-
Zinc	mg/L	0.001	0.001	0.001	-	0.034	0.035	2.90	-	0.001	0.001	-	0.038	0.038	0.00	-
% Exceedance*								**3%**	**0%**						**0%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-110 Whale Tail 2020 Discharge to Whale Tail South via Permanent Diffuser QAQC (ST-WT-24b)

Parameter	Sample date		12/7/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Conventional Parameters									
Hardness	mg CaCO3/L	1	1	1	1	105	108	2.82	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	5	22	20	-	62	57	8.40	-
Carbonate	mg CaCO3/L	5	5	5	-	5	5	0.00	-
Bicarbonate	mg CaCO3/L	5	22	20	-	62	57	8.40	-
TSS	mg/L	1	1	1	1	4	3	**28.57**	0.00
Total organic carbon	mg/L	0.2	1.5	2	0.9	5	4.9	2.02	*75.86*
Dissolved organic carbon	mg/L	0.2	1.4	1.5	0.9	2.4	4.9	68.49	**50.00**
Major Ions									
Chloride	mg/L	0.05	0.5	0.5	0.5	33.4	33.7	0.89	0.00
Reactive Silica	mg/L	0.02	0.02	0.02	0.02	8.39	8.22	2.05	0.00
Sulphate	mg/L	0.6	0.6	0.6	0.6	22.8	22	3.57	0.00
Nutrients and Chlorophyll a									
Total ammonia as NH4	mg N/L	0.01	0.01	0.01	0.01	1.08	1.08	0.00	0.00
Un-Ionized Ammonia, calculated	mg NH3/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Nitrate	mg N/L	0.01	0.01	0.01	0.01	1.15	0.97	16.98	0.00
Nitrite	mg N/L	0.01	0.01	0.01	0.01	0.04	0.03	**28.57**	0.00
Nitrate + nitrite	mg N/L	0.01	0.01	0.01	0.01	1.19	1.01	16.36	0.00
Total nitrogen	mg N/L	0.05	0.09	0.05	0.05	1.2	1.4	15.38	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Dissolved phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.02	0.01	0.01	0.00	**66.67**
General Organics									
Total recoverable hydrocarbons	mg/L	0.1	0.1	0.1	0.1	0.2	0.2	0.00	0.00
Total Metals									
Aluminum	mg/L	0.005	0.005	0.005	0.006	0.005	0.005	0.00	-
Antimony	mg/L	0.0001	0.0001	0.0001	-	0.0001	0.0001	0.00	-
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.0014	0.0026	**60.00**	-
Barium	mg/L	0.0005	0.0013	0.0015	-	0.0653	0.0631	3.43	-
Beryllium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Boron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Cadmium	mg/L	0.00002	0.00002	0.00019	-	0.00006	0.00002	**100.00**	-
Chromium	mg/L	0.0006	0.0006	0.0006	-	0.0006	0.0006	0.00	-
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0035	0.0046	**27.16**	-
Iron	mg/L	0.01	0.01	0.01	-	0.07	0.07	0.00	-
Lead	mg/L	0.00017	0.00017	0.00017	-	0.00017	0.00017	0.00	-
Lithium	mg/L	0.005	0.005	0.005	-	0.005	0.005	0.00	-
Manganese	mg/L	0.0005	0.0005	0.0005	-	0.2986	0.3036	1.66	-
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0043	0.0042	2.35	-
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0032	0.0034	6.06	-
Selenium	mg/L	0.0005	0.0005	0.0014	-	0.0005	0.0005	0.00	-
Strontium	mg/L	0.005	0.005	0.005	-	0.202	0.205	1.47	-
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Tin	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Titanium	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Uranium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Vanadium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Zinc	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Dissolved Metals									
Aluminum	mg/L	0.005	0.005	0.005	0.006	0.005	0.005	0.00	18.18
Antimony	mg/L	0.0001	0.0001	0.0003	-	0.0004	0.0001	**120.00**	-
Arsenic	mg/L	0.0005	0.0005	0.0005	-	0.0014	0.0015	6.90	-

Parameter	Sample date		12/7/2020						
	Unit	MDL	Trip Blank	Field Blank	Lab Blank	Duplicate	Original	RPD (FD/N)	RPD (FB/LB)
Barium	mg/L	0.0005	0.0019	0.0021	-	0.0643	0.0618	3.97	-
Beryllium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Boron	mg/L	0.01	0.02	0.01	-	0.03	0.01	**100.00**	-
Cadmium	mg/L	0.00002	0.00002	0.00027	-	0.00002	0.00002	0.00	-
Chromium	mg/L	0.0006	0.0007	0.0008	-	0.0006	0.0006	0.00	-
Copper	mg/L	0.0005	0.0005	0.0005	-	0.0031	0.0031	0.00	-
Iron	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Lead	mg/L	0.00017	0.00017	0.00017	-	0.00017	0.00017	0.00	-
Lithium	mg/L	0.005	0.005	0.005	-	0.005	0.005	0.00	-
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	-	0.0048	0.0043	10.99	-
Nickel	mg/L	0.0005	0.0005	0.0005	-	0.0028	0.0028	0.00	-
Selenium	mg/L	0.0005	0.0005	0.0009	-	0.0008	0.0005	**46.15**	-
Strontium	mg/L	0.005	0.005	0.005	-	0.217	0.227	4.50	-
Thallium	mg/L	0.0002	0.0002	0.0002	-	0.0002	0.0002	0.00	-
Tin	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Titanium	mg/L	0.01	0.01	0.01	-	0.01	0.01	0.00	-
Uranium	mg/L	0.001	0.001	0.001	-	0.001	0.001	0.00	-
Vanadium	mg/L	0.0005	0.0005	0.0005	-	0.0005	0.0005	0.00	-
Zinc	mg/L	0.001	0.001	0.001	-	0.005	0.005	0.00	-
% Exceedance*								**1%**	**0%**

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

8.5.8 Seepage

8.5.8.1 *Meadowbank Site*

As required by NWB Water License 2AM-MEA1530 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-MEA1530 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 (Version 9) in Appendix 11.

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 2020 was estimated to be around 479 m^3/day. The measured flow is generally decreasing compared to values from the past years. Please refer to Section 8.5.3.1.3 for a discussion regarding East Dike Discharge to Second Portage Lake. This section discus the water quality monitoring results and compliance with MDMER and Water License.

Seepage channels at the toe of Bay-Goose Dike 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 predetermined locations to get an estimate of the seepage evolution. The flow in the channels is measured using a bucket and a stopwatch (averaging between 2.3 and 8.2 m^3/day in 2020). The reading frequency is approximately once per week during summer time.

8.5.8.1.2 Seepage 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. 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.

A series of pumping tests were also performed by Agnico during the summer of 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 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 2020 Central Dike seepage was pumped back into the South Cell, Pit E and Pit A. The average seepage rate at Central Dike is similar to 2019 with variations between 51 m^3/h in January 2020 and 203 m^3/hr in July 2020 and is following the trend from the 2017 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. Water in the South Cell is send to the pit when possible.

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 will continue until required in order to manage the water and ensure that the seepage water does 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 and 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 2020, some seepage along the wall face was noted along the south wall of Portage Pit E3. Seepage was observed along fracture planes exposed in the bench faces, particularly near the south end of the 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, any seepage is contributing to the re-flooding of the pits. There was no seepage observed in Pit A at the time of the inspection.

Water inflows and seepage were noted in two areas of the Vault Pit in 2020.

No major seepage inflows were observed in Phaser and BB Phaser pits.

The "2020 Annual Pit Slope Performance Review - Meadowbank Mine" provides more details regarding seepage at pit walls (Appendix 10).

8.5.8.1.6 Mill Seepage Meadowbank Site

On November 4th, 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 2020 Water Management Report and Plan (Appendix 11) 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 2020 in the interception trench and recovery well MW-203 because of frozen conditions. Table 8-111 below presents the volumes of water pumped back to the mill from the seepage from 2014 to 2020. A significant increase was observed in 2019 compared to previous years. This is mainly attributable to the significant higher volume of rainfall received in 2019, from June to September of 2019, there was approximately 2 times the amount of rainfall than recorded in previous years. Agnico is confident that the correctives measures implemented in previous year (refer to previous Annual Report for more information) are still effective and prevent potential contaminated water to reach any receiving environment.

Table 8-111 Meadowbank Assay Road Seepage pumped volume 2014-2020

Month	Pumped Volume (m^3)						
	2014	2015	2016	2017	2018	2019	2020
January	0	871	0	0	0	0	0
February	0	306	0	0	0	0	0
March	0	500	0	0	0	0	0
April	0	680	0	0	0	0	0
May	2,450	347	0	3,025	0	0	0
June	1,935	10,803	2,588	3,973	5,095	10,058	23,730
July	1,158	6,633	2,270	4,961	4,148	17,273	4,215
August	3,979	4,467	3,599	3,782	2,912	22,320	2,975
September	2,420	4,584	2,109	6,687	1,490	20,225	1,873
October	1,043	1,188	512	549	0	1,740	0
November	842	164	0	0	0	0	0
December	871	0	0	0	0	0	0
Total	**14,698**	**30,543**	**11,078**	**22,977**	**13,645**	**71,616**	**32,792**

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 20 below). At KivIA's request, additional monitoring was also conducted monthly during open water at TPL. Tables 8-112 and 8-113 contain monitoring results from the seepage and Third Portage Lake (TPL-Assay), respectively. It should be noted that well MW-04 and MW-08 were dry in 2020.

As per previous year, CN Free results in 2020 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. Monitoring will be continued in 2021 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 2021 in accordance with the 2021 Freshet Action Plan which includes requests made by KivIA in 2014 at the Water Licence renewal hearing.

Figure 20 Meadowbank General Layout of the Assay Road Seepage

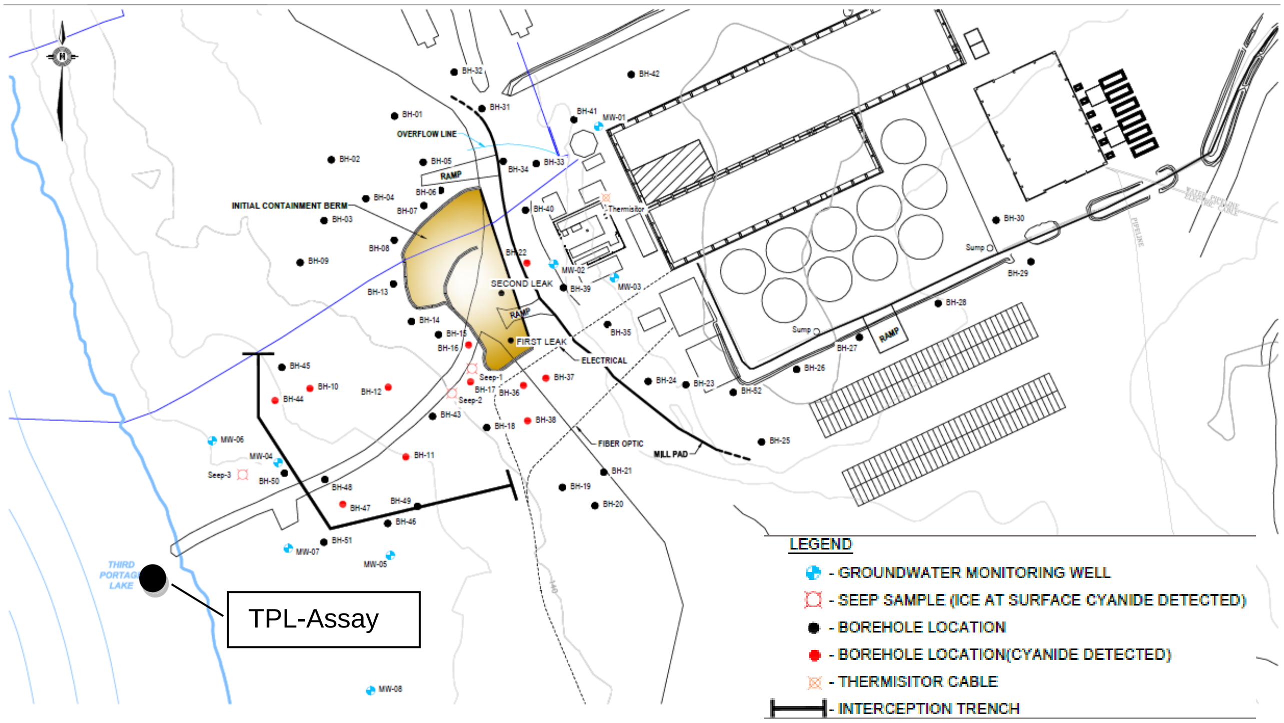


Table 8-112 Meadowbank Assay Road Seepage Trench and Well Water Quality Monitoring 2014-2020

Date	Mill Trench				MW-04				MW-05				MW-06				MW-07				MW-08			
	CN t (mg/L)	Free CN (mg/L)	Cu (mg/L)	Fe (mg/L)	CN t (mg/L)	Free CN (mg/L)	Cu (mg/L)	Fe (mg/L)	CN t (mg/L)	Free CN (mg/L)	Cu (mg/L)	Fe (mg/L)	CN t (mg/L)	Free CN (mg/L)	Cu (mg/L)	Fe (mg/L)	CN t (mg/L)	Free CN (mg/L)	Cu (mg/L)	Fe (mg/L)	CN t (mg/L)	Free CN (mg/L)	Cu (mg/L)	Fe (mg/L)
Regulatory guideline Water License	**1**	**NA**	**0.2**	**NA**	**1**	**NA**	**0.2**	**NA**	**1**	**NA**	**0.2**	**NA**	**1**	**NA**	**0.2**	**NA**	**1**	**NA**	**0.2**	**NA**	**1**	**NA**	**0.2**	**NA**
Regulatory guideline MDMER	**1**	**NA**	**0.6**	**NA**	**1**	**NA**	**0.6**	**NA**	**1**	**NA**	**0.6**	**NA**	**1**	**NA**	**0.6**	**NA**	**1**	**NA**	**0.6**	**NA**	**1**	**NA**	**0.6**	**NA**
Regulatory guideline CCME	**NA**	**0.005**	**0.002**	**0.3**	**NA**	**0.005**	**0.002**	**0.3**	**NA**	**0.005**	**0.002**	**0.3**	**NA**	**0.005**	**0.002**	**0.3**	**NA**	**0.005**	**0.002**	**0.3**	**NA**	**0.005**	**0.002**	**0.3**
2014																								
5/26/2014	0.087		0.01	1	Dry				Dry				Dry				Dry				Dry			
6/17/2014	0.44	0.061	0.057	1.6	Dry				Dry				Dry				0.069		0.14	2.2	0.024	<0.005	0.11	0.41
7/21/2014	0.38	0.020	0.031	1.6	Dry				Not enough water				Dry				Dry				<0.005	<0.01	0.014	0.43
8/19/2014	0.17	0.028	0.012	1.5	0.12		0.076	5.80	<0.005	<0.01	0.031	2.2	0.1		0.24	4.8	0.046	<0.02	0.1	9.4	<0.005	<0.01	0.055	6.40
9/29/2014	0.03		0.008	0.77													0.0013		0.134	10.9				
11/18/2014	Frozen				Frozen				Frozen				Frozen				Frozen				Frozen			
2015																								
7/29/2015	0.024		0.005	0.72	Dry				<0.005		0.13	1.49	Dry				Dry				<0.005		0.27	2.92
8/4/2015	0.038	<0.005	0.008	0.6	Dry				Dry				Dry				Dry				<0.005	<0.005	0.17	17.2
9/17/2015	0.030		0.005	0.2	Dry				Dry				Dry				0.008	<0.005	0.047	4.53	<0.005	<0.005	0.016	8.1
2016																								
8/8/2016	0.022	0.016	0.0254	0.3	Dry				Dry				Not enough water				<0.005	<0.005	0.2948	39.8	<0.005	<0.005	0.3709	62.8
8/16/2016	No sample taken				Dry				Dry				Not enough water				0.007		0.1811	27.8	<0.005		0.1142	19.8

9/6/2016		0.007			Dry				Dry				Dry					<0.005			Not enough water			
10/14/2016	Frozen				Dry				Dry				Dry					0.005			Dry			
2017																								
6/11/2017	0.057		0.0047	1.33	Dry				Dry				Dry				Frozen				Dry			
7/4/2017	No sample taken				Not enough water					<0.005			Dry					<0.005				<0.005		
7/9/2017	0.024	0.017	0.0042		Dry				Dry				Dry				<0.001				Dry			
7/14/2017	0.028	<0.005	0.0021		Dry								Dry				No sample taken				No sample taken			
7/18/2017	0.013	<0.005	0.003	0.36	Dry				<0.01	<0.005			Dry				0.002	<0.005	0.0668	23.8		<0.005	0.0258	10.5
7/28/2017	0.011	<0.005	0.0039		Dry				Dry				Dry				No sample taken				No sample taken			
8/22/2017	0.021	0.005	0.0026	0.61	Dry				Dry				Dry				0.013	<0.005	0.3535	161	Not enough water			
9/19/2017	0.005	0.005	0.0049	0.05	Dry				Dry				Dry				0.011	<0.005	0.1432	25.9	Dry			
2018																								
6/28/2018	Frozen				Frozen				Frozen				Frozen				Frozen				Frozen			
7/16/2018	0.016	0.014	0.0047	0.18	Dry				Dry				Dry				Equipment broken				Frozen			
8/20/2018	0.014	0.015	0.0052	0.08	Dry				Dry				Dry				Equipment broken				Dry			
9/17/2018	0.006	<0.005	0.0038	0.08	Dry				Dry				Dry				No sample taken				Dry			
9/24/2018	No sample taken				Dry				Dry				Dry				0.004	<0.005	0.0513	20.3	Dry			
2019																								
7/8/2019	0.044	0.013	0.0059	-	Dry				Dry				Dry				Dry				Dry			
7/9/2019	0.047	< 0.001	0.0045	0.04	Dry				Dry				Dry				Dry				Dry			
8/2/2019					Dry				< 0.001	< 0.001	0.0082	1.77	0.042	< 0.001	0.014	2.76	0.002	< 0.001	0.036	17.8	Not enough water			
8/17/2019	0.048	0.01	0.0043	0.03	Not enough water				Not enough water				Not enough water				Not enough water				Not enough water			
8/30/2019	0.008	0.002	0.0043	-	Not enough water				Not enough water				Not enough water				Not enough water				Dry			
9/6/2019	< 0.001	0.001	0.0032	-	Not enough water				Not enough water				Not enough water				Not enough water				Dry			
9/26/2019	0.025	0.011	0.0056	-	Dry				Dry				Dry				Dry				Dry			
2020																								
6/8/2020	0.038	0.01	0.0067	0.60	Dry				Dry				Dry				Dry				Dry			
7/7/2020	0.025	0.005	0.006	-	Dry				Dry				Dry				Dry				Dry			
7/14/2020	0.038	0.013	0.0061	-	Dry				Dry				Dry				Not enough water				Not enough water			
7/27/2020	0.022	0.012	0.0039	0.08	Dry				< 0.001	< 0.001	0.0076	5.8	Dry				Not enough water				Not enough water			

7/30/2020	0.022	0.017	0.0048	-	Dry	Dry	Dry	Not enough water				Not enough water
8/4/2020	0.01	0.009	0.0046	-	Dry	Dry	Dry	Not enough water				Not enough water
8/10/2020	0.016	0.01	0.0044	0.04	Dry	Dry	Dry	0.006	< 0.001	0.0257	11	Not enough water
8/18/2020	0.012	< 0.001	0.0039	-	Dry	Dry	Dry	Not enough water				Not enough water
8/25/2020	0.011	0.01	0.0047	-	Dry	Dry	Dry	Not enough water				Not enough water
9/1/2020	0.062	0.008	0.0045	-	Dry	Dry	Dry	Dry				Dry
9/22/2020	0.006	0.005	0.0033	-	Dry	Dry	Dry	Dry				Dry
9/29/2020	0.008	0.001	0.0043	0.14	Dry	Dry	Dry	Dry				Dry

Table 8-113 Meadowbank Assay Road Seepage 2020 TPL-Assay Water Quality Monitoring

Parameter	Sample Date	Annual Average						7/13/2020	8/10/2020	9/14/2020
	Unit	2015	2016	2017	2018	2019	2020			
Field Measured										
pH	pH units	7.7	7.4	7.6	7.4	7.4	7.9	7.67	8.32	7.7
Conductivity	uS/cm	93.1	94.0	104.3	105.1	86.2	98.9	109.6	92.5	94.7
Temperature	°C	11	16	15	8	11	11	11.1	17	4.5
Dissolved oxygen	mg/L	9.4	9.93	9.58	-	11.57	10.48	10.46	9.25	11.73
Turbidity	NTU	1.09	0.62	1.56	0.95	3.2	1.99	1.23	0.59	4.14
Conventional Parameters										
Hardness	mg CaCO3/L	30	37	34	33	36	51	61	42	51
Total alkalinity, as CaCO3	mg CaCO3/L	34	27	39	30	22	38	30	35	50
Total dissolved solids	mg/L	61	64	63	59	68	65	68	62	65
Total suspended solids	mg/L	1	1	2	1	2	3	1	1	8
Total organic carbon	mg/L	2.8	2.8	3.5	2.6	2.2	2.5	2.1	3.1	2.2
Dissolved organic carbon	mg/L	2.8	1.6	3.2	2.4	2.2	1.9	2.1	0.9	2.8
Colour	CU	1	3	2	1	1	5	< 1	1	12
Major Ions										
Bromide	mg/L	0.027	0.020	0.068	0.045	0.063	0.070	0.09	0.03	0.09
Chloride	mg/L	3.8	4.0	4.3	4.4	3.6	5.0	6.2	3.8	4.9
Cyanide	mg/L	0.005	0.004	0.004	0.001	0.013	0.001	< 0.001	< 0.001	< 0.001
Fluoride	mg/L	0.10	0.10	0.11	0.12	0.28	0.10	0.08	0.11	0.11
Sulphate	mg/L	16.4	16.2	12.2	12.2	15.5	15.6	17.9	13.9	15
Reactive silica	mg/L	-	0.4	0.5	0.3	0.5	0.8	1.2	0.57	0.59
Cyanide (free)	mg/L	0.005	0.005	0.005	0.005	0.001	0.001	< 0.001	0.002	< 0.001
Cyanide (WAD)	mg/L	0.005	0.003	0.003	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001
Thiocyanate	mg/L	0.05	0.0775	0.05	0.05	0.05	0.05	< 0.05	< 0.05	< 0.05
Nutrients and Chlorophyll a										
Nitrate	mg/L	0.04	0.02	0.02	0.01	0.07	0.01	< 0.01	< 0.01	< 0.01
Nitrite	mg/L	0.01	0.01	0.01	0.01	0.01	0.02	0.02	< 0.01	0.04
Total Kjeldhal Nitrogen	mg/L	1.12	0.22	0.61	0.16	0.30	0.16	0.18	0.22	0.09

Total phosphorus	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	< 0.04	< 0.01	< 0.01
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	0.01	0.07	0.18	< 0.01	< 0.01
Total ammonia as NH4	mg/L	0.01	0.01	0.04	0.01	0.02	0.02	< 0.05	< 0.01	0.01
Un-Ionized Ammonia, calculated	mg/L	0.01	0.03	0.05	0.02	0.01	0.01	< 0.01	< 0.01	< 0.01
Total Metals										
Aluminum	mg/L	0.006	0.006	0.006	0.017	0.013	0.022	< 0.006	< 0.006	0.054
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.004	0.001	0.001	0.001	0.001	0.0005	< 0.0005	< 0.0005	0.0006
Barium	mg/L	0.003	0.002	0.002	0.003	0.007	0.0050	0.0088	< 0.0005	0.0056
Beryllium	mg/L	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	0.00003	0.00002	0.00002	0.00002	0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.00163	0.00067	0.00068	0.0006	0.0006	0.0008	< 0.0006	0.0012	< 0.0006
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005
Copper	mg/L	0.0005	0.0006	0.0008	0.0006	0.0008	0.0006	< 0.0005	< 0.0005	0.0008
Iron	mg/L	0.01	0.01	0.01	0.01	0.05	0.13	0.06	0.05	0.29
Lead	mg/L	0.0003	0.0003	0.0026	0.0004	0.0003	0.0002	< 0.0003	< 0.00017	< 0.00017
Lithium	mg/L	0.005	0.005	0.005	0.005	0.005	0.005	< 0.005	< 0.005	< 0.005
Manganese	mg/L	0.0005	0.00137	0.0023	0.00065	0.00664	0.0118	0.0071	0.0064	0.0219
Mercury	mg/L	0.00001	0.00002	0.00001	0.00001	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.0009	0.0013	< 0.0005	0.001
Potassium	mg/L	0.001	1.120	1.230	1.090	1.230	1.75	2.08	1.38	1.78
Selenium	mg/L	0.001	0.001	0.001	0.0005	0.0005	0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	mg/kg	0.044	0.036	0.0535	0.0445	0.067	0.045	-	0.045	-
Thallium	mg/L	0.005	0.0008	0.0008	0.0002	0.0002	0.0002	< 0.0002	< 0.0002	< 0.0002
Tin	mg/kg	0.001	0.001	0.001	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001

8.5.8.2 *Whale Tail Site*

As required by NWB Water License 2AM-WTP1830 Schedule B, Item 13*: 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 was taking place in 2020. Lake water seepage was observed at Whale Tail Dike and is summarized in Section 8.5.8.2.2 below. No other lake water seepage was observed at the other dewatering dikes in 2020.

8.5.8.2.2 Seepage (of any kind) through Whale Tail Dike

The Whale Tail Dike was commissioned on March 5th, 2019 with the beginning of the dewatering activity of the North Basin.

In July 2019, seepage stream were observed on the downstream toe of Whale Tail Dike. The flow was measured using v-notch weirs at approximately 300 m^3/h which is higher than what was anticipated in the water balance. A detailed investigation including additional instrumentation and geophysics was conducted for a better understanding of the seepage phenomenon at the Whale Tail Dike.

A pumping system is being installed to collect and manage the non-contact seepage water. Construction is planned to be completed in 2021. The collected seepage water will be discharged to Whale Tail South Basin via a diffuser without treatment if the water quality meets the discharge criteria of the Water License 2AM-WTP1830. If discharge criteria are not met, water will overflow from the pump stations to the Whale Tail Attenuation Pond and mange as part of this infrastructure.

An intensive grouting campaign was conducted between Q4 2019 and Q1 2020 to further reduce the seepage flow. In 2020, average measured seepage flowrate decreased to less than 90 m^3/h.

Agnico Eagle continues to closely monitor the situation.

8.5.8.2.3 Seepage and runoff from the landfill

The Whale Tail Landfill was commissioned in October 2019. No seepage monitoring was observed reporting to this infrastructure in 2020.

8.5.8.2.4 Subsurface seepage and surface runoff from waste rock piles

As required by Part H, Item 8b of Water License 2AM-WTP1826, Agnico Eagle Mine Limited – Meadowbank Division ("Agnico") informed regulators via email on August 25th that during an inspection held on August 24th, 2019 at 10:30hrs of the Whale Tail Waste Rock Storage Facility (WRSF) Dike, a water flow was observed at the toe of the dike entering Mammoth Lake. Following observation of the water flow, special measures were immediately put in place on August 24th to reduce the flowrate by pumping water out of the WRSF collection pond, with the ultimate objective to stop the flow as quickly as possible. Given the nature of the topography at the toe of the WRSF Dike (flat terrain at an elevation close to the lake elevation with the presence of a boulder field), and its difficult access, installing a pumping station at the toe could not be done rapidly and that the best course of action was a rapid head reduction in the pond by emptying it.

The WRSF pond was considered to be essentially empty by September 1st 2019, within one week of the first observation. In the meantime, an access road to the toe of the dike was constructed to allow the installation of a water collection system to pump the water back upstream. The collection system was operated until the onset of freezing conditions on September 30th but after the pond was emptied. By this time it was mostly collecting drainage water downstream of the dike.

A series of measures were implemented to minimize the risk of a similar occurrence in the future:

- The water level in the WRSF pond was maintained at a low level throughout 2020 as per recommendation from the MDRB as a precautionary measure and to ensure protection of the freeze-back of the key trench and will continue in 2021;

- Permafrost penetration was promoted during winter 2019-2020 by implementing a series of additional measures to increase the robustness of the infrastructure and in particular the upstream toe against permafrost degradation:

    - Strategic snow removal to keep the toe more exposed to winter conditions;

    - Keeping a low water level (if any) in the pond during winter and summer months;

    - Placing additional thermal cover material on the upstream portion of the dike; and

    - Assessing freeze back performance with periodic instrumentation review;

- A downstream water collection system was constructed; and

- Thermistors monitoring will continue.

In addition, the following environmental monitoring was conducted in 2020:

- A monthly limnology profile of Mammoth Lake was completed over the winter and open water conditions;

- A core receiving environment monitoring program was carried out, including Mammoth lake; and

- A sediment sampling campaign was executed in the summer at Mammoth Lake.

Agnico Eagle completed all mitigation measures to ensure adequate performance of the structure.

The results of the 2020 environmental monitoring indicates that there were negligible effects from the WRSF pond seepage on the water quality and sediments in Mammoth Lake. This coincides with the conclusions from the 2019 Mammoth Lake Sediment Sampling Report completed by the KivIA in November 2019.

8.5.8.2.5 Seepage at pit wall and pit wall freeze/thaw and permafrost aggradation

In 2020, seepage was observed Whale Tail Pit along the south and west walls, along fault and foliation planes exposed in the bench faces. In 2020, 91,584 m^3 of water was pumped out of Whale Tail Pit to Quarry 1. Due to the pit's proximity to Whale Tail North and Quarry 1 it is expected that some of the water is from these locations, as well as snowmelt and rainfall. Release of water stored in the talik beneath the former lake has also been observed as the pit is excavated deeper. Instrumentation (piezometers and thermistors) has been installed in the south wall for monitoring.

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

No blast monitoring was conducted at the Meadowbank property in 2020 as mining operations ceased in 2019.

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 DFO Authorization 20HCAA-00275 Condition 2.3.8*: 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, DFO 16HCAA-00370 Condition 2.3.3 and DFO 20HCAA-00275 Condition 2.3.8, 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)

* TSM – Biodiversity and Conservation Management

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 has update the Blast Monitoring Program (Version 6, March 2021 – Appendix 40) to reflect the actual blast monitoring location on site. This Version 6 is submitted as part of the 2020 Annual Report.

The results of the 2020 blast monitoring program are available in the report entitled "2020 Meadowbank and Whale Tail Blast Monitoring Report for the Protection of Nearby Fish Habitat" attached as Appendix 41.

Peak particle velocity (PPV) and overpressure monitoring data was recorded throughout 2020 during blasting activities at Whale Tail and IVR Pits as well as during the construction of the Whale Tail South Channel. The locations of the blast monitoring stations on surface in 2020 at Whale Tail are highlighted in Figure 1 and 2 of the report Blast Monitoring Report found in Appendix 41.

In 2020, 24 blasts were monitored at IVR Pit. There were no PPV readings exceeding 13 mm/s and IPC measurements were all below the DFO limit of 50 kPa.

For Whale Tail Pit, 356 blasts were monitored. One (1) blast exceeded the PPV concentration DFO limit of 13 mm/s and no blast exceeded the IPC measurement DFO limit of 50 kPa.

During the construction of Whale Tail South Channel, three (3) PPV exceedances were recorded at a temporary blast monitoring station by Whale Tail South.

Table 8-114 presented a summary of PPV and IPC exceedance and Table 8-115 Maximum and Average PPV and IPC from 2018 - 20120.

Table 8-114 Whale Tail PPV and IPC exceedance from 2018-2020

Year	PPV exceedance	IPC exceedance
2018	2	0
2019	8	0
2020	4	0
Total	**14**	**0**

Table 8-115 Whale Tail Maximum and Average PPV from 2018 – 2020

Location	Parameters	2018	2019	2020
Whale Tail Pit	Max PPV (mm/s)	26.1	20.9	14.6
	Average PPV (mm/s)	4.5	2.16	0.98
	Max IPC (kPa)	30.54	24.46	17.09
	Average IPC (kPa)	5.01	2.23	1.19
IVR Pit	Max PPV (mm/s)	N/A	N/A	6.5
	Average PPV (mm/s)	N/A	N/A	0.67
	Max IPC (kPa)	N/A	N/A	7.59
	Average IPC (kPa)	N/A	N/A	0.81

A total of 4 PPV exceedances were recorded in 2020. All of them occurred during period of egg incubation (egg incubation period is from August 15 to June 30). One of these events were located at Whale Tail site and the other 3 were recorded during the construction of Whale Tail South Channel:

- The first exceedance was recorded at Mammoth Station for the 5116PSW60 with 14.6 mm/s in July 10th, 2020. For this blast, eight (8) preshear holes were detonated on the same delay. 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.

- The other exceedances were recorded at the Whale Tail South Channel construction site on January 27, February 5 and February 10. Agnico Eagle advised DFO following each events, in a delay of 72h, to detail the cause and mitigation measures put in place. All the exceedances were observed at the SWTC-2 station. The completed explanation are provided in Appendix A, B and C of the report entitled "2020 Meadowbank and Whale Tail Blast Monitoring Report for the Protection of Nearby Fish Habitat" attached as Appendix 41.

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 2020 groundwater monitoring program are available in Appendix 42. Below is a summary of the results and Agnico will refer to the report presented in the Appendix for a complete review and discussion of the results.

The 2020 groundwater monitoring program at Meadowbank was conducted in accordance with the Groundwater Monitoring Plan. Groundwater monitoring program is to be completed bi-annually, however it was only undertaken once in 2020 due to travel restrictions related to COVID-19. The objective of the 2020 groundwater monitoring program is to document groundwater and surface water quality for effects related to mining operations associated with the historic deposition of tailings in the tailings storage facility and current practices involving In-Pit Tailings Deposition.

The report (Appendix 42) includes a description of the surface water and groundwater sampling and a presentation of the water quality results.

In 2020, the groundwater monitoring program was completed by Golder personnel in September 2020 at the following five (5) monitoring well locations: MW16-01, MW-IPD-01(s), MW-IPD-01(d), MW-IPD-07, and MW-IPD-09 and at the Stormwater Management Facility. Seepage survey of the west walls of Pit-A and Pit-E was also conducted, and groundwater sampling was performed for Pit-E Seep (Pit-E Seep-27 m). Groundwater sampling from seepage observed on the west wall of Pit-A was not completed due to safety considerations.

Groundwater quality results were compared to the Portage effluent quality discharge limits stipulated in the Meadowbank water license, for comparative purposes only as there are no groundwater quality criteria applicable to the site. All groundwater samples collected in 2020 met these screening criteria, with the exception of total aluminum and TSS at MW-IPD-09. The SWMP sample collected by Golder in September 2020 met the screening criteria, with the exception of TSS.

In general, water quality was similar to results previously obtained, with a few exceptions. Concentrations of arsenic and chloride were higher than historic values at the Pit-E seepage monitoring location situated along the west wall of Portage Pit E, which may be related to mining operations involving the deposition of reclaim water effluent at the top of the west wall of Pit-E, based on observations of splashing of this water by wind during outflow into the pit. There remains uncertainty in the source of increased arsenic at the Pit-E wall seep sample, if and how it is related to mining activities.

The chemical signature of the groundwater at MW-16-01 continues to trend towards that of the reclaim water based on elevated concentrations of arsenic, copper, iron, and sulphate, while concentrations of chloride declined in 2020. The decreasing in concentrations of chloride observed at MW-16-01 since 2019 coincides with decreasing concentrations of chloride at reclaim water stations ST-21 South and ST-S-5. The groundwater quality at monitoring well MW-16-01 is interpreted to be affected by reclaim water from the South Cell TSF based on similar chemical signatures to reclaim water monitoring stations ST-21-South (South Cell TSF surface water) and ST-S-5 (Central Dike seepage). These monitoring locations are located hydrogeologically downgradient of the South Cell TSF and Central Dike. It is noted that the reclaim water signature at ST-21-South has declined since the deposition of tailings in the TSF was interrupted in 2019.

The groundwater quality in monitoring wells MW-IPD-01(d), MW-IPD-01(s), MW-IPD-07, MW-IPD-09 continues to display a natural water signature and can be used as background values against which to monitor groundwater quality in the future.

In-pit tailings deposition operations commenced at Meadowbank in July 2019 to accommodate the storage of tailings waste produced from Whale Tail Mine in addition to tailings produced at Meadowbank. Tailings deposition was discontinued in April 2019 in the South Cell TSF and July 2019 in the North Cell TSF. Tailings were deposited in Goose Pit from July 2019 to August 19, 2020 and commenced in Portage Pit-E (Pit-E) on August 20, 2020. Based on the results of the 2020 groundwater monitoring program, groundwater quality does not appear to be affected by in-pit deposition operations in the Goose Pit from July 2019 to August 2020 or Portage Pit-E since operations commenced in August 2020. The four IPD monitoring wells are located on the east side and hydraulically upgradient from the current IPD operations.

The groundwater monitoring program was initiated in 2003. A total of 14 groundwater monitoring wells were installed between 2003 to 2016 to characterize the groundwater within the five site areas: South and Central Dike, East Flat (East Dike area), Goose Pit, Portage Pit-A and Portage Pit-E. During this time, a total of 34 groundwater samples and 21 duplicates were collected from the monitoring network. The available historical groundwater monitoring program analytical results from 2003 to 2020 are discussed in Section 4.4 of the 2020 Groundwater Monitoring Report (Appendix 42).

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.

In Appendix 43, the 2020 Groundwater Management Monitoring Report presented a compilation of the site-specific data collection in 2020 and the review of 2020 monitoring data undertaken by Agnico to meet the requirements established in the Groundwater Monitoring Plan (Version 3_NWB, May 2019). The following is a summary of the report and Agnico will refer the reader to the whole report in Appendix 43 for an exhaustive comprehension of the program and results for 2020.

Groundwater sampling and hydraulic head measurements of the Westbay multi-level system (AMQ16-626) was undertaken in October 2020. A technical memorandum was prepared documenting the work and is presented as Attachment A of the complete report (Appendix 43).

The following presents a summary of the data contained in this document and how the data relate to relevant sections of the GWMP.

- Westbay Well AMQ16-626 was sampled in October 2020. The estimated groundwater quality at Ports 6, 4 and 3 are in the same range as estimated in 2016, thus no updates to the TDS profile from the deep bedrock groundwater are recommended at this time.

- Hydraulic head data collected at Westbay Well AMQ16-626 in 2020 indicated a local upward gradient was present between Ports 4 and 5, which is attributed to the dewatering of the North Basin. A downward hydraulic gradient is observed in the deeper ports, which indicates the South Basin is still recharging the deeper groundwater flow system.

- Data from IVR long TH 651A confirmed that horizontal groundwater flow below the active layer is restricted by permafrost in at least the upper 500 metres. Horizontal groundwater flow in the sub-permafrost is controlled by the relative hydraulic heads of lakes that are sufficiently large and deep to have an open talik beneath them (Whale Tail Lake and Nemo Lake). Thermistors near the TWD and south wall of Whale Tail Pit do not indicate freeze back has occurred since dewatering of the North Basin; however, continued monitoring is required to confirm temperature trends and possible freeze back in the future.

- Piezometric data near WTD, Whale Tail Attenuation Pond and the South Wall of Whale Tail Pit reflect the influences of dewatering of the North Basin and mining of the pit. Piezometer data shows some fluctuations in response to precipitation, blasting and fluctuations in the Whale Tail Attenuation Pond.

- Flow measurements recorded in October, November, and December (1,491 m^3/day to 1,869 m^3/day; average of 1,745 m^3/day) are the best estimate of groundwater inflow rates to the Whale Tail Pit since surface water inflows should be minimal and the influences of dewatering activities and storage changes will be diminishing. These inflow rates are higher than the annual average groundwater inflow rates estimated by the model for 2020/2021 (1,160 to 1,310 m^3/day), which suggests inflow measurements may be trending higher than predicted. Inflow measurements should continue to be monitored into 2021 to acquire and confirm six months of winter flow measurements. This information will be used to evaluate if the groundwater inflow data continues to trend over 20% higher than predicted. These data should be combined with a spring seepage survey, following any thawing in the pit walls, to evaluate the presence of preferential flow paths and if required, the groundwater model should be recalibrated, and updated groundwater inflow rates provided.

- TDS in the pit sump samples in October, November and December 2020 ranged from 15 mg/L to 412 mg/L, with an average concentration of 222 mg/L. Overall, the TDS data is variable. TDS trends will continue to be reviewed in 2021 and the parameter list will be expanded to allow direct TDS calculation from laboratory data. At this time there is insufficient data to directly compare TDS observations to model predicted values, given the complexity of mine activities occurring in 2020 and the uncertainty in water source contributions to the open pit. Like the groundwater inflow monitoring, TDS measurements should continue to be monitored into 2021 to acquire and confirm six months of winter flow measurements. This information will be used to evaluate if the groundwater inflow data (quantity and TDS quality) are trending higher than predicted. It is also recommended that the parameter list included in Section 4.2 of the GWMP be expanded to include all major cations (calcium and magnesium) and the full suite of dissolved metals contributing to TDS such that TDS can be directly calculated from the laboratory analysis.

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, until at least 2021. The last monitoring event occurred in 2019, and the complete report is provided in Appendix 40 of the 2019 Annual Report.

The next monitoring event will occur in 2021.

Once the minimum monitoring period as described in the HCMP (2017) is reached for each compensation feature (2021+), a weight-of-evidence approach incorporating all data collected to date will be used to determine whether specific criteria for success have been met.

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 20HCAA-00275 Condition 5.3.2: ***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 monitoring plans and complementary measures research projects of the Approved Project (PATH No.: 16-HCAA-00370) and adjust the Habitat Evaluation Procedure (HEP) model according to the results generated. The HSI will be used to refine, as necessary, the performance end-points in habitat units for offsetting***

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***

As required by NIRB Project Certificate No.008 Condition 24, Agnico has submitted the Fish Habitat Offsetting Plan (Appendix 51 of the 2018 Annual Report) in March 2018 (accepted by DFO through Fisheries Act Authorization 16-HCAA-00370 on July 23, 2018). This document incorporates the requested analysis of fish habitat gains from increased surface area in Whale Tail Lake and water quality modelling for Whale Tail Pit.

As described in 16HCAA-00370 Condition 5.2.1 and 20HCAA-00275 Condition 5.3.2, Agnico will work with DFO to develop a plan for monitoring to validate HSIs used in offsetting plans for the Whale Tail Pit and Expansion Projects. This plan will incorporate (where appropriate) additional knowledge from the complementary measures research projects.

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 20HCAA-00275 Condition 5.2.1: ***The Proponent shall provide a Whale Tail Expansion Fish Habitat Offset Monitoring Report to DFO including geotechnical and biological and ecological monitoring as per section 5.1.1. The Proponent is required to provide the Report by March 31 of 2027 and update annually for 10 years or until DFO indicates requirements of this Authorization have been met.***

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 20HCAA-00275 Condition 5.2.3: ***The Proponent shall provide a summary report of all Whale Tail Expansion Fish Habitat Offset Monitoring Reports described in section 5.2.1 before March 31, 2036 to DFO (and interested parties) which shall analyse results from the offsetting measures of the Whale Tail Expansion Project following the construction of the offsetting habitat. DFO reserves the right to request additional Summary Report if annual reporting were to continue until requirement has been met.***

And

As required by DFO Authorization 16HCAA-00370 Condition 5.1.1.5 and DFO Authorization 20HCAA-00275 Condition 5.2.2: ***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 Version 1 of the Whale Tail Fish Habitat Offset Monitoring Plan on March 2018 (Appendix 51 of the 2018 Annual Report) and having received no comment, resubmitted this plan to DFO on March 15th, 2019. This Plan was again referenced in the DFO-approved Fish Habitat Offsetting Plan for the Whale Tail Expansion Project (March 2020) and no modifications were received from DFO. Agnico will therefore proceed in conducting monitoring for the Whale Tail Pit offsetting (FAA 16-HCAA-00370) as described in Version 1 of the Plan unless otherwise discussed with DFO. Offset monitoring under Fisheries Act Authorization 20-HCAA-00275 (July 17th, 2020) is described in Section 8.2.2 of the Whale Tail Pit Expansion Project Fish Habitat Offsetting Plan (March, 2020). Monitoring activities under that plan were scheduled to begin following construction of the offsetting sill at Lake A18 (est. 2026). However, in fulfillment of Conditions 4.3.3, 5.1.1.2, and 5.3.1 of 20-HCAA-00275, Agnico will develop a pre-offsetting ecological monitoring program to assess the suitability of flooded areas in Whale Tail South as fish habitat, prior to construction of the A18 sill. This program will be based on the monitoring methods described in the approved Whale Tail Pit Expansion Project Fish Habitat Offsetting Plan (March, 2020), and formally initiated in 2021 (though it may make use of data collected in previous years). A final report will be provided to DFO by March 31st, 2024. This program will be conceptualized as an update to the FHOMP, and provided to DFO and interested parties for discussion.

The schedule for the implementation of the offsetting measures as per Condition 5.1.1.3 was submitted to DFO on January 7th, 2020 (Appendix 48 of the 2019 Annual Report).

According to DFO Authorization 16HCAA-00370 Condition 5.1.1.4 and the Fish Habitat Offset Monitoring Plan for Whale Tail Pit (March, 2018), Agnico is required to report on monitoring of the offsets for Whale Tail Pit following construction of the Mammoth sill and grid shoals (est. 2026). No monitoring was therefore required in 2020. However, a complete report on the progress of complementary measures (research programs) and the activities of the Meadowbank Fisheries research Advisory Group (MFRAG) is provided in the 2020 Fish Habitat Offset Monitoring Report (Appendix 44).

Briefly, six research studies are underway as complementary measures for Whale Tail Pit offsetting (Table 8-116). Due to field season delays in 2020 as a result of the COVID-19 pandemic, some study periods have been extended by one year. No final publications have yet been submitted (which will fulfill criteria for success) but two are planned to be complete in 2021.

Table 8-116 Whale Tail Pit Complementary Measures (research projects)

Study	Lead Researcher	Study Period
Study 1: Assessment of changes in aquatic productivity and fish populations due to flooding of Whale Tail South and downstream lakes during operations	H. Swanson	2018 – 2022**
Study 2: Assessment of impacts of the Baker Lake wastewater outflow on aquatic systems including fish and fish habitat	H. Swanson	2019 – 2026*
Study 3: Literature review and field validation of northern lake fish habitat preferences	S. Doka	2018 – 2021*
Study 4: Arctic Grayling occupancy modelling	H. Swanson	2018 – 2021
Study 5: End pit lake habitat use	TBD	2027 – 2035 (est.)
Study 6: eDNA methods development	J. Stetefeld	2018 - 2023

*Extended 1 year due to COVID delays (new dates shown).

**May be extended 1 year

As part of the Fish Habitat Offsetting Plan for Whale Tail Pit (March, 2018), the Meadowbank Fisheries Research Advisory Group (MFRAG) was conceptualized to provide a forum for input from key stakeholders. The MFRAG meets annually to review project progress reports, propose and approve or reject new projects or project components, and assess whether criteria for success have been met. Refer to Section 8.9 below for a discussion about the MFRAG

The participant list, agenda, and notes from the 2020 MFRAG meeting are provided in Appendix A of the 2020 Fish Habitat Offset Monitoring Report (Appendix 44).

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 year of constructed habitat offset monitoring.

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***

And

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***

In compliance with DFO Authorization 16HCAA-00370 Condition 4.2.1.2, updated research plans for these studies have been provided in the 2018 and 2019 Annual Progress Reports on Complementary Measures, which are provided to DFO by May 30 annually (in compliance with Condition 4.2.1.5 of the Authorization).

A summary of the research plans and details on the progress of each study listed under Condition 4.2.2.1a-e is provided in the 2020 Fish Habitat Offset Monitoring Report (Appendix 44), including progress towards publication in peer-reviewed scientific journals.

As per Condition 4.2.1.3, the requested literature review and preliminary study outline was provided to DFO by email on March 15th, 2019 (Appendix 42 of the 2018 Annual Report). More details regarding this study can be found in the 2020 Fish Habitat Offset Monitoring Report in Appendix 44.

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.***

As described above in Section 8.8.2.2, the Meadowbank Fisheries Research Advisory Group (MFRAG) was conceptualized to provide a forum for input from key stakeholders on complementary measures (research programs) conducted under the Fish Habitat Offsetting Plan for Whale Tail Pit (March, 2018). The MFRAG meets annually to review project progress reports, propose and approve or reject new projects or project components, and assess whether criteria for success have been met.

In 2019, Agnico Eagle confirmed interest in MFRAG participation by DFO, the Kivalliq Inuit Association (KivIA), and the Baker Lake Hunters and Trappers Organization. As planned in the Fish Habitat Offsetting Plan for Whale Tail Pit, Appendix C (May, 2018), Agnico also identified a third party external advisor (Dr. Kelly Munkittrick, University of Calgary) who will participate in all MFRAG activities. A draft Memorandum of Understanding and Terms of Reference (TOR) were developed by Agnico, and reviewed by all parties. The initial meeting of the MFRAG was held on December 12th, 2019 in Montreal, Quebec. Representatives from all member groups were in attendance. The group received presentations by lead researchers involved in each study, and had the opportunity for questions, comments, and open discussion. Each MFRAG member group was requested to provide written comments, if any, by February 28th, 2020. Written comments were distributed to research study leads for consideration.

In 2020, the MFRAG TOR were finalized, and have been signed by all parties as of March, 2021. The second annual meeting of the MFRAG was held by video conference on December 2nd, 2020, with all member groups participating (Agnico, DFO, KivIA, BLHTO). As in 2019, the group received presentations by lead researchers involved in each study, and had the opportunity for questions, comments, and open discussion. Each MFRAG member group was requested to provide written comments, if any, by January 13th, 2021. Written comments were again distributed to all member groups and the research study leads for consideration. No major concerns with research study progress were raised during the meeting or in follow-up comments.

The participant list, agenda, and notes from the 2020 MFRAG meeting are provided in Appendix A of the 2020 Fish Habitat Offset Monitoring Report (Appendix 44).

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;

As part of the FEIS Addendum for the Whale Tail Expansion Project (Agnico Eagle, 2018; Section 6.5), supplemental analyses were conducted to understand impacts of Project-relate changes to water quality in Mammoth Lake (and downstream lakes). It was determined that anticipated increases in phosphorus would increase the lower trophic food base for fish, potentially resulting in numerical increases in forage fish such as Slimy Sculpin, and a minor increase in growth and reproduction rates for large-bodied fish such as Lake Trout and Arctic Char. However, any observed effects are expected to be reversible during late closure or post-closure, and the stability of the fish population is no expected to be compromised. Agnico is committed to monitoring and verify the phosphorus predictions through ongoing testing conducted as part of the Water Quality and Flow Monitoring Program and the CREMP.

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) are being investigated through regular compliance monitoring programs (Water Quality and Flow Monitoring Program and the CREMP), as well as an onsite aquatic productivity study conducted by University of Waterloo (UW) researchers in partnership with Agnico. A research agreement for this project was signed in late 2018, and details of the study plan were provided in Section 8.8.2.4.1 of the 2018 Annual Report. Annual updates are provided to DFO (May 31st annually). Baseline analyses were completed in 2018, and included small-bodied fish sampling (shoreline electrofishing), and water chemistry sampling in Whale Tail Lake flood zone, Mammoth Lake and downstream lakes. Follow-up surveys continued in 2019 and 2020 during flooding. This study will be ongoing until 2022 at this time. A complete project update is provided in the Fish Habitat Offset Monitoring Report (Appendix 44).

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 – see Appendix 33.

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.***

The fish-out programs for Second Portage Lake, Third Portage Lake, Vault Lake, and Phaser Lake were completed and reported between 2008 and 2016.

8.11.2 Whale Tail Site

As required by DFO Authorization 16HCAA-00370 Condition 2.4 and 20HCAA-00275 Clause 2.3.7: ***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***

Under DFO Authorization 16HCAA-00370, the fish-out of the North Basin of Whale Tail Lake occurred in 2018 in accordance with the conditions described above, and complete results were reported in the 2018 Annual Report.

The fish-out of waterbodies in the Whale Tail Project area under DFO Authorization 20HCAA-00275 was complete in 2020 in communication with DFO. Results are reported in Appendix 45 (Whale Tail Pit Expansion Project Fish-out Report). Briefly, fish-outs were carried out in 10 waterbodies (Table 8-117). For most waterbodies, there was a Methods Trial Phase of up to 3 days, a Catch Per Unit Effort (CPUE) Phase, and a Final Removal Phase. Because of the short open-water season and number of waterbodies, multiple gear types were used simultaneously during each phase. Gear types included minnow traps, beach seining, backpack electrofishing, hoop nets and gill nets.

For each waterbody and gear type, daily reports of total catch, effort, and CPUE were communicated with DFO, who advised on fish-out phase transition and termination. In all cases, fish-outs were determined to be complete on the advice of DFO. With all effort combined, between 0 and 17,682 fish consisting of up to five species (ninespine stickleback, slimy sculpin, Arctic char, burbot, and lake trout) were captured from each of the nine waterbodies (Table 8-117). In total, four waterbodies were fish-less, four had populations of only ninespine stickleback, and two contained both small- and large-bodied species.

All attempts were made to transfer salvaged fish to Whale Tail Lake South, and the successful live transfer rate for the CPUE Phase and Final Removal Phase combined was 70 – 97% for each waterbody.

Table 8-117 Total abundance and biomass by species and waterbody for the 2020 Whale Tail Expansion Project Fish-out

Waterbody	Species	Biomass		Abundance	
		g	%	#	%
A0	NNST	300	100%	1,050	100%
A-P38	-	0	-	0	-
A46	NNST	562	100%	837	100%
A47	NNST	2,361	100%	4,045	100%
A48	NNST	4,299	100%	17,682	100%
A49	LKTR	6,250	96%	13	7%
	SLSC	279	4%	183	93%
	Total	6,529	100%	196	100%
A50	-	0	-	0	-
A51	-	0	-	0	-
A52	Waterbody dry. No fish present.				
A53	NNST	3,216	6%	2,709	96%
	SLSC	125	0%	40	1%
	BURB	3,808	7%	23	1%
	ARCH	17,271	31%	29	1%
	LKTR	31,310	56%	20	1%
	Total	55,731	100%	2,821	100%

NNST = ninespine stickleback, LKTR = lake trout, SLSC = slimy sculpin, BURB = burbot, ARCH = Arctic char.

Length and weight were recorded for nearly all fish captured. Gender, maturity and/or reproductive status and a detailed biological assessment (some or all of stomach weights, gonad weights, liver weights, fecundity assessment, examination of DELTS) were also assessed for a subset that did not survive capture or transfer (29 fish). Muscle tissue samples and aging structures (otoliths) were also collected and stored.

Initial population estimates were made using all available data at the completion of the fish-out program. Using the Leslie and DeLury methods (Ricker, 1975), total population estimates summed across gear types for each waterbody ranged from 9 – 137% of total fish captured, with an average of 53%. Of the 12 total population estimates (Leslie and DeLury methods for the six fish-bearing waterbodies), only two were overpredictions while the rest underpredicted the initial population size, based on total catch.

Overall, the objectives of Whale Tail Pit Expansion Project Fish-out were met where feasible, including:

- to conduct a CPUE phase incorporating multiple simultaneous fishing methods;
- to expedite fish salvage in the affected waterbodies;
- to collect and report CPUE data that can be used to identify when the pre-determined fish-out endpoint is met (i.e., when fishing should stop).

It was Agnico's full intent to fulfill the final objective ("to engage the local community by including them in the fish-out process where appropriate and on fish relocation/disposal") through consultation, hiring of local field assistants, and distribution of fish to the community. However, restrictions on community contact under the COVID-19 pandemic limited engagement activities to a pre-fishout consultation with the BLHTO (June 26th, 2020). Results of the fish-out program will also be provided to the Hamlet in a plain language format for public review.

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), 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 the current NWB Type A Water License 2AM-MEA1530 (Meadowbank site) and NWB Water License 2AM-WTP1830 (Whale Tail site) requirements. The scope of the original 2005 AEMP has been renamed the Core Receiving Environment Monitoring Program (CREMP). The AEMP was updated in 2020 (Version 4) to include eventual tailings pore water analysis.

This 2020 AEMP synthesis report aims to fulfill the following objectives for each of 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 commonly 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 8-118 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 2020, all of the potential pathways, exposure media and receptors of concern listed in Table 8-118 were relevant to the AEMP analysis and were evaluated. The 2020 AEMP evaluation is provided for the Meadowbank site in Section 8.12.3, and for the Whale Tail site in Section 8.12.4.

Table 8-118. 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	MDMER 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.

8.12.3 Meadowbank Site AEMP

As required by NWB Water License 2AM-MEA1530 Schedule B, Item 16: ***The results of monitoring under the AEMP.***

8.12.3.1 *Summary of Results of AEMP- Related Monitoring Programs*

In 2020, AEMP-related monitoring programs for the Meadowbank site (excluding Whale Tail, which is assessed in Section 8.12.4) consisted of:

- Core Receiving Environment Monitoring Program (CREMP);
- Groundwater Monitoring;
- Metal and Diamond Mining Effluent Regulation (MDMER) Monitoring;
- EEM Biological Monitoring;
- Minesite Water Quality and Flow Monitoring;
- Visual AWAR and Quarries Water Quality Monitoring;
- Blast Monitoring; and
- 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 2020 for the Meadowbank site include lake dewatering monitoring, dike construction monitoring, habitat compensation monitoring, blast monitoring, and fish-out studies. Air quality monitoring, 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 throughout this Annual Report, and referenced below, with additional details relevant to the AEMP, as necessary. Table 8-119 further summarizes the results of these programs in 2020 for the Meadowbank site. For detailed results of individual monitoring programs, refer to the appended reports, as referenced below. At an individual level, none of the trigger or guideline exceedances observed through these programs were assessed as having the potential to cause significant risks to the aquatic receiving environment requiring immediate changes in management actions.

Table 8-119 Summary of aquatic effect monitoring program results for the Meadowbank site in 2020

	Core Receiving Environment Monitoring Program	Effects Assessment Studies	Dike Construction Monitoring	Habitat Compensation Monitoring	Dewatering Monitoring	MDMER Monitoring	EEM Biological Monitoring	Water Quality and Flow Monitoring	Fish-Out Studies	Visual AWAR and Quarry Water Quality Montoring	Blast Monitoring	Groundwater Monitoring
Completed in 2020?	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**No***	**Yes**	**No**	**Yes**	**No**	**Yes**
Stressor Variables												
suspended solids	○					○		●		○		●
sediment deposition	NA					NA		NA		○		NA
water-borne toxicants	●					○		NA		NA		●
sediment toxicants	●					NA		NA		NA		NA
nutrients	○					NA		NA		NA		NA
other physical stressors	○					NA		NA		NA		NA
Effects Variables												
Phytoplankton	○					NA		NA		NA		NA
Zooplankton	NA					●		NA		NA		NA
Fish	NA					●		NA		NA		NA
Benthic invertebrate community	○					NA		NA		NA		NA
Periphyton	NA					NA		NA		NA		NA
Fish habitat	NA					NA		NA		NA		NA

Notes:

*The field program was conducted in 2020 but results are not provided until July, 2021.

○ 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

The Core Receiving Environment Monitoring Program report for 2020 is provided in Appendix 33, and additionally summarized in Section 8.1. Highlights in the AEMP context are provided below. A spatial and temporal trend assessment for parameters exceeding trigger values is provided in Table 8-120.

Briefly, no new mine-related changes were recorded in 2020. Similar to previous years, the before-after-control-impact (BACI) analyses identified statistically significant mine-related changes relative to baseline/reference conditions at one or more near-field areas for conductivity, hardness, total dissolved solids, alkalinity, and major cations (i.e., calcium and magnesium). 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 changes to water quality are mine-related, 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.

Similarly, although some changes in phytoplankton and benthic invertebrate communities were observed, there is no indication that mining operations are systematically affecting these parameters.

Results of sediment analyses indicate that previously-observed mine-related impacts (chromium in Third Portage East) have stabilized and do not currently pose a risk to benthic invertebrates.

Table 8-120 Summary of 2020 CREMP results for the Meadowbank site (Appendix 33): 2020 CREMP Report, Table ES-1).

Notes
1. Temporal and spatial trends are outlined for Monitoring Components and Variables that exceeded trigger or thresholds (i.e., apparent change from baseline)
2. Spatial scale ratings are: localized = small area within the lake/area; wide-spread = basin to whole lake
3. Causality ratings are: low = no evidence of a mine-related source; moderate = some likelihood of a mine-related source; high = the source of the change is likely mine-related.

Variable	Summary	Temporal and Spatial Trend Assessment[1, 2, 3]
Limnology Section		
Oxygen and Temperature	The limnology profiles collected in 2020 indicated 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	The observations of minor stratification in early year monitoring events followed the pattern from previous years of being well mixed and unstratified by July.	The spatial and temporal trends appear to be consistent with previous years.
Water Chemistry Section		
Conventional Parameters and Major Ions	Conductivity, hardness, TDS, alkalinity, and major cations exceeded their trigger values at one or more NF areas in 2020. These results are consistent with recent years. The trigger value 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 2020 are similar to 2019, 2018, 2017, etc.) **Causality – high**; the spatial pattern and temporal trend of increasing concentrations in the *after* period is plausibly attributed to activities at the mine.
Nutrients	A minor trigger exceedance of reactive silica at WAL, otherwise most nutrients' concentrations = baseline.	**Spatial scale – localized**; reactive silica is only elevated at WAL. **Temporal trend – none**. **Causality – low**; no evidence of mine-related source.
Metals	The yearly mean for total and dissolved silicon exceeded the trigger value at SP. There are no *before* data to use in the BACI statistical analysis of changes over time for silicon, but concentrations appear stable throughout the monitoring period. The yearly mean for dissolved zinc exceeded the trigger value at TPN, TPE and SP. There are no *before* data to use in the BACI statistical analysis of changes over time for dissolved zinc in TPN and SP. The yearly mean at TPE showed a statistical increase in dissolved zinc. All other metals concentrations (total and dissolved) were consistently low or below their respective MDLs at the NF, MF, and FF locations in 2020.	**(1.) Spatial scale – localized (Si)**; silicon is elevated at SP only. **Temporal trend – stable (Si)**; 2020 silicon concentrations appear to be unchanged over all sample years in SP since 2011 **Causality – low (Si)**; the long-term stability and the monthly stability in 2020 of silicon concentrations in SP suggest conditions are not mine related. **(2.) Spatial scale – widespread/uncertain (d-Zn)**; dissolved zinc is elevated at TPN, TPE, SP but within-lake variability is high, leading to high uncertainty. **Temporal trend – sporadic/uncertain (d-Zn)**; dissolved zinc concentrations have sporadically exceeded the trigger in previous years with no apparent consistency. **Causality – low (d-Zn)**; the results for dissolved zinc are not supported by spatial and temporal trends, or linked to mining activities. The results were not relied on in the sampling effort and frequency assessment.
Phytoplankton Section		
Chlorophyll-a	There is no trigger for chlorophyll-a for the CREMP. For reference and NF areas (not WAL), chlorophyll-a concentrations peaked in May in 2020.	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.

Variable	Summary	Temporal and Spatial Trend Assessment[1, 2, 3]
Total Biomass	Decreases in phytoplankton biomass were detected at NF areas in 2020 relative to baseline/reference conditions but was not confirmed by the time-series plots. The magnitude of the BACI analysis decrease ranged up to 26% at TPE. There were no statistically significant changes. Nutrient concentrations (i.e., nitrogen and phosphorus) were similar to baseline.	**Spatial scale – widespread**; phytoplankton biomass was reduced in the BACI analysis at all NF areas relative to baseline/reference conditions in 2020. **Temporal trend – stable**; historical biomass for the NF areas do not show obvious visual signs of temporal decreases for individual NF study areas. **Causality – low**; SP was the only NF area that received effluent discharge in 2020. The magnitude of the change in biomass at the other NF areas suggests the observed pattern of decrease in phytoplankton biomass is likely annual variability in the community rather than mine-related.
Taxa Richness	A statistically significant increase (17%; p=0.086) in taxa richness was noted at TPN in 2020 relative to baseline/reference conditions; however, this is below the 20% trigger level.	**Spatial scale – localized**; increased taxa richness relative to reference/baseline conditions was only evident at TPN. **Temporal trend – stable**; richness has remained stable during the *after* period. The apparent increased richness at TPN in 2020 relative to baseline/reference conditions is likely an artefact of natural fluctuation in the community composition rather than an increase. **Causality – low**; there is no indication that mine activities are influencing taxa richness.
Sediment Chemistry Section		
Metals	Core samples for sediment chemistry were collected at TPE, TPN, SP, WAL, INUG, and PDL in 2020 as part of the coring cycle (i.e., every 3 years with EEM). The results were compared to triggers/thresholds. Parameters with mean concentrations exceeding the trigger value were formally tested using a before-after (BA) statistical model to assess whether concentrations are increasing over time. The mean sediment concentrations exceeded the trigger for arsenic at WAL, for chromium at TPE, and for zinc at SP and TPE. These increases were all statistically significant except for zinc at TPE. Grab samples were collected alongside benthic invertebrate samples and analysed for grain size to support interpretation of benthos results.	**(1.) Spatial scale – localized (As)**; arsenic is elevated at WAL only. **Temporal trend – stable (As)**; 2020 arsenic concentrations at WAL appear to be similar to previous years and decreasing since 2017. **Causality – low (As)**; there are no trends in sediment arsenic at WAL attributable to activities at the mine. **(2.) Spatial scale – localized (Cr)**; chromium is elevated at TPE only. **Temporal trend– stable (Cr)**; Chromium concentrations at TPE consistently trended higher from 2009-2013 (i.e., onset of the mine development). The pattern since 2013 has been variable. Chromium concentrations were lower in 2018 (150 mg/kg) compared to 2017 (205 mg/kg), higher again in 2019 (190 mg/kg), followed by a decrease in 2020 (163 mg/kg), demonstrating that concentrations are not likely increasing year-over-year. **Causality – high (Cr)**; increasing concentrations of chromium in sediment at TPE were likely related to use of ultramafic rock for dike construction. **(3.) Spatial scale – widespread (Zn)**; zinc is elevated at SP and TPE. **Temporal trend – stable (Zn)**; while there was an apparent increasing trend in zinc at both SP and TPE over the last few years, the 2020 concentrations remain within the range of baseline zinc concentrations and have decreased notably from 2019. **Causality – low (Zn)**; it appears that the observed patterns of sediment zinc at SP and TPE are due to natural spatial heterogeneity.
Hydrocarbons	Grab samples were collected at TPE, TPN, SP, WAL, INUG, and PDL and analysed for organics. Sediment hydrocarbon concentrations were below detection for all NF area grab samples in 2020.	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		

Variable	Summary	Temporal and Spatial Trend Assessment[1, 2, 3]
Total Abundance	Benthic invertebrate communities at the NF areas were monitored in 2020. Decreased abundance at TPE relative to INUG in the past four years relative to reference/baseline conditions. Statistically significant differences were noted for the 4-year after period (2017-2020). The apparent trend does not appear to be supported in the time-series plots. 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 shows stable or improving results over the last seven years and consistent with the range observed in baseline. Absolute total abundance at TPE in 2020 (~3,200 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.
Total Richness	No changes observed in taxa richness in 2020 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 Habitat Compensation Monitoring

In 2020, the HCMP was not required to be conducted. The next monitoring event will occur in 2021.

8.12.3.1.3 Meadowbank Dike Construction and Dewatering Monitoring

No dike construction or dewatering occurred in 2020.

8.12.3.1.4 Meadowbank Groundwater Monitoring

The complete 2020 Groundwater Monitoring Report is provided in Appendix 42, and a summary of the 2020 program for the Meadowbank site is provided in Section 8.7.1.

Briefly, a total of five monitoring wells were operable at the Meadowbank site in 2020, in addition to the pumping well at the East Dike location. Monitoring wells were sampled by Golder (September, 2020) with the addition of one pit wall seepage location and the Stormwater Management Pond. Locations are shown in Appendix 42. Agnico additionally sampled East Dike seepage discharge, Central Dike seepage, in-pit reclaim water, and historic TSF reclaim water. These results were used to assess the potential effects of reclaim water on the groundwater quality at the existing monitoring stations.

Groundwater monitoring data is compared to Third Portage Effluent Discharge Limits (maximum average concentration; MAC) from the NWB Water License 2AM-MEA1530 for illustrative purposes only, since these regulated parameters apply to effluent, not site contact water or groundwater quality.

The 2020 results were generally consistent with historical data. Exceptions include the Pit-E wall seep, where increased concentrations of arsenic and chloride were observed. This may be related to mining operations involving the deposition of reclaim water effluent at the top of the west wall of Pit-E, based on observations of splashing of this water by wind during outflow into the pit. The chemical signature at MW-16-01 continue to trend towards that of reclaim water based on elevated concentrations of arsenic, copper, iron, and sulphate. This location is interpreted to be affected by reclaim water from the South Cell TSF.

All parameter concentrations met the MAC effluent criteria with the exception of TSS (MW-IPD-01(d) and Stormwater Management Pond) and total aluminum (MW-IPD-01(d)). However these parameters are not specifically associated with the chemical signature of site reclaim water. The exceedance for total aluminum was marginal (single sample result of 1.62 mg/L, with a limit for average concentration in discharge of 1.5 mg/L). Elevated TSS has occurred in previous years (2019), likely as result of well purging action. Groundwater quality at the four additional monitoring wells continues to display a natural water signature.

Groundwater quality does not appear to be affected by in-pit deposition operations.

8.12.3.1.5 Meadowbank Site Non-Contact Water and Effluent Monitoring

This section includes discussion of results from water quality monitoring under MDMER (and its Schedule 5, Environmental Effects Monitoring) and Agnico's Water Quality and Flow Monitoring Plan for managed non-contact water, seepage to the receiving environment, or any water discharged to the receiving environment. Complete results are provided in Section 8.3.1 and Section 8.5, and highlights are summarized here.

8.12.3.1.5.1 Effluent Discharge

In 2020, only East Dike seepage water was discharged to the receiving environment at the Meadowbank site (Second Portage Lake) as non-contact water. When TSS results began trending up in June, Agnico diverted discharge to the pits, as has been done in past years. There was no exceedances of the TSS MDMER criteria or NWB Water License limits for water released to the receiving environment in 2020.

As the only effluent discharge point, Agnico was required to collect EEM effluent characterization samples for this station. Effluent characterization with sub-lethal toxicity tests were conducted on three occasions (January, April, October) and results were reported to Environment & Climate Change Canada via the MERS electronic database reporting system. Either sub-lethal effects and/or acute lethality was reported for at least one organism in all three tests with 100% effluent. The full interpretive report evaluating these results along with biological monitoring data is due in July, 2021.

8.12.3.1.5.2 Minesite Water Collection System

Mine site water collection system monitoring locations with discharge to the receiving environment consisted of the East and West diversion ditches. These ditches were constructed on the north side of the minesite to intercept overland flow and direct it (as non-contact water) to NP-2 Lake and Third Portage Lake, respectively.

For these locations, single samples are collected monthly during open water (June – October) for analysis by an accredited laboratory and compared to NWB Water License criteria for the monthly mean for TSS (15 mg/L). Daily TSS analyses are also performed by the onsite assay laboratory for management purposes.

In 2020, June compliance samples for both locations exceeded the mean NWB license limits for TSS, at 17 and 26 mg/L. However, internal TSS analyses performed daily at the onsite assay lab during June showed TSS levels remained below 5 mg/L for most of the month, indicating that if multiple samples were collected for compliance purposes, it is unlikely the monthly mean limit would have been exceeded.

8.12.3.1.5.3 Seepage

Waste Rock Storage Facility Seepage

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 Lake). The KivIA requested that Agnico continue monitoring until there is a 5 year period of non-detect cyanide results. The 2014 – 2018 results confirmed no impacts to downstream lakes (NP-1, Dogleg, Second Portage Lake), however, in response to ECCC's comment on the 2018 Annual Report, Agnico will continue to monitoring water quality in NP-2 on a yearly basis.

In 2020, CN concentrations in NP-2 were again below detection limits.

Mill Seepage

Monitoring in Third Portage Lake in response to the mill seepage through the Assay Lab 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).

Pumping is conducted using a recovery well in the interception trench, as required, and sampling is completed for adjacent monitoring wells and a designated near-shore monitoring station in Third Portage Lake.

In 2020, as in previous years, concentrations at the designated monitoring station in TPL were all below the CCME Guideline for the Protection of Aquatic Life for CN Free, copper and iron, the parameters considered indicators of mill seepage.

Follow-up monitoring will continue in 2021.

8.12.3.1.6 Meadowbank EEM Biological Monitoring

ECCC approval of the Environmental Effect Monitoring Study 3 Interpretative Report was received on May 21st, 2020 for field studies conducted in 2017.

As per the regulation, field work for the EEM Cycle 4 was conducted in 2020, and the associated interpretive report is due on July 1st, 2021.

8.12.3.1.7 Meadowbank Fish-out Studies

No fish-outs were conducted at the Meadowbank site in 2020.

8.12.3.1.8 AWAR and Quarries Water Quality Monitoring

Under the Freshet Action Plan, pre-freshet and freshet inspections were conducted at crossings along the AWAR in 2020. These inspections are conducted to document the presence/absence of flow, erosional concerns and turbidity plumes. 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 for culverts and bridge crossings along the AWAR are documented by Environmental Technicians.

A total of 15 inspections were conducted between May 1st and August 2nd, 2020 (7 in May, 4 in July and 3 in July, and 1 in August). No visual turbidity plumes or erosional concerns 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 2020.

8.12.3.1.9 Meadowbank Blast Monitoring

In 2020, no blast monitoring was required for the Meadowbank site because mining operations ceased in 2019.

8.12.3.1.10Meadowbank Air Quality Monitoring

The complete 2020 Air Quality and Dustfall Monitoring Report is provided in Appendix 46 and results are summarized in Section 8.14.1.

In general, the vast majority of onsite air quality and dustfall measurements were well below regulatory standards and monitoring thresholds. The observed occasional exceedances were considered to be outliers, and not indicative of trends requiring supplemental mitigation action.

No exceedances of monitoring thresholds occurred for AWAR or Whale Tail Haul Road dustfall monitoring stations.

8.12.3.2 *Integration of Monitoring Results*

The 2020 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).

According to the AEMP, the results of the monitoring programs were integrated in a mechanistic fashion with a thorough review of results to identify any patterns among the relevant receiving water monitoring programs. In cases where regular exceedances of triggers or guidelines occurred, along with potential for mine-related impacts to the receiving environment, the potential source, stressor, transport pathways, exposure media, and effects measures were evaluated.

8.12.3.2.1 Identification of Trigger or Guideline Exceedances

As in previous years, two situations occurred where triggers or guidelines were regularly exceeded, likely as a result of mining activities. Both were identified through the CREMP:

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 (alkalinity, conductivity, hardness, major cations, silicon, and total dissolved solids).

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 2020 were similar to findings in previous years and were considered unlikely to cause any adverse effects to the aquatic community, results were reviewed in relation to those from other AEMP programs in Section 8.12.3.2.2 below.

Conceptual site models were developed to assist in linking possible incremental changes in the receiving environment that are evaluated in separate monitoring reports (Figures 21 and 22).

8.12.3.2.2 Evaluation of Potential Sources and Discussion

8.12.3.2.2.1 Changes in Conventional Parameters and Major Ions in Meadowbank Site Receiving Surface Waters

In 2020, 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 for conductivity (TPN, TPE, SP, WAL); hardness (TPN, TPE, SP, WAL); total dissolved solids (TPE, SP, WAL); alkalinity (TPN, TPE, SP); and, major cations (i.e., calcium and magnesium [TPN, TPE, SP, WAL]). In the absence of effects-based thresholds (e.g., CCME water quality criteria) for these parameters, their CREMP triggers (early warning assessment values) were set at the 95th percentile of baseline data. While these changes to water quality are mine-related, 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. In 2019, a literature review was undertaken as a component of the CREMP report to further confirm this interpretation (Appendix J of the 2019 CREMP Report).

Notwithstanding, consideration was given here to all potential mine-related sources (namely, effluent release, seepage, managed surface water, groundwater, and fugitive dust) that may contribute to changes in general water quality parameters. The conceptual site model presented in Figure 21 assists in understanding the possible linkages (i.e., effect to stressor from the source).

Based on the monitoring results for all potential pathways in 2020, it was determined that the most likely source of changes to conventional parameters continues to be effluent discharge and potentially, managed non-contact water discharge (likely current and historical).

The text below provides a review of results for both regulated parameters and the non-regulated parameters described above with CREMP trigger exceedances for all potential pathways, to assist in identifying sources.

Effluent Discharge and Seepage Results

In 2020, the only source of effluent discharge for the Meadowbank site was East Dike seepage, which was released to Second Portage Lake. As described in Section 8.12.3.1.5.1, all water quality samples collected in 2020 at this final discharge point (East Dike discharge – ST-8/ST-MMER-3) complied with MDMER/NWB Water License criteria for TSS. Some sublethal toxicity was reported in 100% effluent samples, but the interpretation of those results will be combined with biological monitoring data in the report which is due to regulators in July, 2021. Those data will be incorporated in future AEMP evaluations.

Since effluent may be contributing to changes in non-regulated water quality parameters in the receiving environment, available results for those parameters exceeding triggers in the CREMP report were reviewed (hardness/alkalinity, conductivity, major ions, TDS) for effluent samples in this context. Since these parameters are largely inter-related, conductivity is used as an indicator parameter in this review.

While CREMP triggers do not specifically apply to effluent results from an effects assessment perspective, they are used here to understand the potential for a source to be contributing to observations of water quality changes in the receiving environment.

Conductivity results for the East Dike seepage effluent in 2020 (64.0 – 87.2 µS/cm; Table 8-3) did exceed the CREMP water quality trigger (27.4 µS/cm), which was set at the 95th centile of baseline data. Exceedances also occurred in the EEM exposure area (36.7 – 46.6 µS/cm) and reference area, though to a lesser degree (26.8 – 33.5 µS/cm). These results suggest that effluent discharge could be contributing to the observed water quality changes in the CREMP near-field lakes, as determined in previous years.

In addition to effluent, the Portage Waste Rock Storage Facility seepage event in July 2013 during which water migrated through the perimeter rockfill road at sample station ST-16 and into NP-2 Lake is assessed as a potential historical source of impacts to NP-2 and ultimately Second Portage Lake. However, since 2014, a permanent pumping system has been operating at ST-16, to collect water and pump it to the TSF North Cell, so that pathway is no longer considered a release pathway, or likely source of impacts to the receiving environment. Nevertheless, water quality in NP-2 is monitored during open water, and measured concentrations of the indicator parameters of interest here were reviewed. Field-measured conductivity in 2020 ranged from 133.9 – 199.2 µS/cm in NP-2 (Table 8-25), suggesting that the NP-2 – NP-1 – Dogleg Lake pathway could potentially be contributing to the changes in water quality observed in Second Portage Lake. Water quality is not assessed further downstream in this pathway (i.e. NP-1 Lake, or Dogleg Lake). These lakes receive inputs through overland runoff and directly from the East diversion ditch (discussed below).

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, monitoring in TPL (Section 8.12.3.1.5.3) 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. Therefore, this historical seepage event is not considered a significant source of changes to the surface water quality observed in the CREMP.

Managed Surface Water Results

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 Portage Lake via NP-2 (East diversion ditch) and Third Portage Lake (West diversion ditch). Much like results for effluent discharge, no regulatory criteria were exceeded for this managed surface water in 2020 except a June samples for TSS. However, monthly field-measured conductivity in both locations (East: 44.5 – 191.8 µS/cm; West: 20.3 – 50.5 µS/cm) commonly exceeded the CREMP trigger (27.4 µS/cm), which again doesn't apply directly to these locations, but indicates they could be a source of the elevated conductivity and related parameters observed in Second and Third Portage Lakes. The East diversion ditch discharges into NP-2, where elevated conductivity (relative to CREMP triggers) was also observed, as described above.

Groundwater results

Results of groundwater monitoring have indicated that water quality in wells located just inside the perimeter of the Portage area dewatering dikes is indicative of natural groundwater. Furthermore, the observed CREMP trigger exceedances are not for parameters considered representative of the primary onsite source of potential groundwater contamination (reclaim water). Therefore CREMP trigger exceedances in the receiving environment surface water do not appear to be caused by an interaction with any potential onsite source of contamination via groundwater.

Air Quality and Dustfall Results

Based on conceptual models, another potential contributor could be fugitive dust migration. Review of air quality monitoring results indicates that rates of dustfall and concentrations of suspended particulates rarely exceed available standards or guidelines at minesite monitoring stations. It is therefore considered unlikely that dust generation has been great enough to cause the observed changes in water quality parameters, particularly since all near-field lakes monitored under the CREMP are of relatively large surface area and volume.

Summary

Although these results and ongoing CREMP analyses indicate that the observed changes in water chemistry are likely mine-related, a thorough literature review and analysis in the 2019 CREMP report indicates that concentrations of these parameters at Meadowbank (which were similar in 2020) remain well below concentrations associated with adverse effects reported in the literature.

This conclusion is further corroborated by results of associated monitoring programs for receptors of concern (phytoplankton, periphyton, benthic invertebrates, zooplankaton, fish & fish habitat) in 2020 or the last available year:

- Some toxicity was observed for East Dike 100% effluent in EEM testing. However, toxicity results in 100% effluent are not considered representative of receiving environment conditions, and the full interpretation will be available in July, 2021 for consideration in future AEMP evaluations.

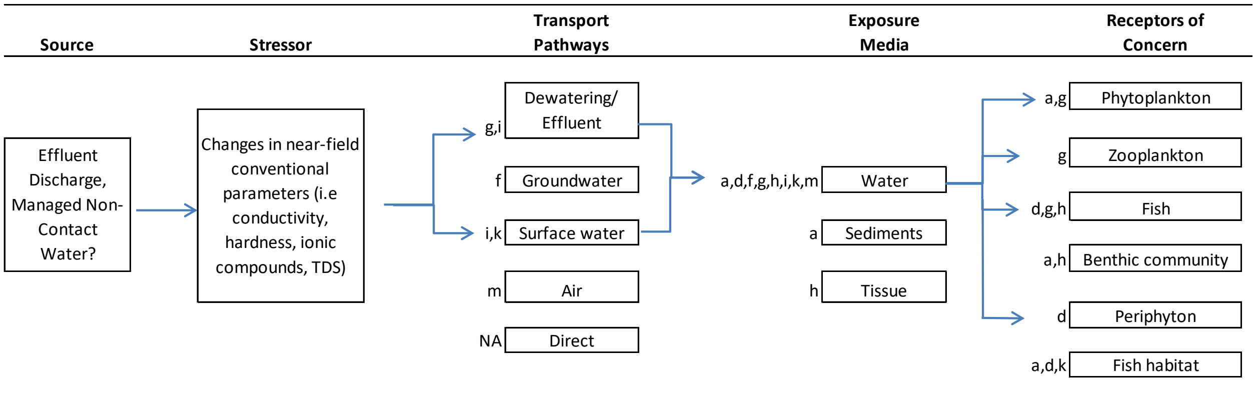
- The most recent (2017 – Wally Lake) EEM biological results indicated no impacts to fish populations. Analysis of the benthic community did not indicate a degraded condition relative to the baseline period.

- 2020 and other recent CREMP results did not detect significant mine-related changes in phytoplankton or benthic invertebrate community metrics in these basins.

- While HCMP monitoring is not yet at a point where final determinations of the success of compensation features can be made, results to date indicate that periphyton growth continues on dike faces (although slowly), interstitial water quality meets CCME criteria in nearly all recent samples (with occasional exceedances for TSS and phosphorus, historically), and fish presence around the dike faces has been confirmed.

Thus, any mine-related impacts to receptors of concern will continue to be assessed through the scheduled monitoring programs and no adaptive management is planned in relation to these trigger exceedances for parameters without effects-based thresholds.

Figure 21 Meadowbank integrated conceptual site model for 2020 AEMP assessment of changes in near-field water quality 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.

8.12.3.2.2.2 Changes in Chromium in TPE Sediment

8.12.3.2.2.1 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).

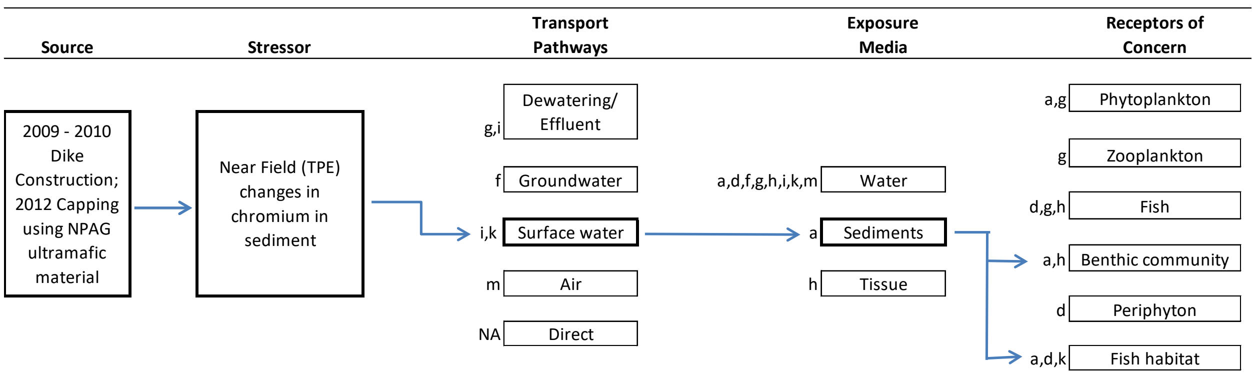
Figure 22 provides the conceptual site model of impacts due to capping and construction of the Bay-Goose dike. Previous reviews of sediment data and historical water quality data have ruled out effluent and dust as the most likely sources of change, and dike construction was identified as the contributing event. Since that time, efforts have focused on determining the extent and ecological significance of the observed changes on receptors of concern (primarly the benthic invertebrate community, as well as fish habitat provided by dike faces).

To this end, targeted studies were conducted in 2015, 2018, and 2019. While sediment chemistry results have indicated increased concentrations of chromium at TPE that are likely related to dike construction, targeted bioavailability studies and the ongoing benthos community assessment under the CREMP clearly demonstrate that the change is not adversely affecting the benthos community (see full details in the 2020 CREMP Report – Appendix 33).

Results of 2020 sediment coring support the previous findings that chromium concentrations have stabilized. No additional targeted studies are planned for TPE at this time.

The other receptor of concern in this case is fish habitat, which is assessed through the Habitat Compensation Monitoring Program, which was last conducted in 2019. The next HCMP event is scheduled for 2021.

Figure 22 Meadowbank integrated conceptual site model for 2020 AEMP assessment of 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 *Recommended Management Actions*

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. No supplemental management actions are therefore planned for 2021 in relation to results of this AEMP analysis.

The following routine monitoring programs are planned:

- CREMP

  - Routine CREMP monitoring (limnology, water quality, phytoplankton, sediment grab samples, benthic community assessment)

- MDMER & Water Quality and Flow Monitoring
  - Monitoring will continue as per the monitoring plan, NWB Water License and MDMER requirements in 2021.
- EEM Biological Monitoring Studies
  - EEM biological monitoring was conducted in 2020 and the report will be provided in July, 2021, according to legislated timelines.
- Habitat Compensation Monitoring
  - The regularly scheduled HCMP monitoring will be conducted in 2021.
- Dewatering Monitoring
  - No lake dewatering is planned for the Meadowbank site in 2021.
- Fish-out Monitoring
  - No fish outs for the Meadowbank site are planned for 2021.
- Blast Monitoring
  - No blasting is planned to occur for the Meadowbank site in 2021.
- Groundwater Monitoring
  - A number of recommendations related to water level monitoring, well maintenance, sampling equipment, and analytical parameters are provided in the 2020 Groundwater Monitoring Report for the Meadowbank site (Appendix 42).
- Air Quality Monitoring
  - No specific recommendations for additional management or monitoring actions related to air quality concerns are made for 2021.

8.12.4 Whale Tail Site AEMP

As required by NWB Water License 2AM-WTP1830 Schedule B, Item 19: *The results of monitoring under the AEMP.*

8.12.4.1 *Summary of Results of AEMP- Related Monitoring Programs*

In 2020, AEMP-related monitoring programs for the Whale Tail site included:

- Core Receiving Environment Monitoring Program (CREMP);
- Dike Construction and Dewatering Monitoring;
- Groundwater Monitoring;
- Metal and Diamond Mining Effluent Regulation (MDMER) Monitoring;
- EEM Biological Studies;
- Minesite Water Quality and Flow Monitoring;
- Visual WTHR and Quarries Water Quality Monitoring;
- Blast Monitoring; and
- 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. Air quality, the EEM biological studies and the Fish Habitat Offsets Monitoring Program are 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 AEMP under the Type A Water License; Part I-1.

Programs that are components of the AEMP but were not required to be conducted for the Whale Tail site in 2020 include fish habitat offsets monitoring (constructed offsets).

Summaries of each AEMP monitoring program are provided throughout this Annual Report, and referenced below, with additional details relevant to the AEMP, as necessary. Table 8-121 further summarizes the results of these programs in 2020 for the Whale Tail site. For detailed results of individual monitoring programs, refer to the appended reports, as referenced below. At the individual level, none of the effects-based triggers or guideline exceedances observed through these programs were assessed as having the potential to cause significant risks to the aquatic receiving environment requiring immediate changes in management actions.

Table 8-121. Summary of aquatic effect monitoring program results for the Whale Tail site in 2020.

	Core Receiving Environment Monitoring Program	Effects Assessment Studies	Dike Construction Monitoring	Fish Habitat Offsets Monitoring	Dewatering Monitoring	MDMER Monitoring	EEM Biological Monitoring	Water Quality and Flow Monitoring	Visual Whale Tail Haul Road and Quarry Water Quality Monitoring	Blast Monitoring	Groundwater Monitoring
Completed in 2020?	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**
Stressor Variables											
suspended solids	○				○	○		○	○	NA	NA
sediment deposition	NA				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	NA	NA
other physical stressors	○				NA	NA		○	NA	◍	NA
Effects Variables											
Phytoplankton	◍				NA	NA		NA	NA		NA
Zooplankton	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 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

The Core Receiving Environment Monitoring Program report for 2020 is provided in Appendix 33, and additionally summarized in Section 8.1. Highlights in the AEMP context are provided below. A spatial and temporal trend assessment for parameters exceeding trigger values is provided in Table 8-122.

Briefly, some water quality trigger exceedances were observed in near field areas for ionic compounds, nutrients, lithium and silicon. Similar to results seen over the years at the Meadowbank study lakes, the trends identified above represent increases above baseline/reference conditions only; except for total phosphorus, none of the analytes with concentration increases above trigger values that were statistically significant in 2020 have CCME effects-based guidelines for the protection of aquatic life. Concentrations of phosphorus were predicted in the FEIS Addendum to increase beyond CREMP triggers, as observed.

Specific monthly FEIS predictions for WTS and MAM were exceeded for some parameters (ammonia, nitrate, total phosphorus (only WTS), sulphate, total alkalinity, TDS, several ionic compounds and several total metals) in one or more sampling events. However, only manganese (which does not have a CCME guideline) exceeded the 10x level of uncertainty associated with these predictions, and the overall FEIS predictions of low impact significance (<1x CCME) for all parameters except phosphorus (which was medium, or 1-10x CCME), were met. Despite some early warning triggers and some specific monthly FEIS predictions being exceeded in 2020, the absolute concentrations of these parameters remain far lower than concentrations associated with adverse to aquatic life.

Phytoplankton biomass was highly variable in 2020, with some observed increases and decreases relative to control or baseline conditions. However, none of the apparent changes were statistically significant. Similar to the patterns observed in Meadowbank study area lakes over the years, the apparent decreases in biomass seem more related to the relatively higher biomass at the reference area (INUG) rather than lower biomass at WTS or MAM. The trends observed for biomass in 2020 were similar to 2019 and appear to be due to the combined influence of natural variability and mining-related activities (likely release of nutrients with flooding). Statistical analysis did indicate a significant decline in phytoplankton taxa richness in WTS, though considerable natural variability makes it hard to definitely establish whether this is mine-related. This trend will be monitored closely in 2021.

For sediment, lakes in the Whale Tail study area have naturally high concentrations of some metals, which was considered in the development of trigger values. Sediment coring in 2020 indicated some exceedances of trigger values for arsenic, copper, and chromium. However, with significant natural heterogeneity, only one year of statistical analysis, and no trigger exceedances for these metals in water samples, these findings are not considered to be mine-related at this time.

No mine-related impacts to the benthic invertebrate community were observed.

Table 8-122 Summary of 2020 CREMP results for the Whale Tail site (Appendix 33). Figure/Table/Section references are from Appendix 33.

Notes
1. Temporal and spatial trends are outlined for Monitoring Components and Variables that exceeded trigger or thresholds (i.e., apparent change from baseline)
2. Spatial scale ratings are: localized = small area within the lake/area; wide-spread = basin to whole lake
3. Causality ratings are: low = no evidence of a mine-related source; moderate = some likelihood of a mine-related source; high = the source of the change is likely mine-related

Variable	Summary	Temporal and Spatial Trend Assessment[1, 2, 3]
Limnology		
Oxygen and Temperature	The limnology profiles collected in 2020 show dissolved oxygen and temperature readings are consistent with range of conditions observed in previous monitoring cycles (2015 to 2018).	Spatial and temporal trends were stable in 2020.
Conductivity	There was a slight increase in field conductivity in WTS between March and May; however, conductivity returned to levels comparable with baseline by July. The conductivity in MAM indicated a spatial trend with higher conductivity readings in the east basin compared to the west basin. Conductivity readings in MAM increased to > 150 µS/cm from the baseline of approximately 60 µS/cm. Conductivity within the other Whale Tail study area lakes was similar to baseline. Conductivity in NEM increased in late 2019 and remained elevated above baseline throughout 2020. Conductivity in Lake A76 was higher than in 2019 and elevated compared to baseline during each sampling event in 2020.	**Spatial scale – localized**; no spatial trends within WTS and observed changes did not extend to Lake A20. Slight spatial trend observed within Mammoth Lake (east basin elevated compared to west basin), however additional sampling across the lake in February showed a relatively well mixed system. The spatial trend extended to Lake A76, though not to further downstream station DS1. NEM is within a separate watershed and there is no spatial trend to review. **Temporal trend – variable (WTS); stable (MAM)**; conductivity in WTS appeared to trend upwards in May but declined to levels similar to baseline for the remainder of the year. Apparent increase in conductivity observed in MAM since late 2018 has remained relatively stable, though higher than baseline. NEM also increased in later 2019 and has remained higher than baseline but was relatively stable in 2020. **Causality – moderate (WTS); high (MAM)**; short duration spike in WTS followed by a return to conditions similar to baseline. Spatial and temporal trends at MAM suggest mine activities are influencing conductivity; however, the limited after data means assigning causality to one activity is not possible. Water management and construction were potentially impacting MAM in 2020.
Water Chemistry		

Variable	Summary	Temporal and Spatial Trend Assessment[1, 2, 3]
Conventional Parameters and Major Ions	Statistically significant increases above trigger values were observed at all NF areas for major ions (e.g. calcium, magnesium). The statistically significant increases extended to MF area Lake A76 for all these parameters except for alkalinity. Minor changes in DS1 for sodium (not significant).	**Spatial scale – widespread**; the 2020 results indicated changes to WTS and MAM and to a lesser extent NEM and A76. **Temporal trend – increasing**; calcium, magnesium, potassium, and sodium may be trending upwards in NF lakes. Evidence of increases in WTS, MAM, and NEM. **Causality – high**; these parameters have increased in the Meadowbank study area lakes and it seems likely that the apparent increase observed in the Whale Tail study area lakes in 2020 follows a similar trend and with more samples in the *after* period, it is easier to assign causality.
TDS	In 2020, TDS concentrations in WTS, MAM, NEM, and A76 were elevated over the previous sample years, and the yearly means were above their respective triggers. All results were statistically significant in the BACI analysis of proportional change.	**Spatial scale – widespread**; TDS concentrations were elevated in WTS, MAM, NEM, and A76 but did not extend to A20 or DS1. **Temporal trend – increasing**; TDS may be trending upwards in NF lakes. However, conditions were relatively stable for the 2020 season. **Causality – high**; increased dissolved solids in MAM, WTS, NEM, and A76 are likely related to construction and dewatering activities.
Nutrients	Statistically significant increases above trigger values were observed at all NF areas for TKN. Total phosphorous (TP) showed a statistically significant increase at WTS, likely the result of inputs from flooded terrestrial habitats following impoundment.	**Spatial scale – widespread**; the 2020 results indicated changes to NF areas WTS, MAM and NEM. **Temporal trend – variable**; no temporal trend was observed except an increase for total phosphorous in WTS. **Causality – moderate**; the changes in TKN concentrations were restricted to NF areas of the Whale Tail study area lakes, which suggests the apparent changes may be due to mine activities in 2020.
TOC and DOC	The yearly mean for TOC and DOC exceeded the trigger in WTS, MAM, A20 and DS1 in 2020. The BACI analysis indicated that the changes at WTS, A20 and MAM (TOC only) were statistically significant.	**Spatial scale – localized**; TOC and DOC were slightly over the trigger in WTS, MAM, A20 and DS1. **Temporal trend – increasing**; there were apparent increases in TOC and DOC at WTS, MAM, A20 and DS1 in 2020. The increases may be associated with the flooding of WTS after the impoundment of WTN. However, there was also an apparent increase in DS1. **Causality – high (WTS, MAM, A20), low (DS1)**; While changes in TOC and/or DOC at WTS, MAM and A20 were likely due to inputs from flooded terrestrial areas, changes observed at far-field Lake DS1 were likely due to natural sources.

Variable	Summary	Temporal and Spatial Trend Assessment[1, 2, 3]
Metals	Statistically significant increases of total and dissolved lithium were observed at NF areas WTS, MAM, and NEM (total only) and at MAM for total and dissolved silicon.	**Spatial scale – localized**; mean lithium concentrations exceeded the trigger value in WTS and MAM but did not extend to Lakes A20 or A76. Mean total lithium concentrations exceeded the trigger at Nemo Lake. Mean silicon concentrations exceeded the trigger value at MAM only. **Temporal trend – variable**; lithium appeared to be relatively stable throughout 2020. Silicon increased above the trigger in early 2020 and then decreased to below the trigger later in the year at most areas affected. **Causality – moderate**; the exceedances of lithium and silicon were only observed at NF areas suggesting they may be related to mining activities.
Phytoplankton		
Chlorophyll-a	There is no trigger for chlorophyll-a for the CREMP. Chlorophyll-a concentrations varied in 2020 but appeared higher in WTS. Early season lows for WTS were around 0.13 µg/L in March. By July WTS had risen to 3.3 µg/L. All other area lakes were generally around baseline levels (~1.0 µg/L).	**Spatial scale – localized**; chlorophyll-a appeared to increase in WTS compared with other lakes in 2020. There was no formal BACI analysis on this parameter. **Temporal trend – variable**; a notable increase in July in WTS was followed by a notable decline in August through September. **Causality – moderate**; a potential spatial trend was not supported by a temporal trend in WTS.
Total Biomass	Total biomass results were highly variable in 2020. WTS and MAM results were generally comparable with baseline but increased to 284 mg/m^3 by July. WTS increased in July to 923 mg/m^3 but decreased to comparable with baseline conditions in September. These maximum values were lower than those observed in 2019, but still higher than those observed in 2018. The BACI analysis showed a non-significant decrease for MAM and WTS, and significant statistical increases for A20 and NEM.	**Spatial scale – localized**; phytoplankton biomass appeared to decrease only at WTS and MAM in 2020. **Temporal trend – variable**; statistical analysis indicated an increase in WTS and MAM over baseline/control; however, time-series plots of biomass show biomass falling in September compared to July. The observed changes were not statistically significant. **Causality – low**; the potential decrease in biomass is only at WTS and MAM. Natural variability in nutrients may have influenced phytoplankton growth. The trends observed were similar to the reference stations PDL and INUG a further indication of natural variability.
Taxa Richness	A statistically significant decrease (30%; p=0.001) in taxa richness was noted at WTS in 2020 relative to baseline/reference conditions. A decrease was also observed at MAM (21%) though it was not statistically significant. Reductions at both stations were above the 20% trigger.	**Spatial scale – localized**; decreased taxa richness relative to reference/baseline conditions was only evident at WTS and MAM. **Temporal trend – variable**; richness has been variable during the *after* period. The apparent decreased richness at WTS and MAM in 2020 relative to baseline/reference conditions is may be attributed to natural variability due to similar observed trends at reference stations INUG and PDL. **Causality – moderate**; the decrease in richness relative to baseline suggests there may be influences from mine activities. However, there is uncertainty due to the limited *after* data.
Sediment Chemistry		

Variable	Summary	Temporal and Spatial Trend Assessment[1, 2, 3]
Metals	Core samples for sediment chemistry were collected at WTS, MAM, NEM, A20, A76 and DS1 in 2020 as part of the coring cycle (i.e., every 3 years with EEM). The results were compared to triggers/thresholds. Parameters with mean concentrations exceeding the trigger value were formally tested using a before-after (BA) statistical model to assess whether concentrations are increasing over time. The mean sediment concentrations exceeded the trigger for arsenic at WTS, for chromium at A20, A76 and DS1, and for copper at A20 and A76. These increases were all statistically significant. Grab samples were collected alongside benthic invertebrate samples and analysed for grain size to support interpretation of benthos results.	**(1.) Spatial scale – localized (As)**; while the 2020 coring results for As at WTS exceeded the trigger and were higher than in 2017, those results are considered an artefact of small spatial scale heterogeneity. **Temporal trend – stable (As)**; As results for WTS, while highly variable within years due to spatial heterogeneity, do not show any apparent temporal trends across all years (Figure 5-80). **Causality – low (As)**;no evidence of mine-related changes for As. **(2.) Spatial scale – localized (Cr)**; chromium is elevated at A20, A76 and DS1. **Temporal trend– stable (Cr)**; mean chromium concentrations at A20 and DS1 appear to be trending higher since baseline, but the range of concentrations are similar to baseline. Chromium concentrations were not elevated at WTS or MAM. **Causality – low (Cr)**; apparent increases in chromium in sediment at A20 and DS1 were likely an artifact of small spatial scale heterogeneity naturally present in each lake because similar increases were not observed for lakes closer to mining activities (e.g. WTS, MAM). **(3.) Spatial scale – localized (Cu)**; copper is elevated at A20 and A76. **Temporal trend – stable (Cu)**; while there was an apparent slight increasing trend in copper at both A20, the concentrations were variable at A76. In both cases, concentrations in 2020 were within the range of baseline copper concentrations. **Causality – low (Cu)**; it appears that the observed patterns of sediment copper at A20 and A76 are due to natural spatial heterogeneity.
Hydrocarbons	Grab samples were collected at WTS, MAM, NEM, A20, A76 and DS1 and analysed for organics. Sediment hydrocarbon concentrations were below detection for all NF area grab samples in 2020.	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		
Total Abundance	Benthic abundance was highly variable between replicates and was variable between stations. Statistical testing indicated an apparent but not statistically significant decrease in abundance in A20 and A76. Overall, 2020 results are similar to baseline years for all stations.	**Spatial scale – localized**; lower abundance (based on the BACI analysis) observed only at A20 and A76. **Temporal trend – stable**; abundance (absolute values) at A20 and A76 show consistent results with the range observed in baseline. **Causality – low**; the 'apparent' reduction in abundance at A20 and A76 in the BACI analysis are partly an artefact of slightly increasing abundance at the reference area INUG. Both A20 and A76 have remained relatively stable since the baseline period.

Variable	Summary	Temporal and Spatial Trend Assessment[1, 2, 3]
Total Richness	Statistical testing indicated a statistically significant decrease in taxa richness at DS1. Overall, taxa richness was comparable to the baseline period.	**Spatial scale – localized**; lower taxa richness only observed at FF station DS1. **Temporal trend – variable;** taxa richness has been highly variable since baseline period, though there appears to be a downward trend at DS1. **Causality – low;** the benthic communities are dominated by chironomids, and the relative proportion of major taxa remains stable at all stations. Furthermore, the apparent decrease in taxa richness was not observed at NF stations closest to mining activities.

8.12.4.1.2 Dike Construction and Dewatering Monitoring

The complete 2020 report on Water Quality Monitoring for Dike Construction and Dewatering is provided as Appendix 39, and summarized in Section 8.5.2.

Briefly, no dike construction occurred in 2020. Water quality monitoring was conducted for dewatering effluent discharged to Whale Tail South from Whale Tail North (January – May) and Lake A53 (September).

No exceedances of NWB TSS criteria occurred for effluent, and no exceedances of CCME guidelines occurred for receiving environment samples.

8.12.4.1.3 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.

8.12.4.1.3.1 Effluent Discharge

ST-MDMER-5/ST-WT-24a (Whale Tail South Temporary Diffuser)

This final discharge point (FDP) with release to Whale Tail South was established in 2019 for Whale Tail North dewatering. In 2020, various intakes were associated with this FDP, including Whale Tail North dewatering (January – May), A53 dewatering (September), and Whale Tail Attenuation Pond discharge (May, June and October).

No exceedances of relevant MDMER or NWB Water License criteria occurred.

Water quality samples were taken from the discharge location (ST-MDMER-5), the receiving environment exposure area (ST-MDMER-5-EEM-WTSE) and reference area (TPS or ST-MMER-1-EEM-TPS) for EEM toxicity testing. Whole-water effluent acute lethality tests (Rainbow trout and *Daphnia magna*) were conducted monthly during discharge (ten occasions). For one test, 30% mortality for *Daphnia* was observed and on all other occasions mortality in 100% effluent was 0%. Results were reported to Environment & Climate Change Canada via the MERS electronic database reporting system.

ST-MDMER-7/ST-WT-2 (Mammoth Lake East Diffuser)

This discharge point with release to Mammoth Lake via a submerged diffuser was used to release Quarry 1 water (April), and water from the Whale Tail Attenuation Pond (May, June, August, September).

No exceedances of relevant MDMER or NWB Water License criteria occurred.

Water quality samples were taken from the discharge location (ST-MDMER-7), the receiving environment exposure area (EEM-7-MAME-2) and reference area (TPS or ST-MMER-1-EEM-TPS) for EEM toxicity analysis. Acute lethality tests with 100% effluent for Rainbow Trout and *Daphnia magna* were conducted on five occasions and 0% mortality was reported in all tests. This data was previously reported to Environment Canada via the MERS electronic database reporting system.

ST-MDMER-8/ST-WT-2a (Mammoth Lake East Diffuser)

This discharge point with release to Mammoth Lake via a submerged diffuser was used for Whale Tail Attenuation Pond discharge in 2020 (June – October).

All results complied with MDMER and NWB Water License water quality criteria.

Water quality samples were taken from the discharge location (ST-MDMER-8), the receiving environment exposure area (EEM-7-MAME-2) and reference area (TPS or ST-MMER-1-EEM-TPS) for EEM toxicity analysis. Acute lethality tests for Rainbow Trout and *Daphnia magna* were conducted on six occasions, and no mortality was reported except in one test (10% mortality in Rainbow trout for 100% effluent). EEM sublethal toxicity testing was also conducted for effluent on two occasions (July and September), and sublethal effects were reported for *Ceriodaphnia dubia* (both events) and *Lemna minor* (September). This data was previously reported to Environment Canada via the MERS electronic database reporting system.

ST-MDMER-11/ST-WT-24b (Whale Tail South Permanent Diffuser)

This discharge point with release to Whale Tail South was used to discharge Whale Tail Attenuation Pond water in 2020 (November, December).

No exceedances of MDMER/NWB criteria occurred, but on one occasion (November sample), Radium 226 was not analyzed, and on another occasion (December), a sample was not collected on time.

Water quality samples were taken from the discharge location (ST-MDMER-11), the receiving environment exposure area (WTSE-1) and reference area (TPS or ST-MMER-1-EEM-TPS) for EEM toxicity analysis. Acute lethality tests for Rainbow Trout and *Daphnia magna* were conducted on two occasions, and no mortality was reported. This data was previously reported to Environment Canada via the MERS electronic database reporting system.

8.12.4.1.3.2 Minesite Water Collection System

Water quality sampling was conducted for various locations involved in onsite water management under the Project's NWB Water License. Those locations with actual or potential direct interaction with the receiving environment include:

-Lake A47 (ST-WT-6)

- o No license limits.

-Lake A45 (ST-WT-13)

- o No license limits.

-Lake A16 (Mammoth Lake) outlet (ST-WT-14)

- o No license limits.

-Lake A15 (ST-WT-15) outlet

- o No license limits.

-Whale Tail Dike seepage (ST-WT-17)

- o Discharged with Whale Tail North Basin dewatering and monitored accordingly (see "Discharge under MDMER" section above) until Whale Tail North dewatering was complete (May 2020),

- o Thereafter, seepage was pumped to the Whale Tail Attenuation Pond and managed accordingly.

-North-East Pond to Nemo watershed

- o Agnico pumped non-contact water from the NE Pond to the Nemo watershed in 2019 and 2020, until the NE Dike was dismantled. To ensure compliance with the Water License 2AM-WTP1830 (WL), Agnico monitored the effluent of the NE Pond for TSS as per WL Part F Item 7 (maximum grab sample TSS concentration of 30 mg/L and maximum monthly mean TSS concentration of 15 mg/L).

- o No exceedances of the Water License criteria occurred.

- o This area was dewatered from August-September, 2020 to permit construction of the IVR Pit.

Complete water quality monitoring results for these locations in 2020 are provided in Section 8.5.3.2.

8.12.4.1.3.3 Seepage

In addition to monitoring for specified locations or events, seepage and runoff from the landfill, waste rock storage facilities, and associated dikes/berms are monitored according to NWB Water License Schedule B, Item 13. Briefly, in 2020, monitoring and mitigation related to seepage and runoff included:

-*Seepage through dewatering dikes*

- o None observed other than Whale Tail (see next bullet point).

-*Seepage through Whale Tail Dike*

- o First noticed in July 2019, and a detailed investigation was conducted along with an intensive dike grouting campaign to reduce seepage flow.

- o To date, managed as Whale Tail North dewatering effluent/Whale Tail Attenuation Pond.

- A pumping system is being installed, to be completed in 2021.

-*Seepage and runoff from the landfill*

- None observed.

-*Subsurface seepage and surface runoff from waste rock piles*

- In August 2019, Agnico informed regulators that flow at the toe of the WRSF Dike was observed to be entering Mammoth Lake.

- Management actions were initiated immediately (August 24th, 2019), by pumping the WRSF collection pond to halt the flow. In addition, an access road to the toe of the dike was constructed to allow installation of a water collection system, which was operated until freeze-up (September 30th, 2019).

- Water quality analyses from the source and receiving environment were collected daily to weekly (August and September, 2019) and showed no toxicity and no exceedance of MDMER criteria.

- In October 2019, the KivIA conducted a sample analysis of the lake bed sediments in Mammoth Lake. The report concluded the seepage did not have a measurable impact on metal quantities of the Mammoth Lake sediments. In 2020, follow-up lake bed sediment samples were analyzed and support the 2019 conclusions.

- Receiving environment water quality monitoring in Mammoth Lake is ongoing under the CREMP (Section 8.1 above), and through this analysis it was determined that any potential change in water quality caused by the WRSF pond leaking into Mammoth Lake had an indistinguishable effect on water quality.

- Overall, results of the 2020 environmental monitoring indicates that there were negligible effects from the WRSF pond seepage on the water quality and sediments in Mammoth Lake. This coincides with the conclusions from the 2019 Mammoth Lake Sediment Sampling Report completed by the KivIA in November 2019.

- Mitigation measures in 2020 consisted of:

  - Maintained low water level in the WRSF Pond (per Meadowbank Dike Review Board recommendation).

  - Promotion of permafrost penetration in the WRSF Dike through strategic snow removal, additional thermal cover material, freeze back performance review.

  - Construction of a water collection system.

- These measures appear to have been effective, and no flow was observed at the toe of the WRSF Dike in 2020.

- Future mitigation measures will include maintaining a low water level in the WRSF Pond again in 2021, along with measures to monitor permafrost penetration in the WRSF Dike.

-*Seepage at pit wall and pit wall freeze/thaw and permafrost aggradation*

- o Seepage has been observed from the south and west walls in Whale Tail Pit.
- o Instrumentation (piezometers and thermistors) has been installed in the south wall for monitoring water levels and permafrost aggradation.

8.12.4.1.4 EEM Biological Monitoring

On July 26th, 2019, Agnico provided to ECCC the first EEM Biological Study Design for the Whale Tail site (Appendix 39 of the 2019 Annual Report). Comments on the study design were received on February 10th, 2020 and Agnico's response was submitted on June 19th, 2020 (Appendix 36). ECCC approval for this EEM Cycle 1 Study Design was received on July 3rd, 2020, and the field program proceeded in 2020. As required under the MDMER, the associated interpretive report with biological monitoring data is due by July 27th, 2021.

8.12.4.1.5 Fish Habitat Offset Monitoring

The complete 2020 report on Fish Habitat Offset Monitoring is provided as Appendix 44, and summarized in Section 8.8.2.

Briefly, monitoring for constructed habitat offsets was not required in 2020. Six research studies are underway as complementary measures for Whale Tail Pit offsetting. Due to field season delays in 2020 as a result of the COVID-19 pandemic, some study periods have been extended by one year. No final publications have yet been submitted (which will fulfill criteria for success) but two are planned to be complete in 2021.

Once final results of these studies become available, they will be used to inform aquatic effects monitoring conclusions as appropriate.

8.12.4.1.6 Whale Tail Fish-out Studies

The fish-out of the IVR area waterbodies for development of the Whale Tail Pit Expansion Project occurred in 2020. The complete report is provided in Appendix 45, and summarized in Section 8.11.2.

Briefly, fish-outs were carried out in 10 waterbodies between July and September, and all were determined to be complete in communication with DFO. With all effort combined, between 0 and 17,682 fish consisting of up to five species (ninespine stickleback, slimy sculpin, Arctic char, burbot, and lake trout) were captured from each of the ten waterbodies. In total, four waterbodies were fish-less, four had populations of only ninespine stickleback, and two contained both small- and large-bodied species.

8.12.4.1.7 Whale Tail Haul Road and Quarries Water Quality Monitoring

Visual inspections for freshet monitoring under the Freshet Action Plan occur daily or weekly during freshet for onsite and Whale Tail Haul road water management infrastructure including culverts, ditches, bridges, and the Whale Tail South channel. Weekly inspections are also conducted on a year-round basis. An inspection log is maintained, documenting general conditions at each location, observations on flow rates and clarity, turbidity sample collection (as required), and any mitigation measures that are implemented. Details are provided in Section 8.5.3.2.15.

Briefly, in 2020, no major erosion concerns that required mitigation actions were identified during visual inspections for Whale Tail Haul Road water management infrastructure, and no water quality samples were required to be collected. As precautionary measures, straw booms or woodchip booms were installed for some culverts and bridges.

For onsite inspections, no major erosional concerns were observed and no water quality samples were required to be collected. However, after observations of some ponding water along the road leading to the emulsion plant, straw booms were deployed downstream of the road as a preventative measure, and in August, culverts were installed to prevent future geotechnical and erosional concerns.

8.12.4.1.8 Whale Tail Blast Monitoring

A Blast Monitoring Report is produced annually, and complete results are provided in that document (Appendix 41).

Briefly, every blast is monitored with an Instantel Minimate Blaster to ensure that vibrations generated by blasting (peak particle velocity; PPV) are less than 13 mm/sec and the overpressure (instantaneous pressure change; IPC) is under 50 KPa at the nearest fish-bearing waterbody (on recommendation of DFO). The results of blast monitoring are systematically analyzed by the Engineering Department within 24 hours following the blasting operation. The blast monitoring results are interpreted and a blast mitigation plan is implemented immediately if the vibrations or the overpressure exceed the guidelines.

For the purposes of fish and fish habitat protection, PPV and IPC was recorded throughout 2020 during blasting activities at Whale Tail and IVR Pits as well as during the construction of the Whale Tail South Channel.

No IPC exceedances occurred in 2020, and a total of four PPV exceedances were recorded. All of them occurred during the period of egg incubation (egg incubation period is from August 15 to June 30). One of these events was associated with the Whale Tail Pit and the other three were recorded during the construction of the Whale Tail South Channel.

The first exceedance was recorded at Mammoth Station, with a PPV of 14.6 mm/s in July 10th, 2020. For this blast, eight (8) preshear holes were detonated on the same delay. 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.

The other exceedances were recorded at the Whale Tail South Channel construction site on January 27th, February 5th and February 10th. Agnico Eagle advised DFO following each event to detail the cause and mitigation measures put in place. All the exceedances were observed at the SWTC-2 station, near the shore of lake A20. Various controls were put in place in order to control the vibrations.

8.12.4.1.9 Whale Tail Groundwater Monitoring

A complete summary of groundwater monitoring is provided in Section 8.7.2, and the Technical Memorandum “Whale Tail Pit Project - 2020 Groundwater Management Monitoring Report” is provided in Appendix 43.

For the Whale Tail site, groundwater monitoring was conducted in 2020 according to the Groundwater Monitoring Plan (2019) to update site water quality and water balance models, primarily in relation to Whale Tail Pit groundwater inflows. This data will support water management activities and water quality planning for pit reflooding.

Through the Groundwater Monitoring Plan, both groundwater inflow quantity and quality (TDS) are compared to FEIS Addendum model predictions. In 2020 there was insufficient data to directly compare TDS observations to model predicted values, given the complexity of mine activities occurring and the uncertainty in water source contributions to the open pit. Inflow rates for the most comparable months (October – December) were somewhat higher than the predicted annual average for 2020/2021. However another three months of winter flow measurements in 2021 are required to obtain the full dataset for comparison.

There are no license limits or trigger values for groundwater quality.

8.12.4.1.10Whale Tail Air Quality Monitoring

The complete 2020 Air Quality and Dustfall Monitoring Report is provided in Appendix 46, and summarized in Section 8.14.2.

Briefly, among 91 suspended particulate samples, one sample exceeded regulatory criteria, but exceedances at this location were predicted in the Project FEIS. No exceedances of monitoring thresholds occurred for dustfall, for onsite or Whale Tail Haul Road monitoring locations.

8.12.4.2 *Integration of Monitoring Results*

The 2020 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).

The results of the monitoring programs were integrated in a mechanistic fashion based on a thorough review to identify any patterns among the relevant receiving water monitoring programs. In cases where exceedances of triggers or guidelines occurred, along with potential for mine-related impacts to the receiving environment, the potential source, stressor, transport pathways, exposure media, and effects measures were evaluated.

8.12.4.2.1 Identification of Trigger or Guideline Exceedances

Outside of the CREMP and the blast monitoring program, no consistent exceedances of relevant guideline values occurred for Whale Tail AEMP monitoring programs in 2020. A review of CREMP results exceeding trigger values and for which BACI trends were statistically significant was conducted in that report (Appendix 33), and results are examined here in the AEMP context, along with blast monitoring exceedances.

The four situations evaluated further are:

1. Increased nutrients: Total kjeldahl nitrogen (TKN) showed a statistically significant increase above trigger values in near field lakes, and total phosphorous (TP) showed a statistically significant increase above trigger values at WTS. Total organic carbon (TOC) and dissolved organic carbon (DOC) showed statistically significant increases at WTS, A20, and MAM.

2. Statistically significant increases above trigger values were observed at near field areas WTS and/or MAM for total alkalinity, conductivity, hardness, calcium, potassium, magnesium, sodium, and TDS. With the exception of alkalinity, these statistically significant increases extended to mid-field (MF) area Lake A76.

3. Statistically significant increases above trigger values were observed at NF areas WTS, MAM, and NEM for total and/or dissolved lithium, and dissolved silicon at MAM.

4. DFO's PPV limit of 13 mm/s was exceeded in four blast monitoring measurements.

8.12.4.2.2 Evaluation of Potential Source and Discussion

Overall, six major site activities occurred in 2020 with the potential to impact water quality in the receiving environment. These consisted of:

- IVR Area and Lake A53 dewatering to Whale Tail South (September);
- Whale Tail North Basin dewatering to Whale Tail South (January - May);
- Ongoing inputs from Whale Tail South terrestrial flooding (flooding was mainly complete in 2019)
- Construction of the South Whale Tail Channel (January – April)
- Attenuation Pond and Quarry 1 discharge to Mammoth Lake (April, June – October)
- Attenuation Pond discharge to Whale Tail South (May-June, October – December)

As described in the 2020 CREMP report, since this was the second complete year of monitoring for the "impact" period, the limited amount of "after" data in the BACI analysis means that assigning causality and identifying the specific source of impacts is difficult. Nevertheless, for each of the situations identified in Section 8.12.4.2.1, results are reviewed and discussed in the context of these potential sources, using results of other relevant AEMP monitoring programs to inform the assessment.

8.12.4.2.2.1 Increase in Nutrients

Statistically significant increases were observed for TKN (WTS, MAM, NEM) and total phosphorus in WTS. Statistically significant increases for TOC and DOC also occurred in WTS (as in 2019), as well as MAM (except DOC) and Lake A20 (both new in 2020).

Trends in total phosphorus within the CREMP and across AEMP programs are reviewed here as the key nutrient indicator parameter, because it has CCME guidelines, and because those were predicted to be exceeded in the FEIS Addendum water quality modeling.

Phosphorus concentrations were predicted in the FEIS Addendum to increase beyond CREMP triggers, and briefly beyond the CCME mesotrophic range (10 - 20 µg/L) during the operations phase in Mammoth Lake, to a maximum of 29 µg/L (in 2021). Concentrations were predicted to be largely within the mesotrophic range for WTS during operations, to a maximum of 20 µg/L (in 2026). While some measurements of phosphorus have exceeded monthly FEIS predictions (particularly in WTS), all were within one order of magnitude (the level of uncertainty assigned to these predictions in the FEIS), and all concentrations were below or within predicted trophic levels.

The CREMP conclusion that increased nutrients in WTS and MAM are primarily due to flooding is generally supported by measurements conducted through other AEMP programs (dike construction in 2019 and effluent monitoring in 2019 and 2020), through which very few exceedances of laboratory detection limits for total phosphorus have been observed (Section 8.3.2). However, it is noted that detection limits for total phosphorus in these programs (0.01 mg/L) exceed the CREMP trigger value (0.004 mg/L) and most CREMP water quality measurements for WTS and MAM in 2020 (2020 CREMP Report, Figure 5-30).

The potential for increased nutrient concentrations in downstream lakes to further impact primary productivity and higher trophic levels was also predicted, though changes were not quantified. Comparisons of observed and predicted changes for those metrics are further explored in Section 12.5.1.3.2 – PEAMP Fish and Fish Habitat Discussion. Changes to primary production are assessed through the CREMP, while changes to fish populations are assessed through a research program initiated as part of fish habitat offsetting for Whale Tail Pit.

Briefly, in 2019, statistically significant increases in phytoplankton biomass observed in WTS were associated with elevated nutrient concentrations. In contrast, patterns observed at WTS in 2020 were consistent with natural seasonal blooms in phytoplankton productivity. The notable increase in biomass observed for WTS and MAM in 2019 was likely due to a surge in nutrients associated with inputs from the flooded tundra after impoundment. In 2020, this surge seems to have mostly subsided.

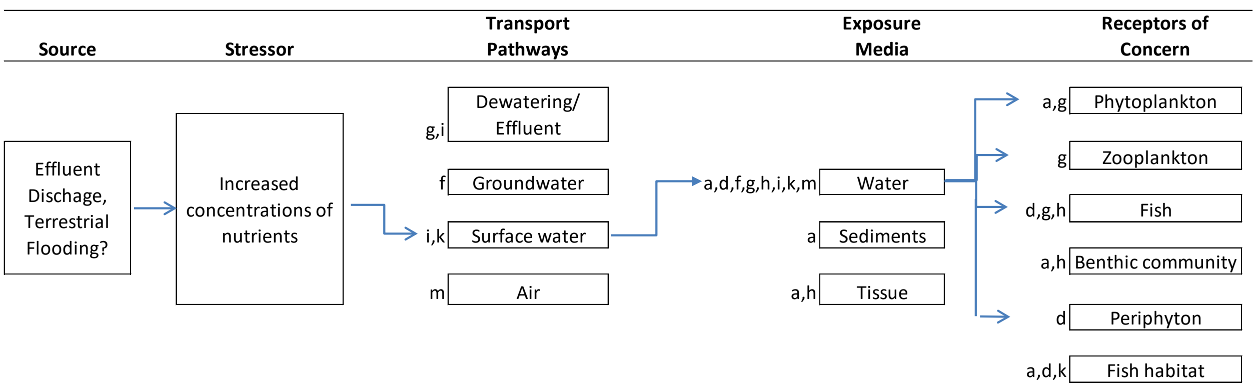
As described in the Whale Tail Pit Fish Habitat Offsetting Plan – Appendix C (Complementary Measures), it was expected that due to release of terrestrial nutrients during flooding of WTS, there would be increases in the lower trophic food base for fish, potentially resulting in numerical increases in forage fish such as Slimy Sculpin (through increases in growth and reproduction rates). To address this uncertainty, a research study in partnership with the University of Waterloo is underway to identify any impacts to fish populations (Appendix 44 – Fish Habitat Offset Monitoring Report). This study is expected to be completed in 2022, at which time full results will be available. Additionally, results of the first EEM

Interpretive Report for the Whale Tail site (due July, 2021) will be used in future years to assist the AEMP evaluation of potential mine-related impacts to higher trophic levels.

As described in the 2020 CREMP report, the ecological significance of increased primary productivity at WTS (and MAM) will depend on how long these trends continue and how far they extend. Minor changes (e.g., changes in biomass that retain the general structure of the community and are relatively short-lived) are unlikely to be important ecologically, while larger or more extensive changes could start to change food chain dynamics in these typically low productivity lakes.

Since to date the observed changes appear to be within the scope of those predicted within the FEIS Addendum, adaptive management is not planned at this time and trends for total phosphorus, phytoplankton, and small-bodied fish populations will continue to be tracked closely in 2021.

Figure 23. Whale Tail site integrated conceptual site model for 2020 AEMP assessment of increased nutrients in Whale Tail South and Mammoth Lake.



Notes:

a	Core Receiving Environment Monitoring Program
b	Effects Assessment Studies
c	Dike Construction Monitoring
d	Fish Habitat Offsets 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

8.12.4.2.2.2 Increases in Conventional Parameters, Major Ions, and TDS in Near Field Lakes

Statistically significant increases above CREMP trigger values were observed at near field (NF) areas WTS, MAM and NEM for total alkalinity, conductivity, hardness, calcium, potassium, magnesium, sodium, and TDS. The statistically significant increases extended to mid-field (MF) area Lake A76 for all of these parameters except alkalinity. While some exceedances of specific monthly FEIS Addendum water quality model predictions occurred for these parameters, none exceeded the order-of-magnitude level of uncertainty associated with those predictions.

Conductivity is a composite variable that responds positively when concentrations of ionic compounds increase (e.g., chlorides, sulphates, carbonates, sodium, magnesium, calcium, potassium and metallic ions), so conductivity is used here to broadly assess potential causation of changes in those parameters.

In 2019, the increase in conductivity appeared to be limited spatially to NF areas, but as mining activities expanded in 2020, these results extended into some MF areas. Similar to 2019, the CREMP trigger for conductivity (48.6 µS/cm) was exceeded in all 2020 samples for WTS and MAM, along with NEM and A76 (new in 2020). Mean conductivity for WTS was 93.8 µS/cm, for MAM was 167 µS/cm, for Lake A76 was 74.6 µS/cm, and for NEM was 104 µS/cm. The BACI analysis indicated that these changes were statistically significant. In all cases, the increases from reference/baseline conditions were substantial (2 – 3.5x).

As described in the 2020 CREMP report, it is likely that the observed changes in WTS, MAM, and NEM are related to a combination of physical-chemical changes due to direct impacts of construction activities and inputs from dewatering and effluent discharge activities. To a lesser degree, the observed changes extended downstream as far as A76, but not beyond.

These conclusions are supported by results of the other AEMP programs. No dike construction occurred in 2020, so additional conductivity monitoring was only conducted as part of dewatering monitoring and effluent discharge. Results for effluent discharged to WTS and MAM indicated that conductivity in all effluent intakes (Whale Tail North, A53, Attenuation Pond, Quarry 1) exceeded CREMP results for WTS and Mammoth Lake, with a range of 180 – 1010 µS/cm (Section 8.3.2). Receiving environment samples (WTS and MAM) were similar to CREMP results (87.1 - 278.7 µS/cm), while reference lake concentrations were all less than 33.5 µS/cm. Under the mine site water collection system monitoring, field-measured conductivity at the Mammoth Lake outflow (113.8 - 457 µS/cm) and downstream lake A15 outflow (110.4 – 233 µS/cm) were also elevated compared to the previous year (75 µS/cm and 73 µS/cm on average, respectively), consistent with CREMP results.

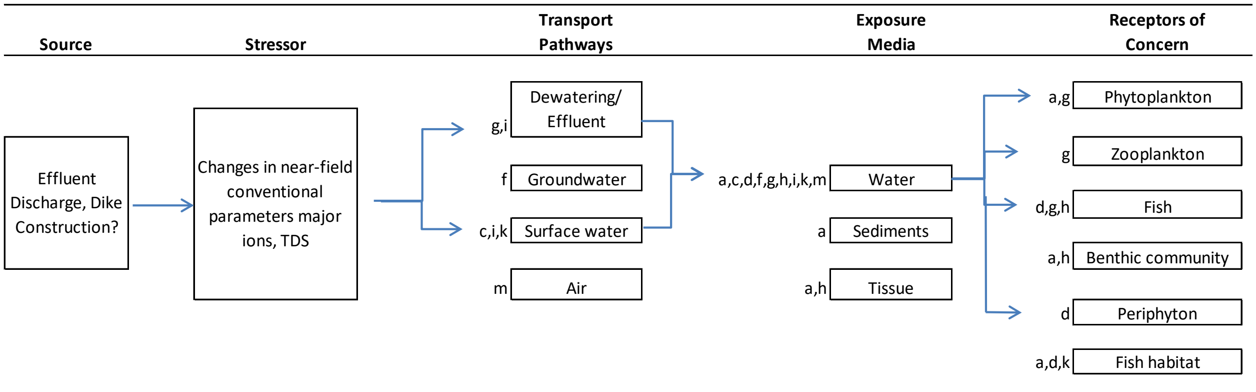
These results continue to suggest that for WTS, MAM and to a lesser degree, A76, it is likely that effluent discharge and lake dewatering activities, coupled with the flooding caused by the impoundment, are the route of increased conventional parameters, major ions, and TDS.

While some of these parameters were also significantly elevated in Nemo Lake in 2020, no additional water quality monitoring is conducted for Nemo Lake outside of the CREMP, except the analysis of Northeast Diversion pond discharge. As shown in Table 8-56, conductivity was significant elevated in this discharge in 2019 (1832 µS/cm), and still elevated in 2020 (321 µS/cm). Since this water is discharged to tundra and not directly to Nemo Lake, it is difficult to assign causation, however it likely that residual impacts of dewatering discharge activities in 2019 are being observed in 2020.

Overall, these upward trends in conductivity, hardness, ionic compounds and TDS are similar to those observed in the Meadowbank near-field CREMP lakes, where there is now no evidence to suggest concentrations are increasing year-over-year or that the observed concentrations would result in adverse ecological effects. In 2019, a literature review was undertaken as a component of the CREMP report to further confirm this interpretation (Appendix J of the 2019 CREMP Report).

Since according to this review, measured concentrations are not associated with adverse ecological effects, and overall water quality measurements do not exceed the scope of FEIS Addendum predictions, no adaptive management actions are planned at this time. Trends will be monitored closely in 2021 to examine whether values stabilize or continue to increase.

Figure 24 Whale Tail site integrated conceptual site model for 2020 AEMP assessment of changes in near-field conventional parameters, major ions, and TDS (Whale Tail South, Mammoth Lake, Nemo Lake)



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
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j	Fish-Out Studies
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l	Blasting
m	Air quality monitoring

8.12.4.2.2.3 Increase in Lithium and Silicon in WTS and MAM

Silicon concentrations have historically been close to the trigger value for most Whale Tail study area lakes. Total silicon concentrations exceeded the trigger (0.61 mg/L) in one or more samples collected in 2020 in all Whale Tail impact lakes except for Nemo Lake, with concentrations in all impact lakes being higher during the first half of the year; the yearly mean concentrations also exceeded the trigger in WTS (0.63 mg/L) and MAM (1.0 mg/L). Silicon is not required to be measured outside of the CREMP, so potential sources of impacts cannot be specifically evaluated through review of the other AEMP program results. There are no FEIS Addendum water quality model predictions for this parameter, and no effects-based thresholds (CCME guidelines). With results returning to near-trigger values during the second half of the year, trends will continue to be monitored through the CREMP, and this item is not further evaluated here.

Lithium concentrations in both WTS and MAM were highest in spring 2019 but trended lower for the remainder of that year to just above the trigger by the last sampling event in September. The apparent down trend in concentrations in 2019 continued into 2020, suggesting that the systems are stabilizing. The yearly mean concentrations of both total and dissolved lithium exceeded the trigger concentration in both WTS and MAM (total and dissolved lithium trigger = 0.0020 mg/L) and the yearly mean concentration of total lithium marginally exceeded the trigger concentration in NEM.

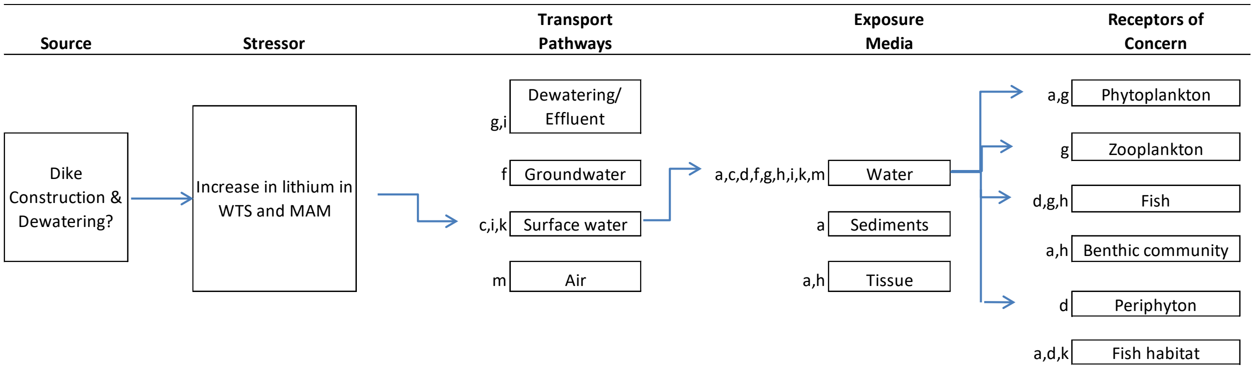
In 2019, concentrations of total lithium measured approximately weekly during Mammoth Dike construction (Feb-Mar) were all below detection limits (0.005 mg/L) in WTS, but were slightly elevated in MAM (up to 0.008 mg/L, similar to the maximum observed in the March and May CREMP sampling), and further elevated in the impounded area of WTN (up to 0.015 mg/L). These results suggested that slightly elevated concentrations of lithium in WTS and/or MAM early in the 2019 season may have been caused by dike construction and WTN dewatering activities. No dike construction occurred in 2020, and lithium was not required to be measured as a component of dewatering monitoring. Lithium was also not required to be measured as a component of MDMER effluent discharge monitoring in 2020, but it is measured weekly in discharge under NWB Water License criteria. Detection limits for these sampling programs exceed the CREMP trigger value (0.005 vs 0.002 mg/L), but results are reviewed to understand possible linkages at a high level. Total lithium in Whale Tail Dike seepage discharge (ST-WT-17) to Whale Tail South was non-detectable (<0.005 mg/L) in all but one sample (0.008 mg/L). Similarly, total lithium in Whale Tail Attenuation Pond discharge to Whale Tail South was non-detectable in all but one sample per diffuser location (0.008 and 0.013 mg/L, for ST-WT-24 and 24b, respectively). However, concentrations in Whale Tail Attenuation Pond discharge to Mammoth Lake (ST-WT-2 and 2a) were measurable in most weekly samples, and annual averages (0.00906 and 0.0091 mg/L for east and west diffusers, respectively) exceeded the CREMP trigger (0.0020 mg/L). Though the trigger does not specifically apply to effluent, and there is no CCME water quality guideline for lithium, these results suggest that Attenuation Pond discharge may have contributed to the ongoing observed trigger exceedances in MAM in early 2020.

At both the Mammoth Lake outlet (A16) and A15 outlet, total lithium measured monthly through the minesite water quality and flow monitoring program was always non-detectable (<0.0050 mg/L) except one June sample (0.007 mg/L). These results are consistent with the CREMP, which showed trigger exceedances did not extend downstream past Mammoth Lake.

Since lithium does not have an effects-based threshold (CCME guideline), and since the scope of FEIS Addendum water quality predictions was not exceeded, no adaptive management actions are planned at this time beyond routine monitoring.

Since in-water dike construction and WTN dewatering is complete, concentrations are expected to further stabilize in 2021 if these were the sources of the observed initial changes to water quality in WTS.

Figure 25. Whale Tail site integrated conceptual site model for 2020 AEMP assessment of changes in lithium concentrations.



Notes:

a	Core Receiving Environment Monitoring Program
b	Effects Assessment Studies
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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

8.12.4.2.2.4 PPV Exceedances

As described in the Blast Monitoring Report (Appendix 41), a total of four PPV measurements for the Whale Tail site exceeded DFO's limit of 13 mm/s in 2020 (primarily in Jan-Feb). These exceedances occurred at monitoring stations established near A20 (three exceedances) and Mammoth Lake (one exceedance). In this case, the source of the stressor is evident (i.e. blasting activities), so causality does not need to be assessed. Since the exceedances are isolated events, it is considered unlikely that any impacts on fish populations would be measurable. However, potential impacts of the project to receptors of concern (fish and fish habitat) are reviewed in the context of results from related monitoring programs that were conducted in the Whale Tail area in 2020 (as shown in Figure 24, these include the CREMP, MDMER, and EEM Biological monitoring).

In 2020, results of receiving environment monitoring under the CREMP and MDMER have not indicated significant unpredicted trends of ecological concern to fish that could compound impacts of blast exceedances.

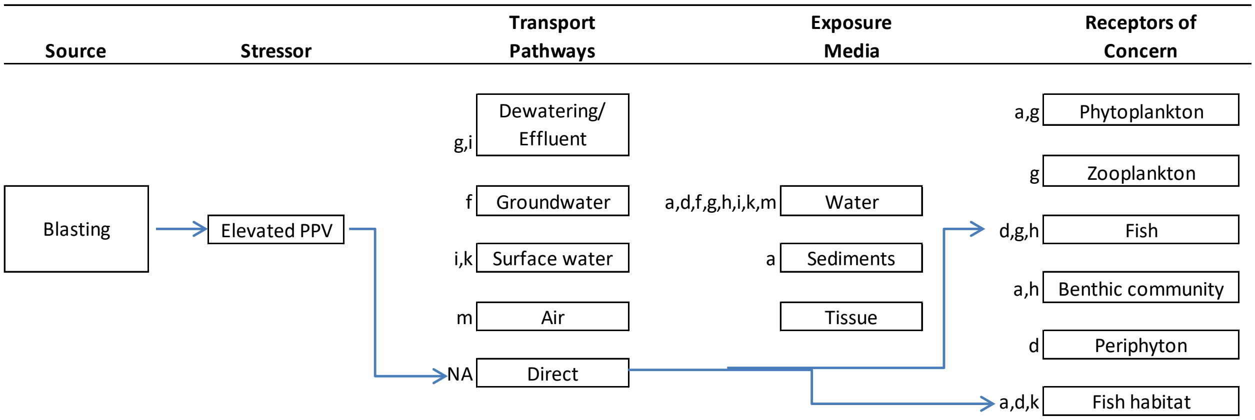
While some upward trends in nutrient concentrations were observed through the CREMP, these were predicted in the FEIS Addendum. As described in the 2020 CREMP Report, the ecological significance of the observed changes to primary productivity at WTS and MAM (see Section 8.12.4.2.2.1) will depend on how long these trends continue. Minor changes (e.g., changes in biomass that retain the general structure of the community and are relatively short-lived) are unlikely to be important ecologically, while larger or more extensive changes could start to change food chain dynamics in these typically low productivity lakes. However, these changes are predicted to result in a potential increase in fish abundance, rather than compounding negative impacts that could occur as a result of blast threshold exceedances.

Therefore, there are no changes to the assessment of potential impacts made in the Blast Monitoring Report (Appendix 41):

> As discussed in the 2011 report, Wright (1982) determined that peak particle velocity greater than 13 mm/s is potentially damaging to incubating eggs, however Faulkner et al. (2006), found no effects on lake trout eggs due to blasts at Diavik Mine, NWT with maximum PPVs of 28.5 mm/s. Faulkner et al. (2006) measured mean PPV at three exposure stations from September to July, 2003-2004 and found a mean range of 5.8 - 6.4 mm/s and reported 80 exceedances of 13 mm/s PPV at these stations with a maximum PPV being double the DFO guideline. They found there were no differences in mortality of lake trout eggs in incubators between exposure sites and reference sites that resulted from blasting at Diavik in 2003-2004. As a result, Agnico suggests that additional studies may not be necessary to confirm low PPV at spawning and incubation sites, since results of this study suggest impacts are likely not occurring even if no attenuation of PPV is occurring between blast monitoring sites and spawning habitat.

In all cases of exceedances, an assessment was completed and mitigation measures were implemented according to the approved Blast Monitoring Plan, which ultimately were effective. No supplemental management action is planned at this time.

Figure 26. Whale Tail site integrated conceptual site model for 2020 AEMP assessment of PPV exceedances.



Notes:

a	Core Receiving Environment Monitoring Program
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c	Dike Construction Monitoring
d	Fish Habitat Offsets Monitoring
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.

8.12.4.3 *Recommended Management Actions*

Since any potentially-mine related CREMP trigger exceedances were localized (near-field lakes), and no significant negative mine-related impacts to receptors of concern were identified or anticipated, no supplemental management actions are planned in 2021 for the Whale Tail site as a result of this assessment.

The following routine AEMP monitoring programs will occur.

- CREMP
  - Water quality – The full CREMP program (through-ice and open water) is planned at the NF, MF, and FF areas 2021. Through-ice limnological profiles are planned at MAM, WTS, and Nemo in the months when water sampling is not completed. In addition, contingency water samples may need to be collected during the limnology-only, through-ice sampling event(s), if anomalous in-situ limnology results are observed.
  - Phytoplankton – Routine sampling with the full water quality sampling program.
  - Sediment chemistry – Routine sediment grab chemistry sampling with the replicate benthos sampling stations in each area.

  - Benthos – Sampling at NF areas (WTS and MAM) to monitor for changes in the community due to construction and discharge. Sampling at NEM to monitor potential changes related to the temporary authorized discharge into the Nemo Lake watershed in 2019, and sampling at areas A20, A76 and DS1 to provide more information on the range of normal conditions to support future BACI-style analysis.

- Dike Construction and Dewatering Monitoring
  - Any required monitoring for dike construction or dewatering will follow the approved Plan.
- MDMER & Water Quality and Flow Monitoring
  - Monitoring will continue as per the monitoring plan, NWB Water License criteria, and MDMER requirements in 2021.
- EEM Biological Monitoring Studies
  - Cycle 1 EEM Biological Monitoring study report will be provided to regulators in July, 2021.
- Fish Habitat Offset Monitoring
  - No requirements for constructed habitat offset monitoring are anticipated for the Whale Tail site in 2021.
  - Pre-offsetting ecological monitoring to determine suitability of the flood zone as fish habitat is planned to occur as described in Section 8.8.2.2.
- Fish-out Monitoring
  - No fish-outs are planned for 2021 based on current mine plans.
- Blast Monitoring
  - Blast monitoring will continue in accordance with the Blast Monitoring Program (March, 2021).
- Groundwater Monitoring
  - Groundwater 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, 2020).

8.13 NOISE MONITORING

8.13.1 Meadowbank and Whale Tail Sites

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.***

And

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 2020 noise monitoring program at the Meadowbank Complex was conducted according to the Noise Monitoring and Abatement Plan (Version 4, December 2018). Complete results of the program are provided in Appendix 49 (2020 Noise Monitoring Report), and summarized below.

The objective of this program is to measure noise levels at 11 previously determined monitoring locations around the Meadowbank and Whale Tail sites, over at least two 24 h periods. Since high winds in the area tend to substantially reduce the quantity of available valid data, Agnico Eagle aims to conduct a minimum of two monitoring events of two to four days per station to fulfill monitoring objectives. In 2020, two monitoring events were successfully completed for all stations, except R10 where the noise meter was found to have fallen over after the second event, resulting in a voided survey.

After data processing in accordance with standard methods (Alberta Energy Resource Conservation Board Directive 038), monitoring results were compared to the site's daytime target sound level (55 dBA), nighttime target sound level (45 dBA), and FEIS predictions for the monitoring locations (24-h L_{eq}). Daytime, night-time, and 24 h L_{eq} values calculated from recorded 1-min L_{eq} values for each monitoring event and station are shown in Table 123. No exceedances of the target sound levels or FEIS predictions occurred for any station in 2020. Historical comparisons for Meadowbank area and Whale Tail Haul Road sites R1 – R7 indicate no clear trends towards increasing sound levels. Historical reviews for R8 – R11 in the Whale Tail area will begin in 2021 when two years of comparable results are available for these stations.

Impacts of sensory disturbance on wildlife are determined separately through the Terrestrial Ecosystem Monitoring Plan (TEMP), and reported annually in the Wildlife Summary Report.

Noise monitoring occurs annually, and will continue in 2021 according to the Noise Monitoring and Abatement Plan (Version 4, December 2018).

Table 8-123 Daytime, night-time, and 24-h L_{eq} values for monitoring locations R1 – R11. MBK = Meadowbank site, WTHR = Whale Tail Haul Road, WT = Whale Tail site. Day- and night-time periods with fewer than 3 hours of valid data due to weather conditions are excluded (-). The second monitoring event for R10 was invalid because the noise meter fell over (NS). *FEIS predictions are from Cumberland (2005) for the MBK site locations and Agnico Eagle (2018) for the WT/WTHR locations. **For R5, all 1 h L_{eq} values were below the FEIS prediction of 57 dBA.

Location	Station	Dates (M/D/2020)	FEIS Prediction*	Measured Values		
			$L_{eq, 24h}$ (dBA)	$L_{eq, day}$ dBA *(Target = 55 dBA)*	$L_{eq, night}$ dBA *(Target = 45 dBA)*	$L_{eq, 24 h}$ dBA
MBK	R1	07/10 – 07/13	58 - 63	39.7	31.5	35.5
		07/19 – 07/21		34.9	37.8	37.2
MBK	R2	06/30 – 07/02	58 - 63	30.7	33.8	32.0
		08/14 – 08/16		24.2	-	-
MBK	R3	08/04 – 08/06	49 - 53	32.8	34.6	34.0
		08/22 – 08/25		40.6	34.7	39.4
MBK	R4	07/27 – 07/29	58 - 63	35.3	33.6	34.3
		08/17 – 08/20		31.6	33.1	32.1
MBK	R5	08/09 – 08/11	(1 h L_{eqs} < 57)**	41.1	30.5	39.4
		08/25 – 08/28		-	-	-
WTHR	R6	07/04 – 07/06	40.5 - 42.5	28.8	36.6	33.1
		08/21 – 08/25		26.5	30.5	28.2
WTHR	R7	07/01 – 07/04	36.2 - 40.4	33.0	38.8	36.8
		08/04 – 08/05		-	34.6	-
WT	R8	07/16 – 07/19	36.2 – 40.4	-	27.4	-
		08/08 – 08/11		33.1	32.5	32.8
WT	R9	07/10 – 07/13	40.4 - 45.1	39.7	31.5	35.5
		08/01 – 08/03		29.4	32.5	30.9
WT	R10	07/24 – 07/26	36.2 – 40.4	-	-	-
		08/12 – 08/15		NS	NS	NS
WT	R11	07/21 – 07/23	45.1 – 50.0	34.5	43.5	38.8
		08/17 – 08/19		35.9	23.9	34.7

8.14 AIR QUALITY MONITORING

The 2020 air quality and dustfall monitoring program at the Meadowbank Complex was conducted according to the Air Quality and Dustfall Monitoring Plan, Version 5 (March, 2020). 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, All-Weather Access Road (AWAR), and Whale Tail Haul Road (WTHR).

Results obtained for the measured parameters in 2020 were primarily compared to Government of Nunavut (GN) Environmental Guidelines for Ambient Air Quality (October, 2011) and/or Canadian Ambient Air Quality Standards (CAAQS) for TSP, $PM_{2.5}$ and NO_2; BC Air Quality Objectives (August,

2013) for PM_{10}; Alberta Ambient Air Quality Guidelines (August, 2013) for passive dustfall, and to model predictions from the Project's Final Environmental Impact Statement Addendum (Whale Tail site only). Results for AWAR and WTHR dustfall monitoring are also compared to thresholds for supplemental mitigation established in the Air Quality and Dustfall Monitoring Plan, Version 5 (March, 2020).

For all monitoring stations, 24-h regulatory standards for suspended particulate matter and 30-d dustfall thresholds were met in the vast majority of samples. No exceedances of annual average standards occurred (TSP, $PM_{2.5}$, and NO_2), and no exceedances of available FEIS Addendum model predictions occurred for any parameter.

The complete report is provided as Appendix 46, and results are summarized below for the Meadowbank site, AWAR, Whale Tail site, and Whale Tail Haul Road, along with a summary of road dust mitigation for each area.

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*

Dust mitigation for the Meadowbank site was carried out in 2020 according to the Air Quality and Dustfall Monitoring Plan (Version 5, March 2020). Mine site roads watering was conducted regularly, as required during frost-free season (May to October). For Meadowbank, the volume of water use for this activity is not recorded as the water tank is the same as the one used by the mill, and thus no distinction is possible.

For the Meadowbank site, the vast majority of suspended particulate measurements in 2020 were well below regulatory guidelines for both monitoring stations (DF-1 and DF-2). The GN 24-h standard of 120 $\mu g/m^3$ for TSP was met in 109 of 112 samples, and the BC Air Quality Objective of 50 $\mu g/m^3$ for 24-h average PM_{10} was met in 106 of 107 samples. For $PM_{2.5}$, the GN guideline of 30 $\mu g/m^3$ for the 24-h average and the 2020 CAAQS of 27 $\mu g/m^3$ for the 24-h average was met in all (106) samples. No exceedances of GN or CAAQS guidelines for the annual average (TSP, $PM_{2.5}$) occurred.

For onsite dustfall monitoring locations (DF-1 – DF-4), the total dustfall monitoring threshold of 1.58 $mg/cm^2/30d$ (which is equivalent to the Alberta guideline for industrial/commercial areas) was met in 43 of 44 samples. However, the fixed dusfall result (the non-combustible fraction, more representative of road-related or inorganic dust sources) for the single elevated sample was well below the threshold, and represented only 3% of total dustfall. All other total dustfall results at this station (DF-2) were well below the threshold, with a maximum of 0.68 mg/cm^2/30-day. This sample is therefore considered an outlier and no change in mitigation is planned based on this result.

Neither the GN annual average standard for NO_2 of 32 ppb nor the 2020 CAAQS of 17 ppb was exceeded at either monitoring location (DF-1, DF-2) on the Meadowbank site.

Estimated greenhouse gas emissions for the Meadowbank Complex in 2020 for reporting to Environment Canada's Greenhouse Gas Emissions Reporting Program were 225,435 tonnes CO_2 equivalent, which is similar to values reported in recent years. This included emissions from Whale Tail site.

As described in the Air Quality and Dustfall Monitoring Plan (Version 5, March 2020), Agnico records community concerns that are raised with regards to dust generated by traffic on the AWAR and Whale Tail Haul Road. In 2020, no specific comments or complaints were received on this topic by the Meadowbank Environment Department. In response to the NIRB's 2019-2020 Recommendations, Agnico Eagle will assess the development of a community based monitoring program. Agnico would first like to have a meeting with the Baker Lake Hunters and Trappers Organization and Hamlet of Baker Lake to hear about their concerns, if any. A specific action plan will be established following this first meeting and communicated to NIRB via subsequent annual report.

Incinerator stack testing was not performed in 2020. This program will resume in 2021 on an annual basis, as described in Agnico's response to the NIRB's 2019-2020 Annual Monitoring Report for the Meadowbank Gold Project and the Whale Tail Pit Project (sent February 3rd , 2021) and Section XX above.

Overall, there are no apparent trends towards increasing air quality concerns at the Meadowbank site.

8.14.1.2 *AWAR Dustfall Monitoring*

According to the Air Quality and Dustfall Monitoring Plan (Version 5, March 2020), a calcium chloride dust suppressant was planned to be applied twice during the summer season on five sections of the AWAR, two locations in Baker Lake, and one onsite location. Between June 29th and July 4th, 2020, dust suppressant in the form of calcium chloride (dry flake product) was applied to nine sections of the AWAR, as well as two locations in the hamlet of Baker Lake, and one area onsite. Locations are described in Table 8-124, and have been generally consistent since this program began in 2017. Changes to dust suppression locations in 2020 compared to the Air Quality and Dustfal Monitoring Plan are indicated in Table 8-124. Some changes occurred due to restrictions related to COVID-19, and some based on field observations. No additional applications of dust suppressant were conducted along the AWAR, because the first application continued to be effective throughout the season, based on visual observations.

Table 8-124 Dust suppressant locations along the Meadowbank AWAR in 2020. Strikethrough indicates location where dust suppressant application was identified in the Air Quality Monitoring Plan (Version 5), but no application was completed in 2020. Italics indicate supplemental dust suppression locations in 2020.

Location Type	Dust Suppression Location	Rationale
Hamlet	Agnico Eagle spud barge area	High traffic area near hamlet
~~Hamlet~~	~~Agnico Eagle tank farm to Arctic Fuel site~~	~~High traffic area near hamlet~~ (not applied in 2020 due to COVID restrictions)
AWAR	km 3 – Baker Lake	High traffic area near hamlet
AWAR	km 10 - 12	High traffic area near hamlet & area of concern to HTO – proximity to lake
AWAR	km 24 - 26	Area of concern to HTO – proximity to lake
AWAR	km 48 - 50	Area of concern to HTO – water crossing
AWAR	km 68 - 70	Location identified by Agnico Eagle – water crossing
AWAR	*km 72.5 – 73.5*	*New 2020 (safety consideration)*
AWAR	km 80 - 84	Location identified by Agnico Eagle – proximity to water & crossing
AWAR	km 85 - 86	*New 2020 (safety consideration)*
AWAR	km 91 - 94	*New 2020 (safety consideration)*
AWAR	km 97 - 98	High traffic area near site
Onsite	Emulsion plant turn off to Meadowbank site (km 103 – 106)	High traffic area onsite

In 2020, dustfall monitoring was conducted along the AWAR in July and August for 2-km transects centered on the road in locations without dust suppression (km 18, km 78), according to the Air Quality and Dustfall Monitoring Plan (Version 5, March 2020). Results are compared to the monitoring threshold of 0.53 mg/cm^2/30d at 500 m, established in the Plan to assess the effectiveness of dust suppression efforts and determine the need for supplemental mitigation.

For both AWAR transects, all measured rates of dustfall declined below the threshold of 0.53 mg/cm^2/30d by 500 m, and in most cases, within 100 m. Based on these results, dust mitigation is considered to have been effective in maintaining particulate emissions below the established threshold values.

The majority of dustfall monitoring in 2020 was conducted on stands at 1.8 m (rather than at ground level as done previously) in response to ECCC comments during the Whale Tail permitting process. However, two transects (km 78 along the AWAR and km 169 along the WTHR) were also sampled at ground level in response to NIRB recommendations. Results of this comparison continue to indicate that ground-level samples provide a conservatively high estimate of dust deposition. Nevertheless, Agnico will conduct all future monitoring for dustfall on stands in accordance with standard methods, and for improved comparison of results with regulatory guidelines and FEIS predictions. Ground-level samplers will not be deployed in 2021.

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) ***The Proponent shall ensure continuous NO2 monitoring is undertaken downwind of mining activities to allow for comparison to relevant standards including the Canadian Ambient Air Quality Standards;***

d) ***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***

e) ***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 *Onsite Air Quality and Dustfall Monitoring*

Dust mitigation for the Whale Tail site was carried out in 2020 according to the Air Quality and Dustfall Monitoring Plan (Version 5, March 2020). Road watering was conducted regularly for roads on the Whale Tail site between July 2 and August 10, with a total of 17,700 m^3 applied.

Monitoring of suspended particulates using Partisol instruments began in April, 2020 at location DF-6b. Similar to results for the Meadowbank site location, the vast majority of results were below regulatory standards. Among all suspended particulate samples (30 for TSP, 31 for PM_{10} and 30 for $PM_{2.5}$), one sample exceeded the relevant 24-h standard (TSP on May 10 at 227 ug/m^3). However, concentrations of TSP above the GN guideline of 120 ug/m^3 were predicted for this location in the Project FEIS Addendum. FEIS Addendum predictions also indicated that maximum PM_{10} concentrations would exceed the BC 24-h standard of 50 µg/m^3 at DF-6b, which did not occur in 2020, nor did any exceedance of model predictions for $PM_{2.5}$ occur for this location. No exceedances of regulatory guidelines for the annual average of suspended particulate concentrations occurred.

Dustfall at DF-6a was monitored throughout the year using 30-d passive canisters, and the established threshold of 1.58 mg/cm^2/30d for total dustfall was met in all cases.

In addition NO_2 was measured year-round at DF-6a using passive samplers. Neither the GN annual average standard for NO_2 of 32 ppb nor the 2020 CAAQS of 17 ppb was exceeded. Results were also below the maximum FEIS Addendum model-predicted annual average of 8 – 16 ppb. A continuous active NO_2 monitor will be installed in 2021 in consultation with ECCC.

In response to ECCC concerns, Agnico held a call on March 16th, 2021 to discuss the proposed location of the NO2 continuous monitoring station along the WTHR at km 132. During this call, Agnico explained the rationale for choosing this location and also confirmed to ECCC that comparison of the monitoring results to the CAAQs and FEIS modelling predictions will be possible and are actually aligned with the requirements of the Project Certificate. Agnico also committed to adding a passive monitoring station along with the continuous NO2 station. Based on this discussion, ECCC was in agreement with the proposed location at km 132. Agnico considers this concern resolved and will pursue with the installation and commissioning of the station at this location in 2021.

Overall, there are no apparent trends towards increasing or unpredicted air quality concerns at the Whale Tail site

8.14.2.2 *Whale Tail Haul Road Dustfall Monitoring and Mitigation*

According to the Air Quality and Dustfall Monitoring Plan (Version 5, March 2020) the use of chemical dust suppressants for the Whale Tail Haul Road was planned only as a last resort. Management primarily consists of enforcing speed limits, grading, placement of new material, and if necessary, road watering or application of dust suppressants. The implementation of dust mitigation measures is determined by the Road Supervisor and Environment Department based on visibility concerns, or where dust deposition is potentially impacting traditional land uses, fish habitat, and/or water quality.

In 2020, dust suppressant in the form of calcium chloride (dry flake product) was applied to the entire length of the WTHR in mid-June. In addition, road watering was conducted along the entire WTHR throughout the summer season, as required.

Dustfall monitoring in 2020 consisted of passive sampling over two 30-d periods during July and August for 2-km transects centered on the road at km 134, km 156, and km 169. Results are compared to the threshold of 0.53 mg/cm^2/30d at 500 m, established in the Air Quality and Dustfall Monitoring Plan (Version 5, March 2020) to assess the effectiveness of dust suppression efforts and determine the need for supplemental mitigation. This threshold is equivalent to the general FEIS Addendum prediction for dust deposition along the WTHR.

For all three transects, no exceedances of the dust monitoring threshold occurred. In all cases, results for total dustfall fell below 0.53 mg/cm^2/30d within 100 m of the road. Based on these results, dust mitigation is considered to have been effective in maintaining particulate emissions below the FEIS Addendum predictions and established threshold values.

No community concerns related to operational dust levels along the Whale Tail Haul Road have been received to date.

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 over the years 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
- Use of solar panel in 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 a composter at Meadowbank
- Genset Synchro R&D test on Gen 47 for future installation at the Whale Tail Power Plant. Expected fuel consumption decrease
- Whale Tail Camp Power Plant and Whale Tail underground Power Plant heat recovery study
- Insulation of remote buildings at Meadowbank
- Audit and initiate projects to improve the heat recovery from generators boiler and the distribution

The Greenhouse Gas Reduction Plan (Version 3, April 2020) 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 (GHGRP) was submitted as Version 3 in April, 2020, and results of GHG emissions calculations are reported here according to Section 3.2 of the Plan, with comparisons to FEIS predictions.

As part of the FEIS Addendum for the Whale Tail Pit Expansion Project (Agnico Eagle, 2018), Project-related emissions of GHGs were calculated using methods consistent with the GHGRP. Table 8-125 summarizes predictions of GHG emissions for the Meadowbank and Whale Tail Project for the peak year of production in 2022. Emissions associated with the Meadowbank Mill were calculated in the FEIS for Whale Tail Pit (Agnico Eagle, 2016), and are shown as a separate line item in Table 8-125. These values are consistent with Table 2.1 in the GHG Reduction Plan (April, 2020).

Table 8-125 Predicted Greenhouse Gas Emissions summary for the Whale Tail Expansion Project in the peak production year of 2022 (from Agnico Eagle, 2018) and the Meadowbank Mill (from Agnico Eagle, 2016)

Emissions Source	Greenhouse Gas Emissions (kt CO_2)
Non-road Exhaust	142.0
Generators	18.0
Heaters	1.9
Incinerator	2.3
Whale Tail Expansion Project Total	**164.2**
Meadowbank Mill	180.0
Meadowbank Complex Total	**344.2**

Calculated annual GHG emissions for the Meadowbank and Whale Tail sites beginning in 2018 (first year of Whale Tail reporting) are provided in Table 8-126, with comparisons to FEIS predictions. Calculated emissions beginning in 2019 include both Whale Tail and Meadowbank sources combined, so only the total values are compared to FEIS predictions in Table 8-126. As described in the GHG Reduction Plan (April, 2020) and Table 8-125 above, FEIS Addendum predictions were developed for the maximum emission scenario (i.e. peak production; estimated to occur in 2022).

Overall, total emissions from the Meadowbank Complex (Meadowbank and Whale Tail sites) were 225,435 tCO_2e in 2020, which is less than the FEIS-predicted maximum value of 344,200 tCO_2e.

Table 8-126 Predicted and calculated GHG emissions (t CO_2e) for all sources required under the Greenhouse Gas Pollution Pricing Act (S.C. 2018, c.12,s.186, Schedule 3) for the Meadowbank Complex. FEIS Predictions are further described in Table 8-125 above.

Emission Type	FEIS Prediction	2018	2019	2020
Electricity Generation - stationary fuel combustion emissions (Generators)	-	91,082	106,499	106,251
Electricity Generation - Stationary fuel combustion emissions (Other than generators)	-	-	577	266
Industrial process emissions	-	987	560	1,138
Industrial product use emissions	-	-	527	986
Venting emissions	-	-	-	-
Flaring emissions	-	-	-	-
Leakage emissions	-	-	-	-
On-site transportation emissions	-	90,650	82,951	113,609
Waste emissions	-	2,809	4,450	3,186
Wastewater emissions	-	-	-	-
TOTAL	344,200	185,528^	195,564*	225,435
^In 2020, calculation methods were revised for 2019+. **Re-calculated in 2020. Previously reported in 2019 as 194,500.*				

Calculated total monthly emissions for all sources required under the Greenhouse Gas Pollution Pricing Act (S.C. 2018, c.12,s.186, Schedule 3), for both the Whale Tail and Meadowbank sites are shown in Figures 27 and 28, grouped by major and minor sources. Relatively little variation in sources of emissions occurred month over month (Figure 28), though emissions overall do appear to increase in the winter months (Figure 27), likely due to heating requirements.

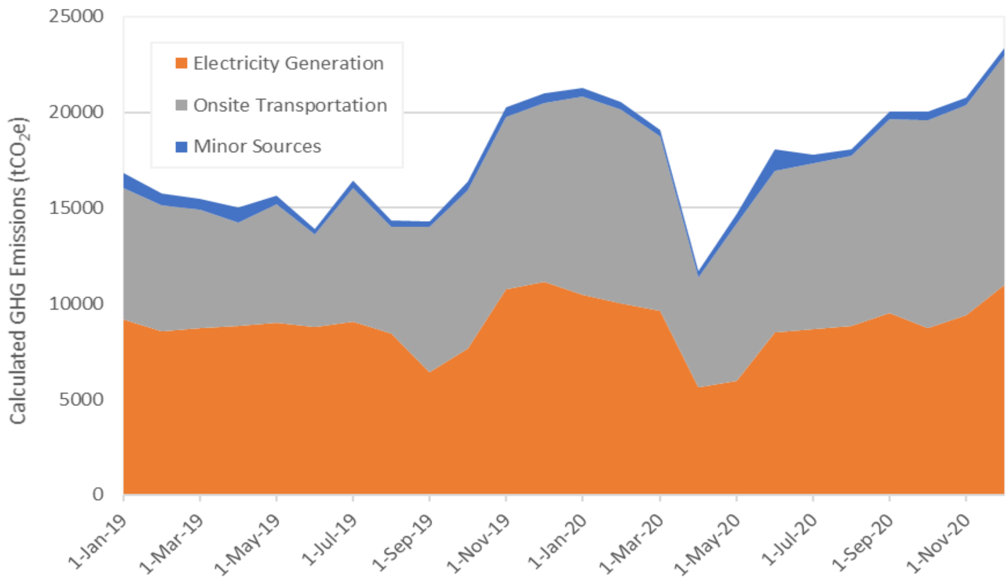


Figure 27. Calculated monthly GHG emissions for the Meadowbank Complex. Minor sources include emissions related to stationary combustion, industrial processes, industrial product use, and waste emissions.

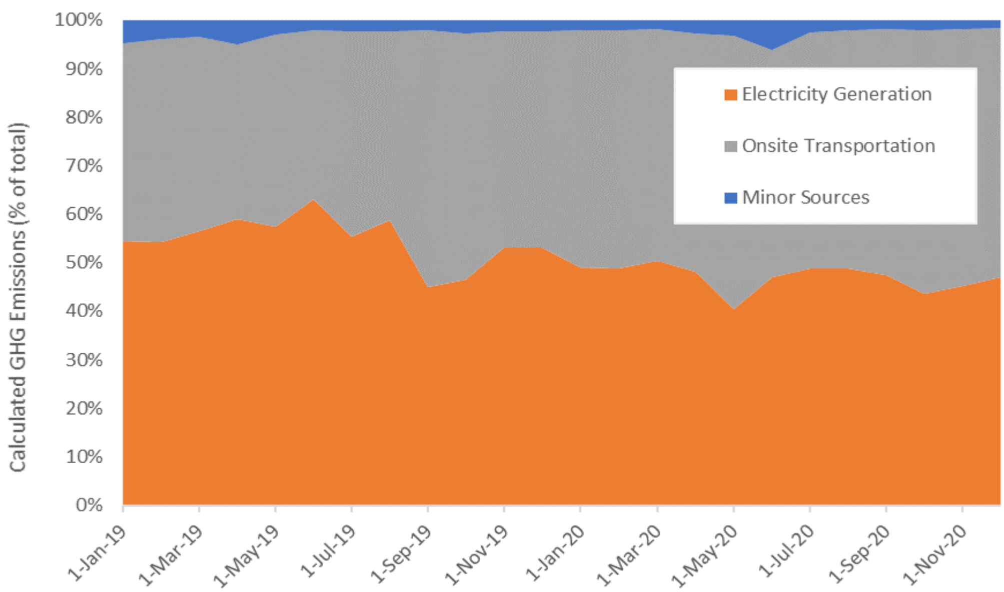


Figure 28. Calculated monthly GHG emissions (% of total) for the Meadowbank Complex. Minor sources include emissions related to stationary combustion, industrial processes, industrial product use, and waste emissions.

According to the GHGRP (Section 3.2), an analysis of specific sources is provided in Figure 29. These sources include aviation, blasting, propane heating, and light truck transportation using gasoline. It is noted that aviation emissions exclude aviation fuel for flights to Nunavut, which are not subject to carbon pollution pricing (https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/putting-price-on-carbon-pollution.html). Reported aviation fuel use is therefore primarily associated with helicopter use for exploration activities and personnel transport during the summer months. Use in 2020 increased compared to 2019 as a result of the COVID-19 pandemic and the use of helicopters for daily personnel transport to Baker Lake in lieu of in-town accommodation. Emissions related to blasting have steadily increased over the course of 2019 and 2020 as Whale Tail operations ramp up. Propane heaters form a very minor component of overall emissions and have been relatively constant (0.4 – 2.0 tons CO_2e/month). Similarly, use of gasoline for transportation (primarily associated with light trucks, but also potentially smaller vehicles such as ATVs and snowmobiles) has remained relatively constant, though a slight increase during the winter season of 2019-2020 was observed, potentially related to decreased use of helicopters during this time.

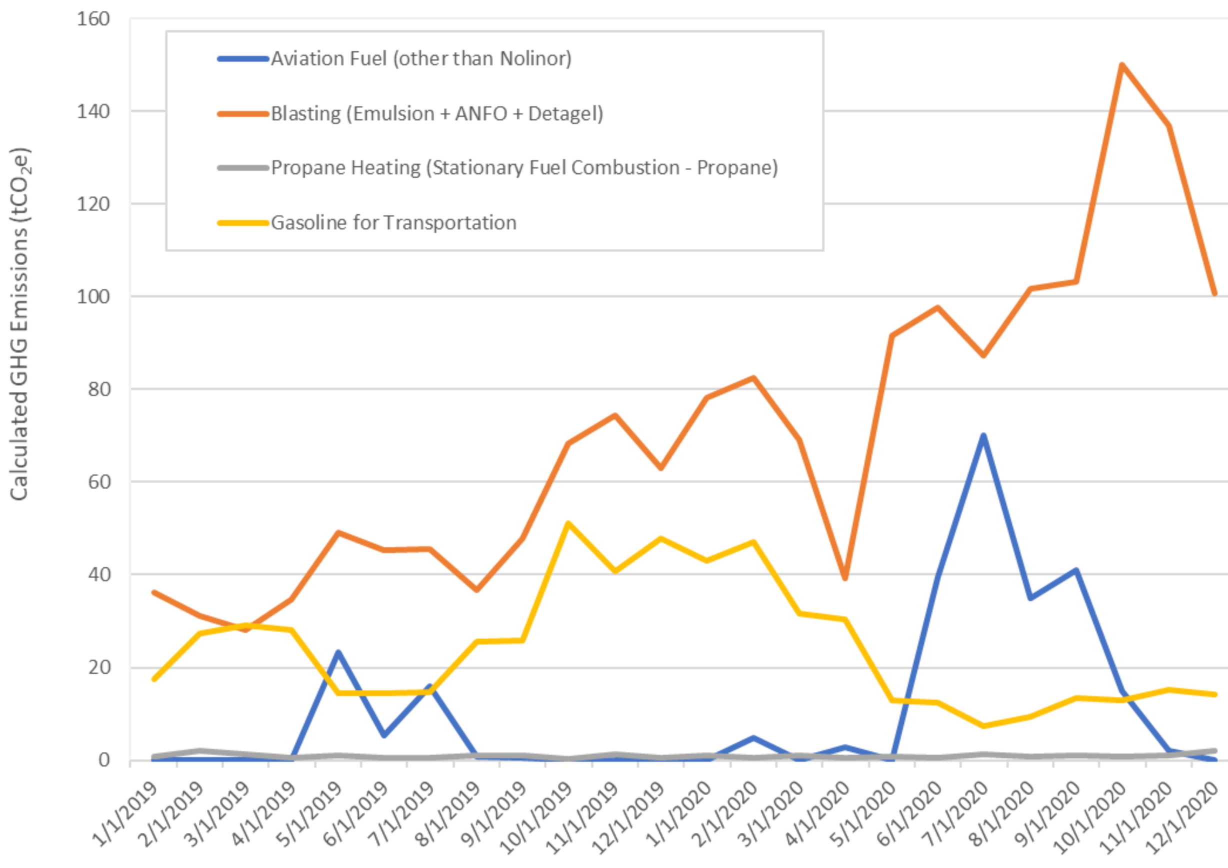


Figure 29. Calculated emissions related to specific sources in 2019 and 2020 as indicated in the GHGRP (April, 2020; Section 3.2).

Agnico is continually seeking to reduce GHG emissions. Greenhouse gas emission reduction programs are identified in Section 8.15.1 above, and further described in the GHG Reduction Plan (April, 2020). Some have already been implemented, while others are currently being assessed.

As Agnico emitted more than 50Kt per year of $CO2_e$/yr for the combined Meadowbank and Whale Tail site, a report will be submitted to Environment and Climate Change Canada's Greenhouse Gas Emission Reporting Program by June 1st, 2021. Mining operations in Nunavut are also subject to the federal Output Based Pricing System Regulations, which came into effect July 1st, 2019. An Annual Report and supporting Verification Reports, required as part of the OBPS, will be submitted on June 1st, 2021. These reports are in addition to GHGRP reporting. It should be noted that due to differences in calculation methods, total emissions reported under ECCC's Greenhouse Gas Reporting Program (or other regulatory programs) may differ slightly from those provided here for the purposes of comparison with FEIS predictions.

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.

After low participation during the first year of the study, methods were strategically adapted, participation increased steadily, and valuable information on harvest patterns in the Baker Lake area was collected. The HHS, through regular visits, contributed to developing a strong relationship with local harvesters, the HTO, and GN DoE. Data were provided annually in monitoring reports from 2007 to 2015. The HHS was suspended for three years (2016 and 2018) to develop new approaches and direction.

Following consultation with the HTO, KivIA, GN, and other agencies in November 2016 (Winnipeg) and June 2017 (Ottawa), Agnico Eagle reinitiated the HHS in March 2019. The study approach was similar to previous years but suggestions and guidance received during the consultation period were incorporated into the study.

Completed discussion regarding creel survey and historic data is provided in Section 10 of the 2020 Wildlife Monitoring Report (Appendix 47). The below is a summary of the findings and Agnico will refer to Appendix 47 for a complete discussion of the results.

Harvest calendars are provided on a household basis rather than an individual basis in order to simplify data entry and collection. The harvest calendar is attractive and consists of local photographs of wildlife and Baker Lake residents (see Appendix A for 2020 calendar – Appendix 47 of this report). Space is provided for each calendar day where harvest details can be documented. A map is provided at the end of the calendar that delineates a 4 km^2 UTM grid within the Baker Lake and Meadowbank areas. Each grid has a unique code to facilitate recording of information. When calendars are issued, participants or participating households are encouraged to write harvest details (e.g., number of animals, sex, age and location [i.e., grid code]) for the appropriate date on the calendar.

Participants were interviewed in person only two times during the year (i.e., October 2020 and February 2021) by the harvest study coordinator. The lower number of visits in 2020 reflects logistical issues associated with Covid-19 (e.g., a mandatory 14-day quarantine was required in Winnipeg prior to travelling to Baker Lake). During the February 2021 interviews, remaining data from 2020 were collected. The purpose of the interviews is to ensure all harvest data are recorded on the calendars and collect incidental information to compliment calendar data, including notable Caribou movements, aggregations, and unique observations. Between interview periods, participants were often contacted by phone or social media to encourage recording of harvest data.

Features of the 2020 Hunter Harvest Study included: 1) increasing the amount of time researchers spent in the community interacting with participants on each visit; 2) building long-term relationships between participants and researchers; 3) increasing engagement with participants on social media platforms such as Facebook and Instagram; and 4) increasing incentives for participating in the study (e.g., gas vouchers and prizes).

The number of fisherman reporting successful fishing trips in 2020 was 21, which is lower than the average of 23 fisherman from 2007 to 2015 and in 2019 (10 years), and lower than the 26 fisherman reporting success in 2019.

Three fish species were reported as being caught in 2020: Arctic Char, Lake Trout and Lake Whitefish. The most common fish species captured, Lake Trout, represented 67% of the total catch in 2020, which was higher than the average of 55% from 2007 to 2015 and in 2019. In 2019 interviews, some fisherman indicated that Lake Whitefish numbers in Baker Lake were particularly high in 2019. Lower numbers of Lake Whitefish caught in 2020 could be due to lower abundance and/or reduced fishing effort.

Fishing trips, regardless of success rate, did not generally occur beyond the immediate areas of Baker Lake, Whitehills Lake, and along the AWAR. Some fishing occurred along the Thelon River system and associated lakes during the summer when these areas can be accessed by boat. Results indicate that study participants are less willing to travel long distances to catch fish, regardless of AWAR access, likely due to the abundance of fish in close proximity to the Hamlet of Baker Lake.

In 2020, fishing periods with the most active fisherman was from May to August. The periods with the most fish caught included the summer months (especially June and July), which reflects the high number of Lake Trout caught by fisherman heading out on the land after ice melt. This trend can be observed in the overall trends from 2007 to 2015 and 2019; however, the winter peaks of fishing observed in 2019 were not seen in 2020.

The 2020 HHS data were compared to the impact prediction thresholds to evaluate adherence to the impact predictions and the provision of adaptive management, as either a necessary or proactive measure. No thresholds were surpassed in 2020 (Section 8 of Appendix 47).

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 2020.

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 including details of how Inuit Qaujimajatuqangit contributed by knowledge holders has been considered and utilized in associated activities and updates.***

Agnico submitted the TEMP Version 7 in June 2019 (Appendix 58 of the 2019 Annual Report). This version includes revision per additional comments from TAG members, and Whale Tail Expansion Project environmental assessment information requests, technical comments, and technical meetings.. This section include both Meadowbank and Whale Tail site, as condition from Project Certificate no. 004 and 008. TEMP Version 8 was submitted in 2020 within 60 days of issuance of the amended Project Certificate No.008 to comply with commitments made during the Expansion Project NIRB Review Process. This Version 8 is still discussed with the TAG and Version 7 of the TEMP continued as the basis for 2020 monitoring and mitigation

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 2020 Wildlife Monitoring Summary Report represents the 15th 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 2020. The complete report presenting the whole program and complete analysis of the result is presented in Appendix 47. 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 7, 2019). The 2020 report provides the objectives, methodology, historical and current year results, and management recommendations for each monitoring program. The 2020 Wildlife Monitoring Summary Report builds on data presented in previous reports and incorporates monitoring recommendations from these reports. Below is a summary of the major activities in 2020 with more details provided in following sections.

The Government of Nunavut's Caribou (*Rangifer tarandus*) collaring program, ongoing for the past 13 years in the Baker Lake area, continued in 2020 with monitoring of existing collared animals and is expected to continue through 2021. Seven deployments, with a total of 115 collars, have been completed

* TSM- Biodiversity and Conservation Management

in the area around Baker Lake since Agnico Eagle became involved in the collaring program. Agnico Eagle requested access to 2020 collared caribou data on October 27, 2020. The data had not been received at the time of publication of this report.

A Hunter Harvest Study (HHS) conducted from 2007 to 2015 was relaunched in March 2019. In 2020, the study included more than 60 participants of which 43 reported harvesting Caribou. Given an estimated 300 to 350 active hunters in the Hamlet of Baker Lake, the HHS represents from 12 to 14% of hunters in the community. With a total reported Caribou harvest of 652, the total Caribou harvest in Baker Lake is estimated to range from 4,657 to 5,433 Caribou. This estimate is likely high because the current study attracted some of the more successful hunters (e.g., Baker Lake Hunters and Trappers Organization members) in the community.

Six active Peregrine Falcon (*Falco peregrinus*) nests were observed and monitored at quarry sites along the AWAR in 2020. No nest were observed on the WTHR or Whale Tail Mine site. Raptor nest management plans were not required at any of the active nest sites along the Meadowbank All-Weather Access Road, the Whale Tail Haul Road, or the Whale Tail Pit area since no project-related effects on raptor nesting success were observed and mine-related activities were restricted around sites.

In 2020, 132 road surveys were conducted along the AWAR and 161 were conducted along the WTHR. A total of 43,244 caribou were observed along the AWAR (327.6 caribou per survey) and 17,172 caribou were detected along the WTHR (106.7 caribou per survey). Road surveys helped facilitate mitigation decisions along the AWAR and WTHR.

Numerous road closures were implemented on all project roads to ensure safe passage to large groups of migrating Caribou herds. Traffic along the AWAR was restricted for a total of 59 days in 2020, and traffic along the WTHR was restricted for a total of 16 days.

The viewshed surveys implemented in 2020 are to act as an early-warning system for caribou approaching the WTHR. A total of 163 surveys were conducted in 2020, primarily in the summer (57%) and winter (20%) months. Caribou were observed on just 10 surveys, 80% of which were during the spring. A total of 252 caribou were recorded from the 2020 viewshed surveys.

In 2020, the remote camera program detected caribou crossing at three locations on the WTHR. The limited number of caribou crossing events from the remote camera program in 2020 do not allow statistical analysis of the relationship between caribou crossing events, road parameters, and vehicle traffic.

The 2020 blast monitoring program was limited due to COVID-19. Blasting measurements were collected in December 2020 at two locations in the vicinity of the Whale Tail Pit, and caribou behavior was monitored in relation to blasts throughout 2020. Blasting was cancelled on a single occasion due to caribou presence in the vicinity of the Whale Tail Pit.

A pilot snow study was implemented in 2020 to evaluate the effectiveness of the survey techniques and to guide future monitoring activities. Year two monitoring planned for 2021 should aim to collect a full suite of data (i.e., six plots sampled) from at least ten survey locations along the WTHR in 2021.

Agnico Eagle also initiated a pilot study of caribou behavior data collection that focused on measuring different behavior activities of caribou in relation to mine-related activities (Appendix H of Wildlife Summary Report). The results of the program will be reviewed with the TAG.

In 2020, one caribou, two wolverines and four artic fox mine-related mortalities occurred. 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 “2020 Wildlife Monitoring Summary Report” attached in Appendix 47.

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 (Section 8.16 above).

After low participation during the first year of the study, methods were strategically adapted, participation increased steadily, and valuable information on harvest patterns in the Baker Lake area was collected. The HHS, through regular visits, contributed to developing a strong relationship with local harvesters, the HTO, and GN DoE. Data were provided annually in monitoring reports from 2007 to 2015. The HHS was suspended for three years (2016 and 2018) to develop new approaches and direction.

Following consultation with the HTO, KivIA, GN, and other agencies in November 2016 (Winnipeg) and June 2017 (Ottawa), Agnico Eagle reinitiated the HHS in March 2019. The study approach was similar to previous years but suggestions and guidance received during the consultation period were incorporated into the study.

Refer to Creel Survey Section 8.16 above for the 2020 methodology employed.

The HHS included 64 participants by the end of 2020. Of these, Caribou harvest data had been collected from 43 participants, which is considerably higher than the 28 participants that reported Caribou harvests in 2015, and slightly higher than the 42 hunters reporting harvests in 2019.

Based on the previous discussion of total numbers of hunters in the Hamlet of Baker Lake, there were 389 potential hunters within the Baker Lake community in 2008. The number is comparable to the comprehensive 5-year Nunavut Wildlife Harvest Study (NWMB 2005) in which 336 Baker Lake hunters were contacted and interviewed. Discussions with Baker Lake HTO members in 2019 suggest the total number of hunters is over 300. Given the historical and current number of hunters in Baker Lake, an estimate of 300 to 350 active hunters is used in this analysis. Based on these numbers, the 43 hunters reporting Caribou harvest in 2020 conservatively represent from 12 to 14 % of total hunters in the community.

Hunting is concentrated along the northern and southwestern ends of Baker Lake and along the AWAR to approximately KM 85. Limited harvests were reported along the Thelon River system in the vicinity of Schultz and Aberdeen lakes, and along the Kazan River near its mouth on Baker Lake. Annual variation in harvest location and intensity is attributable to numerous factors. For instance, many hunters have stated during informal discussions that they have a ‘favorite’ hunting area that they frequent each year. Some hunters have stated that they prefer hunting in ‘convenient’ locations, whereas other hunters prefer remote locations well away from frequented areas. A percentage of hunters also enjoyed partaking in long distance hunting trips over multiple days.

Between 1996 and 2001, 18% of Caribou harvests were estimated to be within 5 km of the AWAR (prior to construction) and 67% of harvests occurred within the RSA (NWMB 2005). In the first year of the HHS study (2007), prior to completion of the AWAR, 34% of harvests were reported within 5 km of the AWAR alignment and 79% were recorded within the RSA. The HHS data (2007 to 2015 and in 2019) fluctuated between 34 and 54% of reported harvest within 5 km of the AWAR, and between 64 and 85% within the RSA. The 2020 HHS data indicated that 30% of reported harvest occurred within 5 km of the AWAR, and 62% occurred within the RSA, representing the lowest proportion of Caribou harvested within 5 km of the AWAR since the road was built. One of the reasons for this may have been because of the large number of Caribou harvested in the vicinity of Baker Lake in fall 2020. As was the case in other years, threshold levels of 20% set for monitoring the effects of the Meadowbank mine development on the distribution of Caribou harvest were not exceeded

In 2020, a total of 652 Caribou were reported as being harvested by 43 participants. Given that the 43 hunters represent an estimated 12 to 14% of the Baker Lake hunting community, and assuming that the average number of Caribou shot per hunter is similar, the total estimated number of Caribou harvested in 2020 ranges from 4,657 to 5,433 animals, which is almost identical to estimates for 2019. This estimate is considered to be conservative (i.e., high) since the Baker Lake Hunter Harvest Study targeted known hunters in the community with some known to be particularly successful.

Based on the NWMB (2005) and HHS results (2007 to 2015; 2019 to 2020), highest Caribou harvests have occurred in September and October, with a second smaller peak in March and April. The similar pattern between the studies indicates that seasonal hunting preferences have not changed markedly in the last decade.

In spring, overall Caribou hunting was low with hunting occurring north of Baker Lake and along the Thelon River system. During the summer, Caribou were harvested across a larger area but particularly along the AWAR, just northeast of the Hamlet of Baker Lake, and in areas along Baker Lake accessible by boat. In the fall, hunting was much more concentrated along the AWAR and in the Baker Lake area. The large numbers harvested just northeast of Baker Lake in the fall reflects the large herd of Caribou that moved through the area in the fall. Some hunting in the fall also occurred along the Kazan River near Baker Lake. In winter, very few Caribou were hunted along the AWAR. Successful hunters were those that travelled further afield by snowmobile (e.g., southwest end of Baker Lake, and between Schulz and Aberdeen lakes).

There were no reported harvests for Muskox in 2020, precluding any interpretation of potential minerelated effects. Wolverines (total of 22 in 2020 – the highest yearly tally to date) were hunted close to Baker Lake, north of Aberdeen Lake and in other remote areas. Wolves (total of 88 in 2020) were either trapped close to Baker Lake or hunted in larger numbers north of Aberdeen Lake in winter. Relatively low densities of Wolves and their general aversion to humans requires hunters to hunt well away from the AWAR. The presence of the AWAR is thought to have little effect on participant hunting patterns for Muskox, Wolverine and Wolf.

Arctic Fox (total of 11 in 2020) was primarily trapped in the vicinity of Baker Lake and east of Whitehills Lake, while Red Fox were harvested near Baker Lake and south of Tehek Lake. Two Grizzly Bear were taken near Pitz Lake, while one was taken in the southeastern end of the study area. Birds (e.g., goose, duck, ptarmigan etc.) and their eggs were reported as being collected around Baker Lake and north of Princess Mary Lake.

The 2020 HHS data were compared to the impact prediction thresholds to evaluate adherence to the impact predictions and the provision of adaptive management, as either a necessary or proactive measure. No thresholds were surpassed in 2020. (Section 10.0 of the Appendix 47).

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 for minimizing flooding-related impacts to birds, Trent University, in collaboration with Environment and Climate Change Canada and Agnico Eagle, conducted active bird nest surveys and experimented with deterrent options in summer 2018 and 2019 at the Whale Tail site. A field program was not completed in 2020 due to COVID-19 restriction. Results of the 2018 and 2019 programs, and plans for future monitoring in 2021 are provided in the complete report 2020 Migratory Bird Protection Report found in Appendix E of the 2020 Wildlife Monitoring Report (Appendix 47) 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 15 of the 2020 Wildlife Monitoring Summary Report (Appendix 47) and previous year reports. 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.

In 2019, the Canadian Wildlife Service requested a detailed analysis of all PRISM and bird transect data to date and a comprehensive report outlining protocols and analytical results. If no effects are evident, bird monitoring can be shifted to: 1) PRISM plots randomly selected by CWS staff; and 2) a Breeding Bird Survey (BBS) as per standard BBS protocols. For 2020, it was agreed that a review and analysis of previous surveys would be completed to enable further discussions on the path forward on future surveys. On December 3rd, 2020 Agnico Eagle sent ECCC the comprehensive 2003-2015 analysis of all PRISM and breeding bird transect data. The analysis determined there were no significant effects of the Project or Mine-related infrastructure on bird abundance, diversity, or community composition. Pending approval, a new program to assist with regional monitoring efforts will be enforce in 2021.

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.

h. Details of a monitoring program, including recording the locations and frequency of observing caribou and carnivores and any actions taken to avoid contact with or disturbance, and a specific mitigation plan for Shortearred owls and any other species of special concern pursuant to Schedule 3 of the Species at Risk Act located in the local study area or along the all-weather private access road.

See “2020 Wildlife Monitoring Summary Report” attached in Appendix 47 for a completed discussion.

All Mine site personnel, including construction and support staff, are required to document and report wildlife observed within the LSA of the Project as well as ancillary areas (e.g., AWAR and WTHR). The protocol involves notifying staff in the environment department, which is intended to ensure that potential problem animals are identified. Pertinent data, and daily and weekly Mine site inspection reports are consolidated and entered into an electronic database. Monthly summary reports and wildlife observation data are submitted to the GN. Quarterly reports are submitted to the KIA.

In 2020, 132 road surveys were conducted along the AWAR and 161 were conducted along the WTHR. Seven mammalian species and seven avian species were detected and identified during road surveys in 2020. Arctic fox, Arctic ground squirrel, Arctic hare, caribou, grey wolf, muskox, and wolverine were all detected along both the AWAR and WTHR. Canada goose, sandhill crane, common raven, peregrine falcon, and snow goose were detected on both the AWAR and WTHR, and bald eagle and rough-legged hawk were detected along the AWAR. Five unidentified birds were observed during road surveys: eagle sp. (most likely bald eagle), duck sp., goose sp., ptarmigan sp., and swan sp. (most likely tundra swan).

The incidental wildlife forms were used consistently throughout 2020 to document wildlife seen around the Project. Total incidental wildlife observations were much higher in 2020 than previous years. Notable wildlife sightings in 2020 include a single pine marten, a single grizzly bear and a single red fox. Bird sightings throughout the year included bald eagle, peregrine falcon, rough-legged hawk, and snowy owl.

Refer to Section 8.18.6 below for a discussion regarding species at risk.

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.***

Agnico Eagle requested access to 2020 collared caribou data on October 27, 2020. The data had not been received at the time of publication of this report.

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 and Whale Tail RSAs, as per the Memorandum of Understanding (2017) 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. More details can be found in Section 5 of the 2020 Wildlife Monitoring Summary Report (Appendix 47).

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. Collar data has also been used to understand Mine-related effects.

The satellite-collaring program was developed to provide information on the distribution of Caribou occurring within the Meadowbank and Whale Tail RSAs and contribute data to ongoing satellite-collaring programs for the Ahiak, Qamanirjuaq, and other herds that are used by the GN for herd management. 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 2019 TEMP).

Agnico Eagle requested access to 2020 collared caribou data on October 27, 2020. The data had not been received at the time of publication of this report.

8.18.1.5 *Remote Cameras*

The initial remote camera study design (October 2018 to November 2019) was intended to collect general trends on caribou crossing events and traffic or road activities on the WTHR, to inform fine scale traffic mitigation. An updated study design was implemented in November 2019, to examine the permeability of the WTHR to caribou movement as those interactions relate to the physical parameters of the road. Results from the 2020 remote camera program are presented in Section 7 of the 2020 Wildlife Monitoring Summary Report (Appendix 47) and summarized below. Results from the 2019 remote camera program will be presented in a separate technical memo.

The primary objective of the remote camera program is to monitor caribou behavioural interactions with the WTHR, and adapt management practices (i.e., traffic mitigation) as required. The current remote camera program allows for comparisons to determine if caribou crossing locations along the WTHR are related to the physical parameters of the road (i.e., backfill height, slope and material grain size) and traffic rates.

The locations of the 16 paired remote cameras along the WTHR were selected based on high-frequency caribou crossing locations, and stratified across road height. Camera location are showed on Figure 11 of Appendix 47. Backfill material and slope at camera locations were determined from construction surveys.

A total of 133,268 motion triggered photographs and 35,398 timed photographs were collected within the sensitive period. Wildlife were documented in 490 photographs; the majority of remaining photographs were of vehicles or caused by wind. The average number of days cameras were active (i.e., able to collect photographs without obstructed field of view by ice or dust) was 49.0 ± 10.2 days (mean ± standard deviation), or 91% of 54 potential days in the spring. The average number of fall active days was 67.2 ± 15.4 days, or 80% of 84 potential days.

Caribou were detected in the spring season at four different camera pairs, and at one camera pair in the fall. Calm, neutral, and crossing behaviours were observed. No obvious deflection or stress related behaviours in relation to the road or traffic were observed, however there were instances where caribou would appear to remain in the vicinity of the road prior to crossing, or would appear curious of cameras.

Other species, or species groups, detected at cameras include Arctic hare, Arctic fox, muskox, wolverine, falcon sp. (most likely peregrine falcon), common raven (*Corvus corax*), and rock ptarmigan (*Lagopus muta*).

Crossing events were documented at camera pairs 1, 2, and 3. There were potential crossing events at camera pairs 4 in spring, and 6 in fall that could not be confirmed (i.e., photographs of caribou moving towards road, but not observed on or crossing roads). Camera pairs 1 and 2 are located at the highest road height category (>3 m), with 4:1 slope and rock backfill. Camera pair 3 is in the 1.5 to 3 m road height category, with rock backfill and 2:1 slope. All documented crossing events occurred on time lapse photographs, with the exception of the event at camera pair 3 on 5 Apr at 07:00 that was also captured on motion-triggered images. All crossing events were documented during road closures, with the exception of one event where speed was limited on a portion of the road away from the camera. The time between documented caribou crossing events and previous vehicle traffic ranged from 2:30 to 85:10 hours.

The limited number of caribou crossing events from the remote camera program do not allow statistical analysis of the relationship between caribou crossing events, road parameters, and vehicle traffic. The amount of time since last vehicle passed is shorter when the WTHR is open than closed, which suggests that caribou are not responding immediately to WTHR closures. These inferences are preliminary given the limited number of cameras, camera locations and crossing events. Increasing camera effort would be an approach to increase the number of crossing events observed. Fine scale analysis of caribou behaviour in relation to vehicle traffic was not possible at this time because all crossing events, with the exception of one, occurred during road closures. Differences in caribou detections and crossing events across cameras may be related to differences in camera field of view, and number of active days. Analysis of data from the 2019 program will contribute to development of management recommendations from this program.

8.18.1.6 *Blasting Measurement*

The purpose of the blast monitoring program is to measure noise and vibration from explosive blasts at the Whale Tail Pit, and understand how these factors relate to caribou behaviour. The program aims to establish site-specific relationships between noise/vibration levels and blasting parameters (e.g., charge mass, burden depth), environmental conditions (e.g., air temperature, wind direction), and propagation distances. The program includes monitoring of caribou sensory disturbance related to blasting. Blasting is required to be delayed when caribou or other wildlife are observed within the blast danger zone (typically 600 m from the blast centre). Blasting is also delayed when caribou GST is observed within 4 km during the sensitive season, or within 5 km during the calving period, or when muskox GST is observed within 1 km. Relaxing distance restrictions to better understand effects to caribou from blasting was discussed with the TAG in March 2021.

Results from the 2020 blast monitoring are presented in Section 8 of the 2020 Wildlife Monitoring Summary Report (Appendix 47) and summarized below.

Monitoring noise and vibration from explosive blasting at the Whale Tail Pit began in August 2019, following discussions with the TAG in 2018 and 2019.

The 2020 blast monitoring program was limited due to COVID-19. Eleven blast events were monitored at two locations by Agnico Eagle in December 2020. Caribou monitoring was conducted prior to blasts throughout 2020 by Agnico Eagle to determine presence of caribou within a 5 km radius of the blast pattern.

Two blasts in 2020 exceeded the PPV annoyance threshold of 5 mm/s (ANZEC 1990), and one blast exceed the 12.5 mm/s damage threshold (Environment Canada 2009) at the measurement location closest to the Whale Tail Pit. This suggests that ground vibration from blasting may result in annoyance impacts at receptors close to the blast site.

All blasts measured resulted in PPL values below the 128 dBL damage threshold (Environment Canada 2009). However, the 115 dBL annoyance threshold (ANZEC 1990) was exceeded for 5 of the 11 blasts at the measurement location 193 m from the Whale Tail Pit, and 2 of the 11 blasts for the measurement location 569 m from the Whale Tail Pit. This suggests that airblast overpressure from blasting may result in annoyance impacts at receptors in close proximity to the blast site as the monitoring locations (193 m and 569 m from pit edge) are closer to the blast site than the 4 km caribou GST.

Caribou were observed sporadically during blast monitoring in spring and fall 2020. Caribou observed were considered as either Project tolerant (described in Section 9.5 of Appendix 47), or outside the 5 km threshold to trigger blast postponement. Project tolerant caribou observed during blasting displayed no observable behavioural response (e.g., September 9th, 2020). There was one instance where blasting was canceled (4 April 2020) due to observation of 25 caribou approximately 2 km from the Whale Tail Pit.

Please refer to the completed discussion provided in Section 8 of Appendix 47.

8.18.1.7 *Snow Study*

Per Whale Tail Expansion Project commitment 9 from the TAG Meeting held in Baker Lake June 11-13, 2019, Agnico Eagle committed to complete a three-year snow monitoring program as part of the TEMP that measures snow conditions adjacent to the WTHR. The goal of the snow monitoring is to determine whether changes to snow resulting from snow removal along the WTHR result in conditions that potentially inhibit caribou movements.

The first year of snow condition monitoring along the WTHR was completed in 2020. The 2020 monitoring year was considered a “pilot” study year; the methods and preliminary results obtained during the snow monitoring program are outlined below.

Apart from caribou track depth data in unmanaged control plots, a full suite of data was collected at six plots per survey location. Information on caribou track depth in the unmanaged control plots was not collected in May 2020 due to errors in datasheet printing. The datasheets printed in May 2020 did not display the boxes for where the caribou track information was to be recorded so the field staff did not have the reminder to collect this component of the data.

Across all survey plots sampled, snow depth was, on average, deeper on the upwind (west) side of the haul road (38.92 ± 6.97 cm [± 1.0 standard error]) than the downwind (east) side of the road (30.92 ± 7.09 cm). Average snow depth in use plots on the upwind side of the road (38.73 ± 12.07 cm) was similar to the average snow depth in the snow-managed control plots (i.e., plots within the berm but not used by caribou) on the upwind side of the road (39.10 ± 12.08 cm). Snow depths in the downwind plots showed a similar trend; however, use plots (28.87 ± 9.29 cm) had slightly lower average snow depths compared to snow-managed control plots (32.97 ± 14.63 cm). The 95% confidence interval for snow depth measured in use plots overlapped with the confidence interval calculated for snow depth measured in snow-managed control plots suggesting that the difference in mean values between the two plot types was not statistically significant.

The snow hardness, as measured using the push-pull gauge, was far higher at plots on the downwind side (average snow hardness = 15.58 ± 3.23 Newtons [N]) = of the WTHR than plots on the upwind side of the road (average snow hardness = 7.40 ± 1.53 N) = On both the upwind and downwind sides of the WTHR, average snow hardness was lower (i.e., softer snow present) in use plots compared to the two types of control plots.

This program will continue in 2021.

Please refer to the completed discussion provided in Section 17.1 of the 2020 Wildlife Monitoring Summary Report in Appendix 47.

8.18.1.8 *Caribou Behaviour*

Please refer to the completed discussion provided in Section 17.2 and Appendix I of the 2020 Wildlife Monitoring Summary Report in Appendix 47.

In 2020, Agnico initiated a pilot study of data collection that focussed on measuring different behaviour activities of caribou in relation to mine-related effects . The objectives of the pilot study were to:

1) Implement a standardized monitoring method to collect data on caribou behaviours to determine whether it is appropriate in this area, with these caribou, and at this time of year.

2) to collect a set of 100 samples of caribou behaviour through conducting surveys comparing caribou behaviour: a) near vs. far, and b) with and without disturbances.

A total of 116 behaviour surveys were conducted in 2020 when groups of caribou were near infrastructure, including 19 surveys in April, 52 surveys in May, 31 surveys in August, and 14 surveys in November. Surveys were conducted opportunistically whenever caribou were encountered during daily reconnaissance drives, primarily along the AWAR and WTHR but also around the Meadowbank site when the opportunity arose. Key results of the 2020 monitoring include:

- Caribou were within 300 m of the road at the start of the survey on seven occasions, and of these, most were of groups smaller than 50 individuals. Caribou mostly exhibited the non-response behaviours of standing, laying, feeding, and walking.

- An analysis of the first year's data indicated that there is a weak trend for caribou at greater distance from the road (>1,000 m) to have a lower proportion of response behaviours (alert and running). The analysis should be interpreted with caution with only one year of data.

- The proportion of caribou with response behaviours in a group was unrelated to environmental variables including temperature and wind speed.

- During periods when large groups of caribou are present, the AWAR and WTHR are closed following a decision tree in the Meadowbank Mine Terrestrial Ecosystem Management Plan (TEMP), reducing the potential to record interactions between vehicles and caribou.

- Approximately 70% of the surveys included a disturbance event; typically, haul traffic and light trucks from the mine, and occasionally all-terrain vehicles (ATVs) used by community members on the AWAR for travel and harvesting.

- Following a disturbance event, the proportion of response behaviours in a group of caribou rose but generally returned to baseline behaviours within one or two sampling intervals (i.e., 3 or 6 minutes).

- The method of group scans allowed for the estimation of baseline behaviour, response to disturbance, and return to baseline behaviour. Few, if any, surveys ended before caribou returned to baseline behaviour. Thus, 30 minutes appears to be an appropriate amount of survey duration.

Following the 2020 pilot program, Agnico Eagle plans to review the methods and results of this monitoring program with the Meadowbank TAG. Based on this review, the program may be updated for the 2021 field season.

8.18.1.9 *Stop Work 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, to ensure safe passage to large groups of migrating Caribou herds. Section 2.6.4 of the 2020 Wildlife Summary Report (Appendix 47) detailed and discussed the 2020 road closure. Below is a summary of the results.

Significant movements of caribou occurred along the Meadowbank AWAR from approximately mid-April to late April, from mid-August to late September, and from mid-October through mid-November in 2020, resulting in multiple closures to Project-related traffic. The AWAR was fully closed on 38 days, and partially closed on 21 days, for a total of 59 days with restriction in 2020. Restrictions were generally due to presence of caribou, however mitigation measures such as reduced speeds were instituted due to the presence both muskox and caribou herds in mid-August.

Significant movements of caribou during the spring from approximately mid-March to early-May 2020, and in the summer in early August resulted in multiple closures of the WTHR. The WTHR was fully closed on 11 days, and partially closed on 5 days, for a total of 16 days with restriction in 2020.

Road-related monitoring and mitigation is implemented according to Figures 7 and 8 of the TEMP V7 2019. Collar location maps were instrumental in assessing the need for increased road monitoring. Road-related mitigation related to caribou presence in 2020 resulted in road closures and a corresponding reduction in total vehicle movements in the spring. Road closures were implemented or vehicle movements were restricted (e.g., light vehicles only, speed limited enforced) in response to high caribou numbers. Convoys were organized by Environment staff, which had the training to decide whether vehicles could continue along the road when caribou were sighted.

Regular wildlife warnings were dispatched based on observation and monitoring data. The road supervisors and operators also ensured protection of wildlife by assisting in surveillance and closing roads as needed. Radio notices reminding operators of the appropriate speed limit were made frequently by dispatchers. During caribou peak migration, notices were sent to all road occupants, regulatory agencies, local groups and wildlife consultants were notified, and road survey efforts were increased.

The frequency of road surveys in 2020 demonstrate Agnico Eagle's commitment to preventing impacts to caribou from the AWAR, WTHR (including Vault Haul Road). Mitigation measures such as reduced speeds, convoys, and multiple road closures function to minimize road-related effects including mortality and caribou passage. Incidental sightings in 2020 recorded in the Wildlife Log (Appendix A of the Wildlife

Summary Report) and road surveys showed that caribou crossed roads throughout the year, with especially high numbers during spring and fall migration.

8.18.1.10 *Raptor Nest Survey*

Refer to Section 13 of the 2020 Wildlife Monitoring Summary Report (Appendix 47) for a complete discussion of the methodology and results.

The raptor nest monitoring program is designed to determine Project-related effects, and the success of mitigation strategies to prevent disturbance to nesting raptors. Within the Meadowbank LSA and AWAR LSA, peregrine falcons have previously nested in quarries along the AWAR, the Portage Pit, and Goose Pit. Monitoring of peregrine falcon nests in quarries along the AWAR has been conducted since 2009. The Portage, Goose, Vault, Whale Tail, and IVR Pits are inspected for peregrine falcon activity daily prior to and during the nesting season, and managed under the Peregrine Falcon Management and Protection Plan.

Surveys from 2015, 2016, 2017, and 2019 identified 58 raptor nesting sites in the Whale Tail RSA. Peregrine falcon and rough-legged hawk nesting sites were located within 1.5 km of Project facilities in the Whale Tail LSA. Annual monitoring of these nests was recommended, however these nests are not expected to be directly impacted by the Project due to their distance from Mine activity.

The number of nests currently monitored annually does not allow for statistical analysis to determine the relationship between nest success and Mine activity. Development of a study design that supported analysis of nest success in relation to Mine activity for the Meadowbank, AWAR, and Whale Tail sites was proposed for 2020, but was not completed due to COVID-19 and was postponed to 2021. Monitoring in 2020 included surveys for nests associated with pits and quarries along the AWAR and WTHR. Raptor activity and potential nest locations were also noted on other surveys including road surveys, viewshed surveys, freshet monitoring, and on-site environmental monitoring.

Thirteen peregrine falcon nesting sites have been recorded in the Meadowbank LSA and AWAR LSA since nest monitoring began in 2009. Six active peregrine falcon nests were documented in Quarries 2, 7, 9, 16, 19, and 21 along the AWAR in 2020. Nests have been identified at all six of these quarries in previous years. No nesting evidence was observed at previous nest sites at Quarries 3, 8, 17, 18, and 22. In addition to the six active nest sites in 2020, peregrine falcon activity was observed at Quarries 1, 3, 8, 14, 15, 17, 18, 22, and 30 during the monitoring program. Quarries 10, 26, 30, 35, 50, and 52 were monitored along the WTHR in 2020. No raptor nesting evidence was observed in quarries along the WTHR in 2020, however one falcon was observed at Quarry 30 on 21 August. No other nests were identified during pit checks or incidentally during other surveys in 2020. Cumulative information on Peregrine Falcon nests from 2009 to 2020 is summarized in in Table 39 and Figure 13 of the 2020 Wildlife Monitoring Summary Report (Appendix 47).

Nest sites are monitored using non-disruptive techniques, which include monitoring from vehicles within the quarry or from the road, to ensure that active nests are not approached by Agnico Eagle personnel. Presence of aggressive adults, eggs, and chicks are used to identify active nests. To minimize direct disturbance to nesting birds and as per recommendations, intensive monitoring, which would require approaching nests by foot, is not conducted.

Once an active nest has been identified, mine-related activity (e.g., vehicle operation, heavy equipment, aircrafts, blasting etc.) is automatically halted within the quarries with the only disturbance being traffic on the nearby AWAR. Specific raptor nest management plans were not warranted at any of the active nest sites, as mine-related activity was restricted within the quarries.

The 2020 raptor monitoring data were compared to the impact prediction thresholds to evaluate adherence to impact predictions and provision of adaptive management, as either a necessary or proactive measure. No thresholds were surpassed in 2020.

8.18.1.11 *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 of raptor at both the Meadowbank and Whale Tail sites in 2020.

Once an active nest has been identified, mine-related activity (e.g., vehicle operation, heavy equipment, aircrafts, blasting etc.) is automatically halted within the quarries with the only disturbance being traffic on the nearby AWAR/WTHR.

A bird cannon was deployed on May 23 to "discourage" the peregrine falcon to establish their nest in that quarry before scarification occurred. The bird cannon was set in the interval Random 10, meaning a shot series is randomly chosen by the control-unit between 1 and 10 minutes. The bird cannon was removed once peregrine falcon activity was observed in the quarry. All activity within the area, including scarification, were postponed minimizing the impact of potential nesting for this species and therefore ensure proper conditions of nesting activity. In addition, to minimize direct disturbance to nesting birds and as per recommendations, intensive monitoring, which would require approaching nests by foot, is not conducted. Agnico Eagle is also careful not to broadcast locations of nesting birds to avoid inadvertent disturbance by curious mine employees.

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, Inuit Qaujimajatuqangit shared by knowledge holders 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 work with the Government of Nunavut, the Baker Lake Hunters and Trappers Organization and the Kivalliq Inuit Association through the Terrestrial Advisory Group to develop and update thresholds to trigger implementation of mitigation measures on both the AWAR and Whale Tail Haul road, up to and including temporary road closures. The Proponent shall consider how these thresholds and mitigation measures reflect caribou life cycle sensitivities as well as demonstrate how Inuit Qaujimajatuqangit was incorporated throughout the development of these criteria and procedures.***

The Proponent shall ensure the Terrestrial Ecosystem Management Plan is updated to reflect the thresholds agreed upon in accordance with the Terrestrial Advisory Group Terms of Reference, 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 of the 2018 Annual Report. The TOR was officially signed by all parties in 2019.

In fulfillment of the Condition 27, a summary of outcomes from Terrestrial Advisory Group meetings are provided in the below section. Fulfillment of Condition 30 is discussed in Section 8.18.2.1.2.3.

8.18.2.1 *Terrestrial Advisory Group*

8.18.2.1.1 Meetings held in 2020

In accordance with Nunavut Impact Review Board Project Certificate No.008 Term and Condition 27, a Terrestrial Advisory Group was established for the Meadowbank and Whale Tail project. It provides technical oversight on the Project's mitigation, monitoring and adaptive management measures related to the protection of wildlife. The following parties are actively part of the Terrestrial Advisory Group: the Baker Lake Hunter and Trapper Organization, the Government of Nunavut, the Kivalliq Inuit Association, and Climate Change Canada. It is also a venue for TAG members to openly raise concerns about wildlife, and to review and discuss the results of wildlife monitoring and to discuss opportunities for ongoing research.

Terms of reference were finalized and signed by all parties in 2019. Several TAG meetings were held since June 2018. Meetings held in 2020 are summarized in Table 8-127 below. Because of the COVID-19 pandemic situation, all 2020 meetings were done as a conference call.

Table 8-127 TAG meeting held in 2020

Date	Type of meeting	Parties attending
April 20th, 2020	Conference call	HTO, KivIA, GN
July 7th, 2020	Conference call	HTO, KivIA, GN
October 20th, 2020	Conference call	HTO, KivIA, GN
December 10th, 2020	Conference call	HTO, KivIA, GN

Discussions held in 2020were fruitful and led to numerous resolutions on files/brainstorming sessions. To facilitate discussions during meetings or conference calls, where possible, Agnico Eagle provided agenda and reports summarizing thoughts prior to the TAG meeting. When feedback was provided prior to the meeting, these were incorporated into the presentation made at the meeting. This ensured discussions targeted key items and facilitated resolution of issues and closing of commitments made.

8.18.2.1.2 Summary of outcomes

The next section describes the main outcomes arising from TAG meetings held in 2020 by topic.

8.18.2.1.2.1 GST and Caribou Protection Measures

Many discussion were held in 2020 regarding the calculating method for caribou's Group Size Thresholds along with other TEMP mitigations for the WTHR and AWAR. At the end of 2020, discussion with the TAG were still ongoing and no decision was taken.

8.18.2.1.2.2 HPGR

In December 2020 meeting, Agnico mentioned his intent to grow the long-haul fleet from 26 to 30 trucks. The increase in hauling capacity will surpasses the planned increase in mill throughput therefore leading to a greater ability to generate ore stockpile at Meadowbank. The resulting increase in traffic on the WTHR (above the FEIS) will occur outside of the critical migration season of caribou. Maintaining healthy stockpile at Meadowbank is considered by Agnico as a primary mitigation for the caribou migration season as it reduce the risk of impact on milling operation if more days of road closure are to occur.

8.18.2.1.2.3 Snow Study

As part of the Whale Tail Expansion Project NIRB Review process, Agnico Eagle committed to develop and implement a three-year snow monitoring program that measures snow conditions related to removal of Haul Road snow. A proposed program was presented in November 2019 and following comments received from TAG members, the program has been greatly modified to incorporate input. The first year of snow condition monitoring along the WTHR was completed in 2020. The 2020 monitoring year was considered a "pilot" study year; the methods and preliminary results obtained during the snow monitoring program are outlined below. More detail are provided in Appendix 47 of the 2020 Annual Report

8.18.2.1.2.4 Drone and Satellite Pilot Projects

Agnico Eagle has been looking at different technologies, including drones and use of satellite imagery to improve monitoring, ensure efficient mitigation and assess effects of the Project on caribou. Following a drone public demonstration held in Baker Lake in August 2019, Agnico Eagle proposed a drone and satellite pilot project to TAG members during a conference call. Feedbacks received were incorporated into the design of the program. The pilot test was initially planned for the Fall 2019 migration but could not be implemented due to timeline in receiving permits. It was then planned for Spring 2020 but postponed till COVID-19 pandemic restriction are lifted.

8.18.2.1.2.5 Incorporation of Outcomes into the TEMP

The TEMP was revised to Version 8 to incorporate these outcomes. As per revised Terms and Conditions of NIRB Project Certificate No.008, Version 8 was submitted to NIRB within 60 days following issuance of the revised Project Certificate. Comments were received mainly regarding the proposed GST in this updated version and discussion with TAG were still ongoing at the end of 2020. An updated Version 8.1 is planned to be submitted in 2021.

8.18.2.1.2.6 Caribou Behaviour

Agnico collects different types of behaviour data on caribou that are used to inform on mine-related effects to caribou and mitigation effectiveness. In 2020, Agnico initiated a pilot study of data collection that focussed on measuring different behaviour activities of caribou in relation to mine-related effects. Following the 2020 pilot program, Agnico Eagle will review the methods and results of this monitoring program with the Meadowbank TAG, in early 2021. Based on this review, the program may be updated for the 2021 field season.

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.***

Following consultation of the Baker Lake HTO, Agnico re-slopped the Whale Tail Haul Road (WTHR) at KM 127 to facilitate the wildlife passage in this area. BLHTO came back once the re-slopping was finalized and didn't not express any other concern.

Within the TAG meetings, permeability and road design discussions are ongoing and will meet satisfaction of all parties. Different projects are also ongoing and are being discussed at the TAG, including monitoring movement of caribou with cameras and a pilot drone study. All of the above project will be highly useful into the determination of the preferred wildlife passage and behavior on the field.

As part of the Whale Tail expansion project, Agnico has committed to conduct an analysis of available scientific and IQ caribou data (including collar, road sightings, trails, oral testimony and mapping) to determine sections of the Haul Road that are most likely to be used by migrating caribou. In July 2019, Agnico submitted to NIRB and TAG member a memo to fulfill this commitment. Following this submission, only the KivIA provided comments. Agnico Eagle submitted a revised version in August 2019 and only received comments from KivIA since submission. Agnico Eagle presented the updated report to the TAG on November 26th, 2019 for final approval. The following step will be to organize a site visit with TAG member to refine further required changes along the Whale Tail Haul Road (and based on sections identified in the report provided). The site visit was tentatively planned for Q2 2020 but was postponed till the COVID-19 pandemic restriction are lifted. Following this, a Construction Plan, will be provided to TAG members and the NIRB, if the WTHR enlargement is required.

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 2.6.7 of the 2020 Wildlife Summary Report (Appendix 47) describe road-related wildlife mortality along the Whale Tail Haul road in 2020 In 2020, there was no project-related mortality along the WTHR. Two caribou mortalities occurred along the WTHR but were not project-related as they were suspected to be wolf kill. The GN Conservation Officer in Baker Lake was advised. Similar information regarding Meadowbank site can also be found in this section of the appended report.

Section 3.5.6 of the 2020 Wildlife Summary Report (Appendix 47) provide a summary of recorded wildlife fatalities near or within the mine site in 2020. A total of 5 wildlife mortalities from 2 species (Arctic fox and wolverine) were observed around the Whale Tail in 2020 and were attributed to Mine-related activities (suspected vehicle collision). As per the IIBA Schedule J, Item 6, a compensation was sent to KivIA and the complete report regarding this incident sent to the GN Conservation officer and KivIA. Similar information regarding Meadowbank site can also be found in Section 3.5.6 of the 2020 Wildlife Summary Report.

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.

In July, 2018, Agnico developed the Migratory Bird Protection plan as an appendix of the TEMP. As recommended by ECCC, Agnico updated that plan for 2020 based on results of research studies to date.

The updated Migratory Bird Protection Plan (V3, March, 2020) was provided as Appendix 64 of the 2019 Annual Report.

The 2020 Migratory Bird Protection report is provided as Appendix E of the 2020 Wildlife Summary Report (Appendix 47), and summarized below.

Through collaboration with Trent University and ECCC, research studies were initiated in 2018 to determine the effectiveness of flood mitigation measures for migratory birds in the Whale Tail South area. The three objectives of this research study were to:

1. Determine the efficacy of various audio and visual deterrents (for preventing flood-zone nesting).

2. Estimate the number of nests and the species composition lost due to the flooding.

3. Examine the behavioural response of birds to the flooding (determine whether birds re-nested or moved after the flooding events) and behavioural response to deterrents (e.g. impacts to duration on the nest).

Although the third and final field season in 2020 was unable to proceed due to COVID-related restrictions, sufficient data was collected in 2018 and 2019 to fulfill Objectives 1 and 2, and to examine various behavioural responses of birds to deterrents. The examination of behavioural response to flooding (whether birds re-nest nearby) will be examined if feasible by the Trent/ECCC research team during field studies in 2021.

Based on the results of this research study in 2018 and 2019, the tested mitigation methods were found to be ineffective in deterring nesting birds, and their continued use was not recommended by the Trent/ECCC research team. Therefore, in accordance with the updated Migratory Bird Protection Plan (March, 2020), these measures were not implemented in 2020 .

Both the FEIS for the Whale Tail Pit Project (Agnico Eagle, 2016) and the FEIS Addendum for the Whale Tail Expansion Project (Agnico Eagle, 2018) made predictions for the number of nest sites estimated to be displaced by flooding in the vicinity of the Project site. Nest displacement was re-estimated here using nesting densities observed by the research team in 2018 and 2019, along with measured peak water levels during the 2018 – 2020 nesting seasons. Based on these calculations, estimated impacts of flooding on nesting birds have been lower to date than FEIS Addendum estimates, despite changes in flood rates compared to FEIS predictions.

These estimates do not differentiate between nests that are lost directly from inundation and potential losses due to territory flooding, and therefore are useful for providing a conservative estimate of impacts. However, final estimates of the number of nests lost due to flooding through direct inundation are still being calculated by the Trent/ECCC research team. These results, along with the analysis of behavioural response to flooding (whether birds re-nested or moved after the flooding events, to be evaluated in 2021 via field studies by the research team, if feasible), will provide a further indication of the actual impacts of flooding on the local breeding bird population.

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.***

The intent of the federal Species at Risk Act, is to protect species at risk from becoming extirpated or extinct as a result of human activity. Species with ranges that overlap with the Expansion Project, may be considered to be of concern as a result of either their national, territorial or Committee on Status of Endangered Wildlife in Canada (COSEWIC) status. To date, no species have been listed under the Nunavut Species at Risk Act.

There are six wildlife species of concern with breeding or wintering ranges that overlap with the Expansion Project (Table 8-128). In November of 2016, caribou were designated as threatened by COSEWIC (2016). Although there are changes to wildlife species of concern, these are the same species assessed in the Approved Project.

Table 8-128 Species of Concern Meadowbank and Whale Tail Study Areas

Species	COSEWIC Assessment	Federal Species at Risk Act	Potential Impact
Caribou (Barren-ground population)	Threatened	No status	• Direct habitat loss • Indirect habitat loss from sensory disturbance
Grizzly bear (western population)	Special Concern	No status	• May be attracted to developments if food is available • -Direct habitat loss
Wolverine (western population)	Special Concern	No status	• May be attracted to developments if food or shelter is available • -Direct habitat loss
Peregrine Falcon (*anatum-tundrius* complex)	Not at risk	Schedule 1	• Direct habitat loss
Short-eared Owl	Special Concern	Schedule 1	• Direct habitat loss
Red-Necked Phalarope	Special Concern	No status	• Direct habitat loss

Agnico will 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. Updates to the Species at Risk 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.***

In 2019, Agnico Eagle initiated a non-native plant monitoring study to assess and monitor the potential introduction of non-native plant species, including weeds or invasive species. A second monitoring event occurred in July 2020. Subsequent surveys will be completed annually as per the TEMP Version 7. Complete 2002 results are presented in Appendix H of the 2020 Wildlife Monitoring Summary Report – Appendix 47. Agnico will refer to the complete report in Appendix as the below is a summary of the results.

Surveys at the Meadowbank Complex were conducted by a Golder vegetation ecologist between July 24 to August 2, 2020. The Meadowbank Complex area includes the AWAR, WTHR, Baker Lake tank farm, Whale Tail site, and Meadowbank Mine site areas.

Due to the large extent of the Meadowbank Complex area, non-native plant surveys were executed as targeted surveys focused within high-priority or potential areas. High-potential areas were identified including highly trafficked areas (i.e., fuel station), wastewater discharge area, areas surrounding buildings, shipping containers and the dump, for example. The AWAR and Whale Tail haul roads were surveyed at slow speed, while observing for weed infestations along road margins. Periodic stops were undertaken to complete meanders in areas with high potential (e.g., pull-outs, work areas, quarries and areas of disturbed substrate). A GPS was used to collect a trackfile of the meander route.

A total of 175 locations were surveyed. Locations assessed included the Whale Tail and Meadowbank Mine footprint areas, the sides of the haul roads, quarries adjacent to the haul roads, the airstrip, and the Baker Lake tank farm.

No non-native plants, as identified by the CESCC, were recorded along the haul road, AWAR, Baker Lake tank farm, Whale Tail and Meadowbank Mine footprints.

Although not listed as a non-native species by the CESCC, populations of flixweed (*Descurainia sophia*) and scentless chamomile (*Tripleurospermum inodorum*), both non-endemic to the Arctic, were observed at several of the surveyed locations. There was also a population of alsike clover (*Trifolium hybridum*) and lamb's quarters (*Chenopodium album*) observed at one location. Refer to Section3 for more information regarding the non-native plant survey findings from the 2020 surveys in Appendix H of the 2020 Wildlife Monitoring Summary Report (Appendix 47).

Furthermore to the study detailed above, Agnico continue to implement in 2020, in accordance with the TEMP, a protocol to ensure that all equipment and bulk supplies must arrive to Project site free of soil or plant debris to minimize the risk of invasive plant introduction. Invasive plant inspection surveys was completed on cargo in Becancour, prior to being loaded onto shipping vessel. Carrier had closely follow the procedure and have confirmed that each equipment/sea can was free of invasive plant.

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 004, Condition 67, a Wildlife Screening Level Risk Assessment (WSLRA) and Human Health Risk Assessment for the Consumption of Country Foods (HHRA) (field programs) were last completed in 2017 to evaluate risks to wildlife and human health from contaminant exposure during operation of the Meadowbank mine. The WSLRA/HHRA is planned to be completed every 3 years during mine operation, however the field program could not be completed in 2020 due to restriction associated with the COVID-19 pandemic. Please refer to the 2017 Annual Report for a complete review of the results.

No unacceptable mine-related risk to wildlife or human health was reported in the last assessment, nor is any anticipated as a result of the Whale Tail Pit Expansion Project (Golder, 2019).

The WSLRA Plan was updated in April, 2021 (Appendix 48) to reflect comments from and discussions with regulators (ECCC) during the Whale Tail Pit Expansion Project permitting phase, and the associated field program will be carried out in 2021.

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.***

And

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:***

- ***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***
- ***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.

There was no archaeological impact assessment conducted in 2020. The last one was in 2019 at seven locations along the road between Baker Lake and Meadowbank Mine; six of these are quarry expansions, and one is a pad and no archaeological sites were identified during the assessment conducted.

Agnico Eagle has submitted to the GN Cultural and Heritage department the 2019 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 8-129 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 2020, temperatures and winds recorded were similar to annual trends observed from 2009-2019. The coldest temperature was -43.11°C and warmest 28.76°C. The maximum wind speed recorded in 2020 was 19.93 m/s. Total precipitation in 2020 (168.99 mm) was lower than previous year but similar to 2018: 2019 (334.54 mm) 2018 (154.38 mm), 2017 (268.35 mm) and 2016 (299.45 mm). Figure 30, 31 and 32 below show, respectively, the temperature average, wind speed average and total precipitation data from 2009-2020.

Table 8-129 Meadowbank 2020 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	-27.44	-9.58	-38.58	4.76	19.78	7.15	0.26	2.40
February	-32.08	-14.46	-43.11	5.53	18.38	13.90	0.5	4.60
March	-27.06	-7.99	-40.78	5.62	18.15	7.73	0.29	2.40
April	-19.14	-2.45	-36.57	4.41	19.93	4.70	0.21	2.40
May	-9.19	-0.79	-22.08	NA	NA	14.10	0.46	5.80
June	5.17	24.43	-7.76	NA	NA	9.10	0.33	8.90
July	14.80	25.88	6.12	3.07	17.37	33.11	1.27	21.0
August	12.21	28.76	1.28	NA	NA	23.75	0.77	15.80
September	3.37	10.84	-3.58	NA	NA	18.20	0.61	8.30
October	-4.65	2.44	-17.35	NA	NA	22.85	0.85	7.45
November	-20.08	-7.70	-29.53	NA	NA	5.35	0.18	1.60
December	-26.24	-5.81	-42.13	NA	NA	9.05	0.29	5.20
Total	NA	NA	NA	NA	NA	168.99	NA	NA
Average	-10.86	3.63	-22.84	4.68	18.72	14.08	0.50	7.15

Figure 30 Meadowbank Site Temperature Average 2009-2020

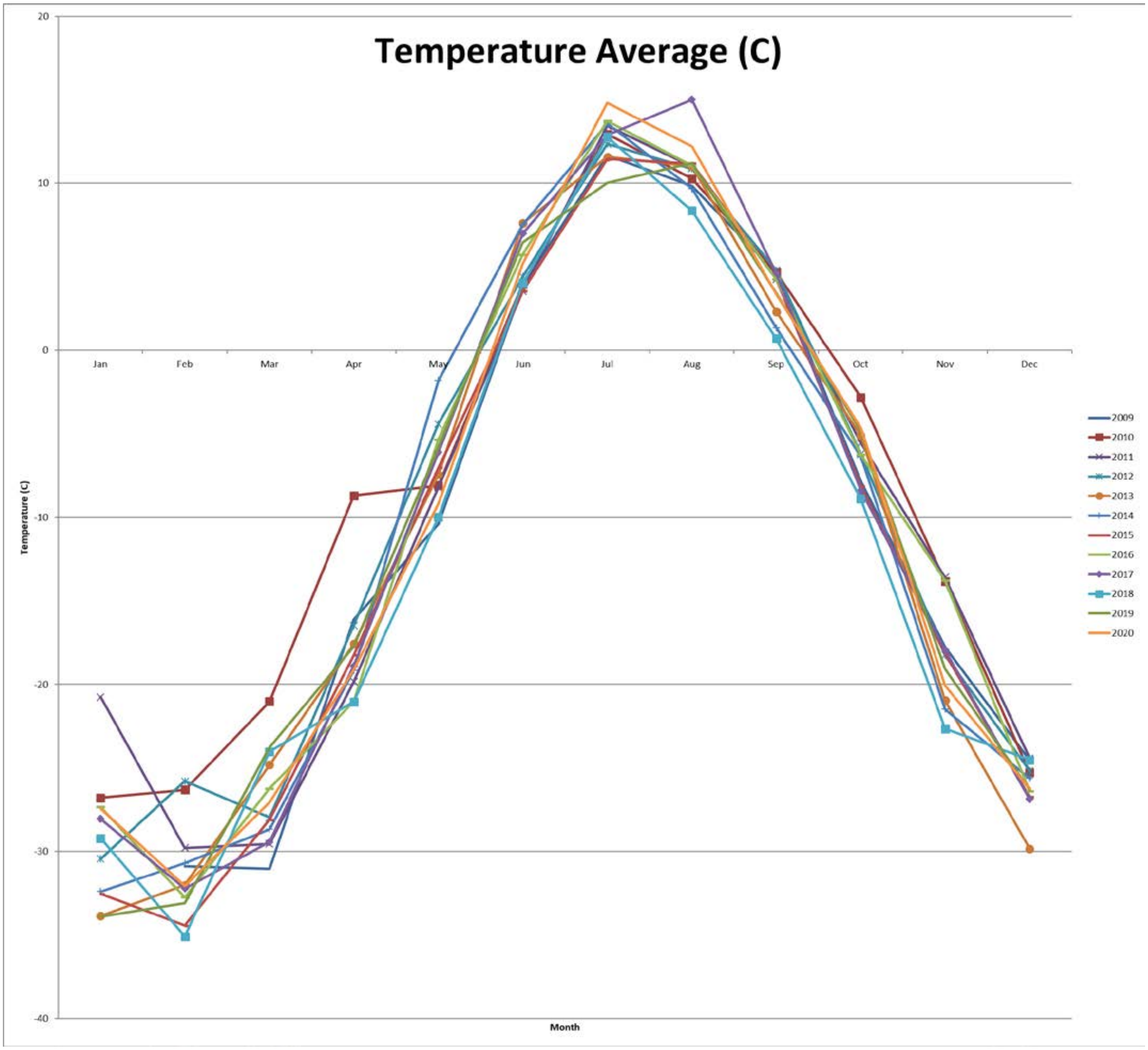


Figure 31 Meadowbank Site Wind Speed Average 2009-2020

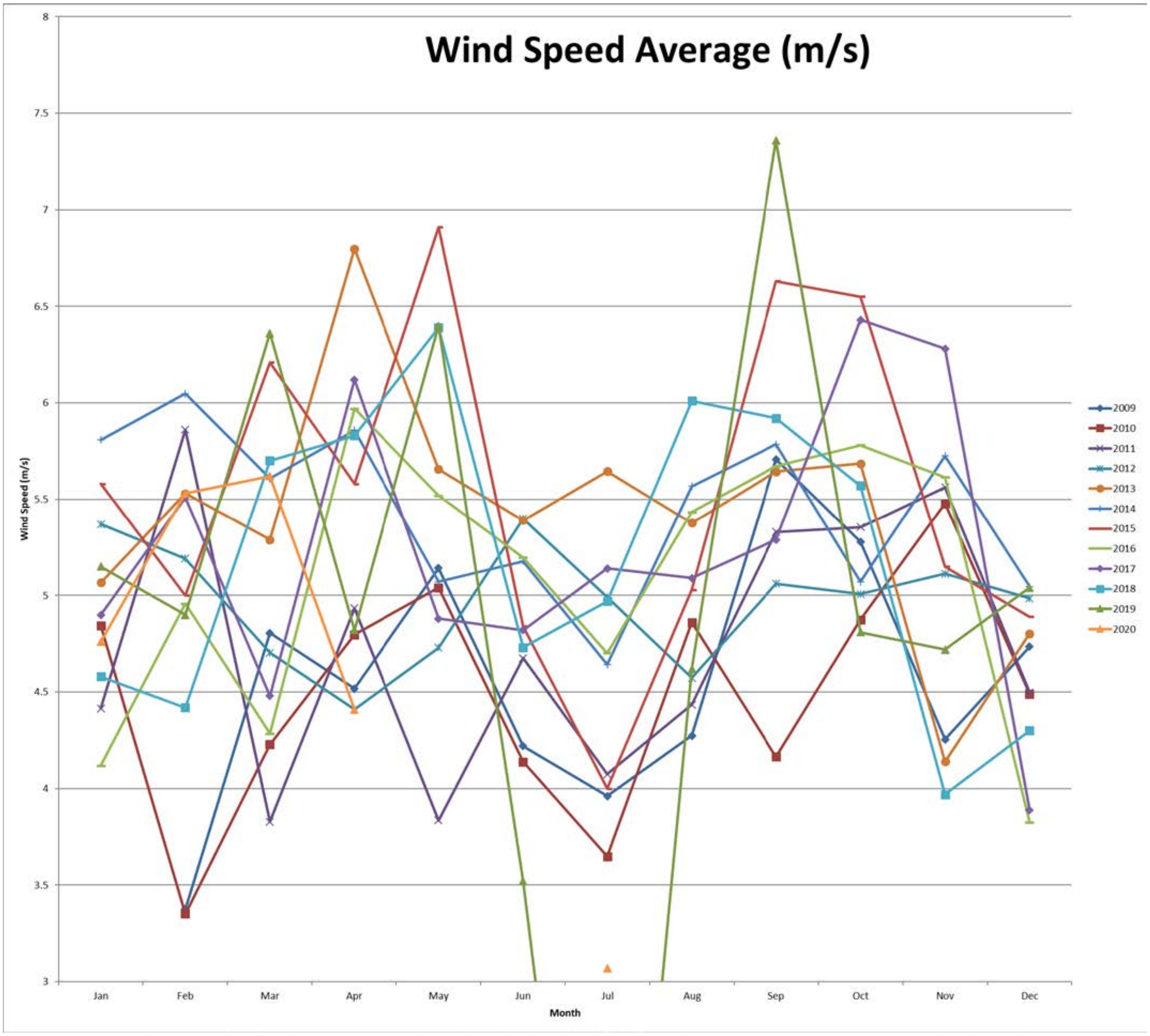
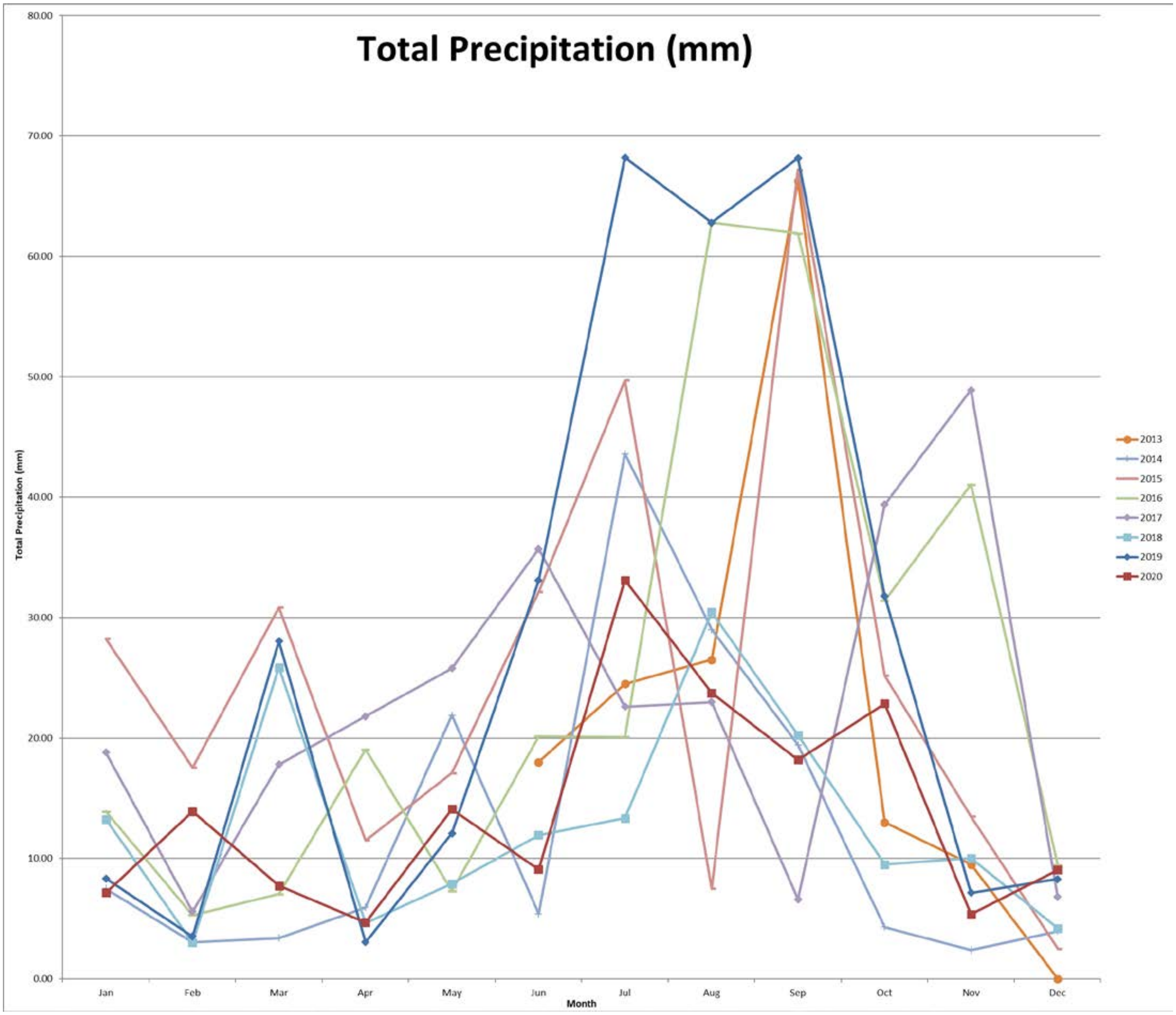


Figure 32 Meadowbank Site Total Precipitation 2013-2020



8.21.2 Whale Tail Site

The meteorological station at Whale Tail was in function for all of 2020. Table 8-130 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 2020, temperatures, winds and precipitation recorded were similar to the data obtained for Meadowbank Site and to historic data from Meadowbank and Baker Lake from 2009-2020. Figure 33, 34 and 35 below show, respectively, the temperature average, wind speed average from 2018-2020 and total precipitation data for 2019-2020. The coldest temperature for Whale Tail in 2019 was -44.60 °C and warmest 30.88°C and is similar to data obtained for Meadowbank. The maximum wind speed recorded was in January 2020 with 23.36 m/s compared to 19.78 m/s for Meadowbank. Total precipitation at Whale Tail site (198.05 mm) were higher than Meadowbank in 2020 (168.994 mm).

Table 8-130 Whale Tail 2020 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	-28.25	-12.68	-40.67	5.60	23.36	18.1	0.58	10.0
February	-32.76	-16.12	-44.60	6.32	19.56	10.5	0.36	2.2
March	-26.89	-6.41	-40.87	6.35	20.44	8.5	0.27	2.2
April	-19.4	-1.71	-35.65	6.47	19.36	13.7	0.46	4.5
May	-8.93	0.33	-21.29	6.29	17.91	11.1	0.36	4.3
June	5.96	25.96	-6.68	5.27	20.15	23.4	0.78	15.2
July	15.66	27.23	7.27	5.59	19.01	26.6	0.86	14.8
August	12.18	30.88	0.34	5.64	18.37	24.0	0.77	16.0
September	2.77	11.32	-4.67	6.45	17.88	20.0	0.67	9.4
October	-5.14	2.32	-18.38	6.70	21.05	27.5	0.89	13.2
November	-20.68	-8.87	-30.64	4.47	20.05	5.0	0.17	1.6
December	-26.99	-5.66	-43.45	5.03	16.19	9.65	0.31	2.8
Total	NA	NA	NA	NA	NA	198.05	NA	NA
Average	-11.04	3.88	-23.27	5.85	19.44	16.50	0.54	8.02

Figure 33 Whale Tail Site Temperature Average 2018-2020

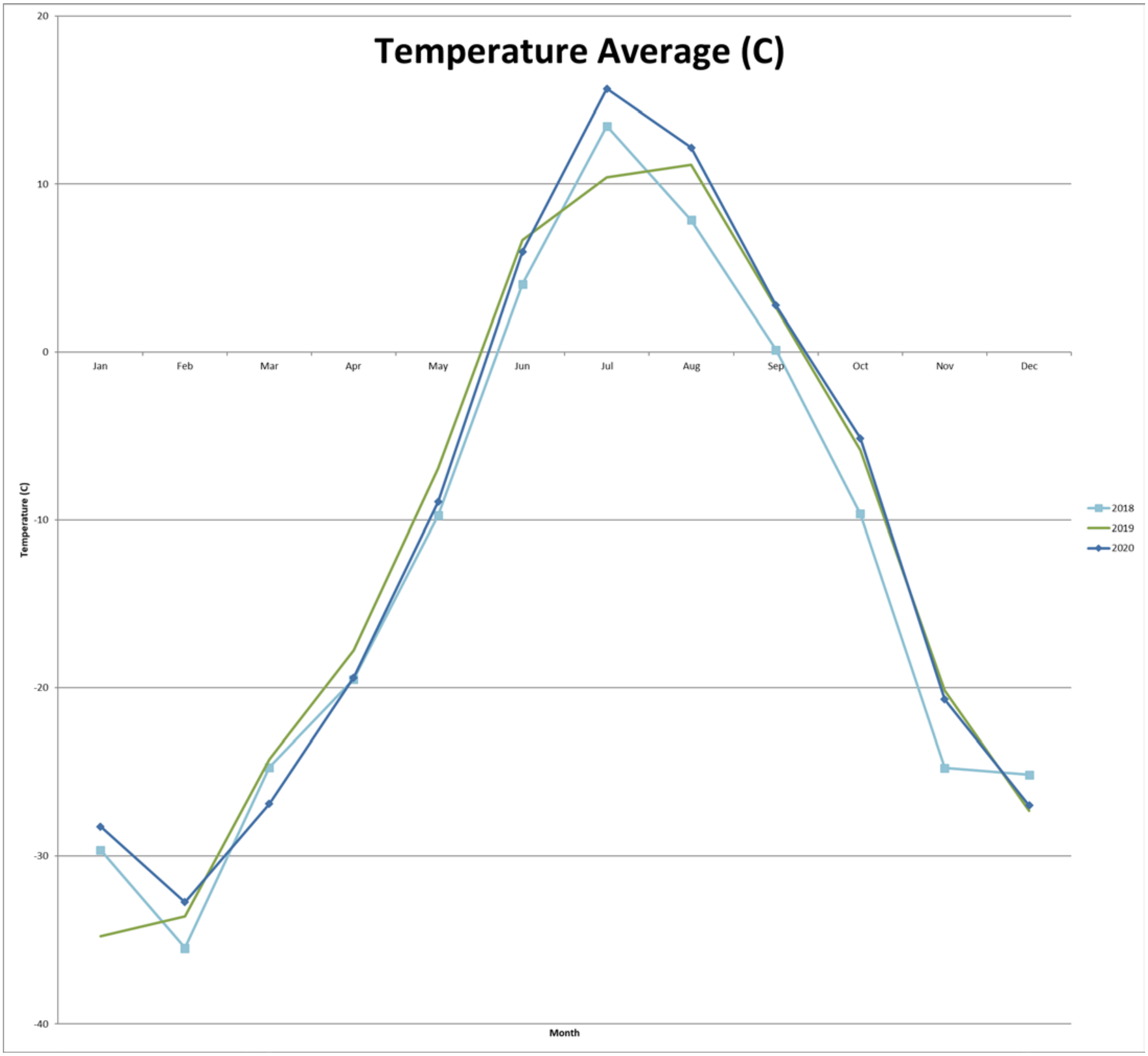


Figure 34 Whale Tail Site Wind Speed Average 2018-2020

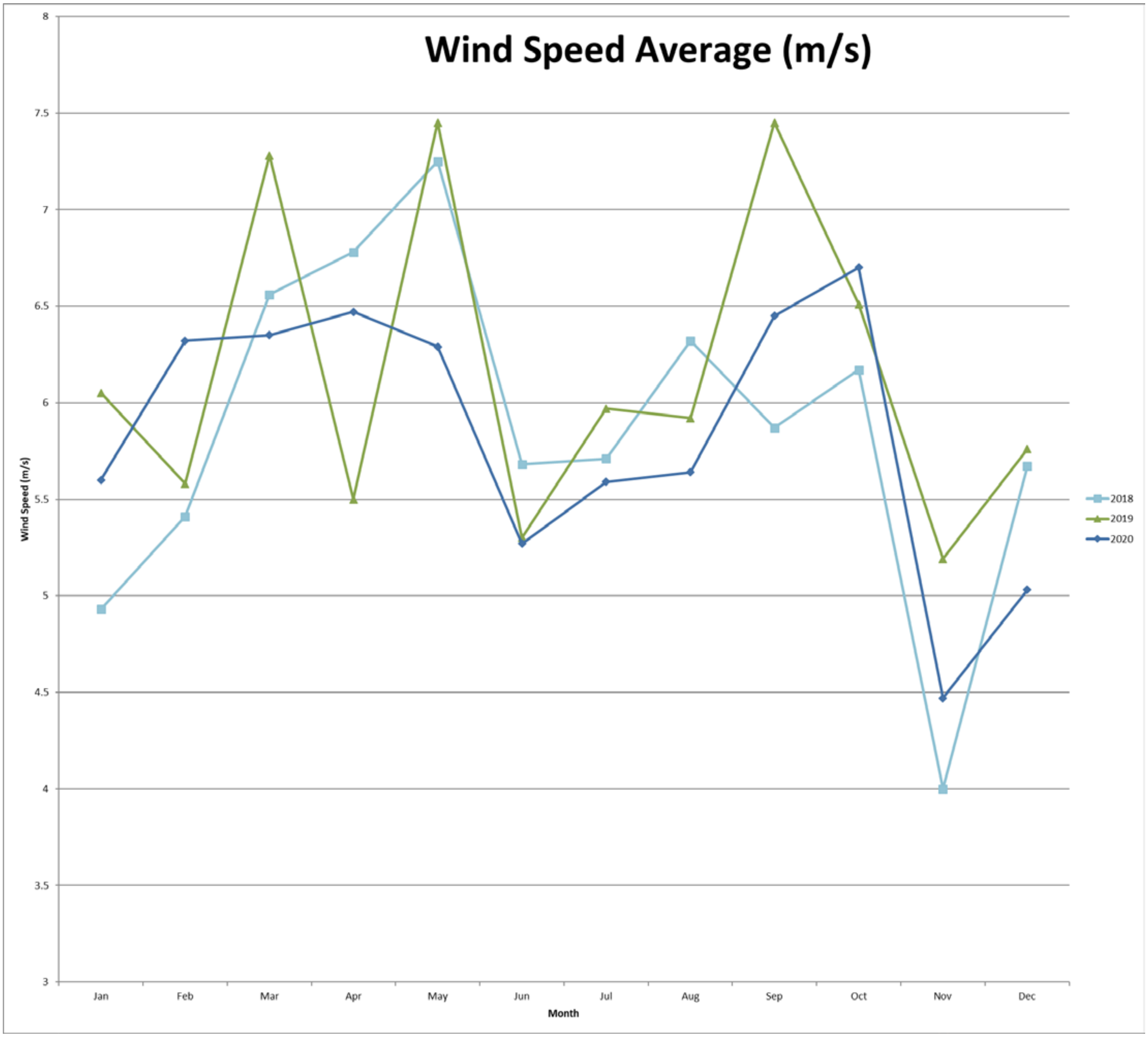
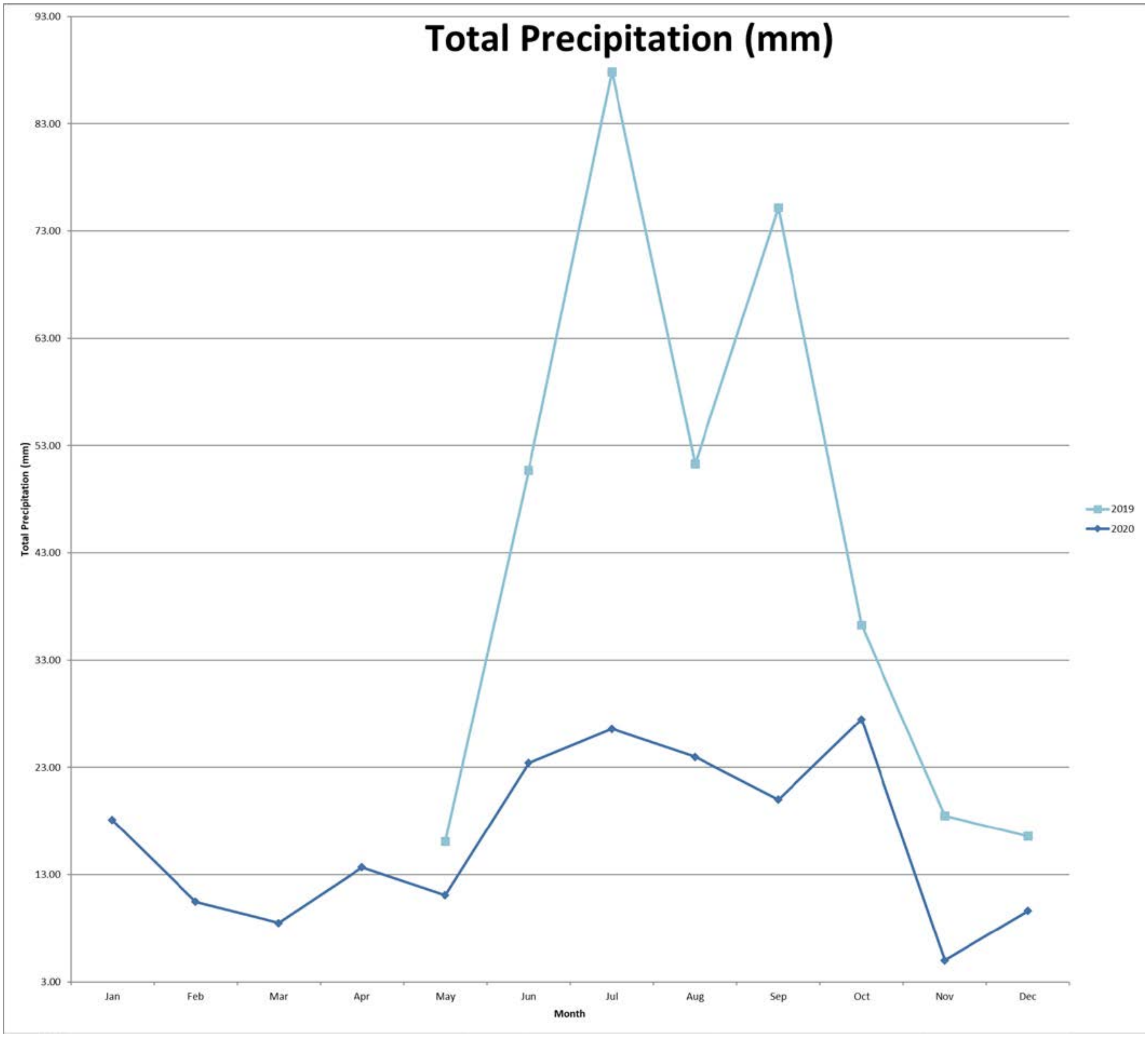


Figure 35 Whale Tail Site Precipitation 2020



Historic average is provided in Table 8-131 and Figures 36 to 38 below for temperature average, total precipitation and wind speed max. Temperature average were very similar for Meadowbank, Whale Tail and Baker Lake. Precipitation at Meadowbank and Baker show a similar trending. It's difficult to compare the historic data to Whale Tail for precipitation as the data started to be collected only in May 2019. For the wind speed max, Meadowbank and Whale Tail have similar trending as Baker Lake.

Table 8-131 Historic Meadowbank, Whale Tail and Baker Lake monthly climate data

Date	Meadowbank (average 2009-2020)			Whale Tail (average 2018-2020)			Baker Lake (average 2009-2020)		
	Temperature Average	Wind Speed Max	Total Precipitation	Temperature Average	Wind Speed Max	Total Precipitation	Temperature Average	Wind Speed Max	Total Precipitation
	°C	m/s	mm	°C	m/s	mm	°C	m/s	mm
January	-29.34	19.30	13.88	-30.89	21.14	18.10	-29.30	22.47	10.17
February	-31.30	18.76	7.42	-33.95	18.80	10.50	-30.12	21.89	9.99
March	-26.42	19.71	17.24	-25.29	22.79	8.50	-25.57	22.22	10.75
April	-17.98	19.75	10.10	-18.89	19.05	13.70	-17.04	22.37	14.37
May	-6.67	18.94	15.17	-8.54	19.58	13.60	-5.88	19.87	17.41
June	5.35	18.13	20.69	5.55	19.81	37.05	5.65	19.09	19.81
July	12.68	17.72	34.40	13.17	19.04	57.25	12.29	18.08	29.31
August	11.08	18.27	33.23	10.39	20.22	37.65	11.07	19.77	37.44
September	3.46	21.16	41.00	1.85	20.64	47.60	3.90	21.36	48.93
October	-6.11	20.10	22.18	-6.88	22.81	31.89	-5.51	21.69	24.11
November	-18.17	20.43	17.23	-21.87	18.79	11.75	-17.93	21.62	26.20
December	-26.13	18.56	6.32	-26.48	20.08	13.13	-25.27	21.69	16.11

Figure 36 Historic Comparison Meadowbank, Whale Tail, Baker Lake Site Temperature Average 2009-2020

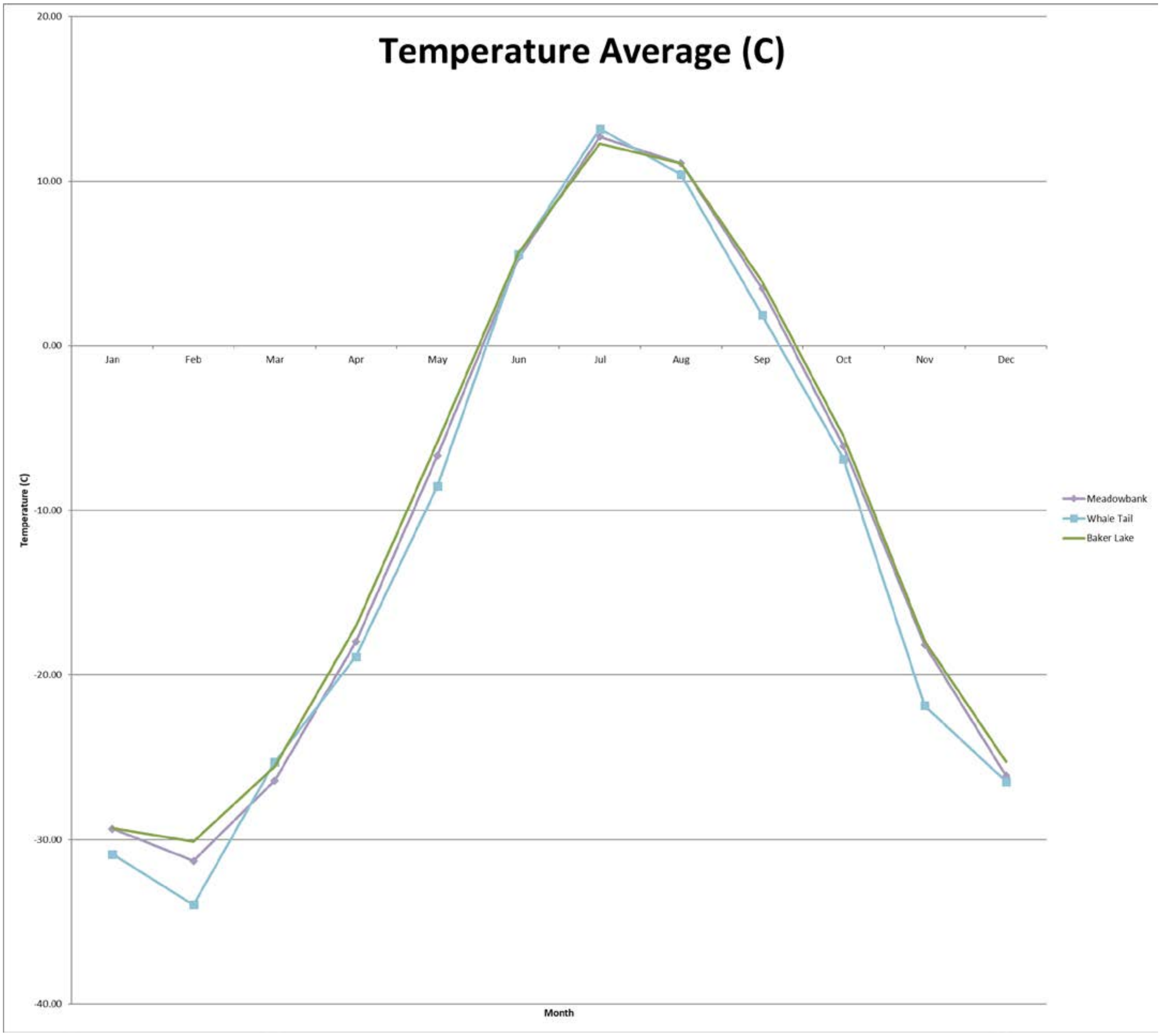


Figure 37 Historic Comparison Meadowbank, Whale Tail, Baker Lake Site Total Precipitation Average 2009-2020

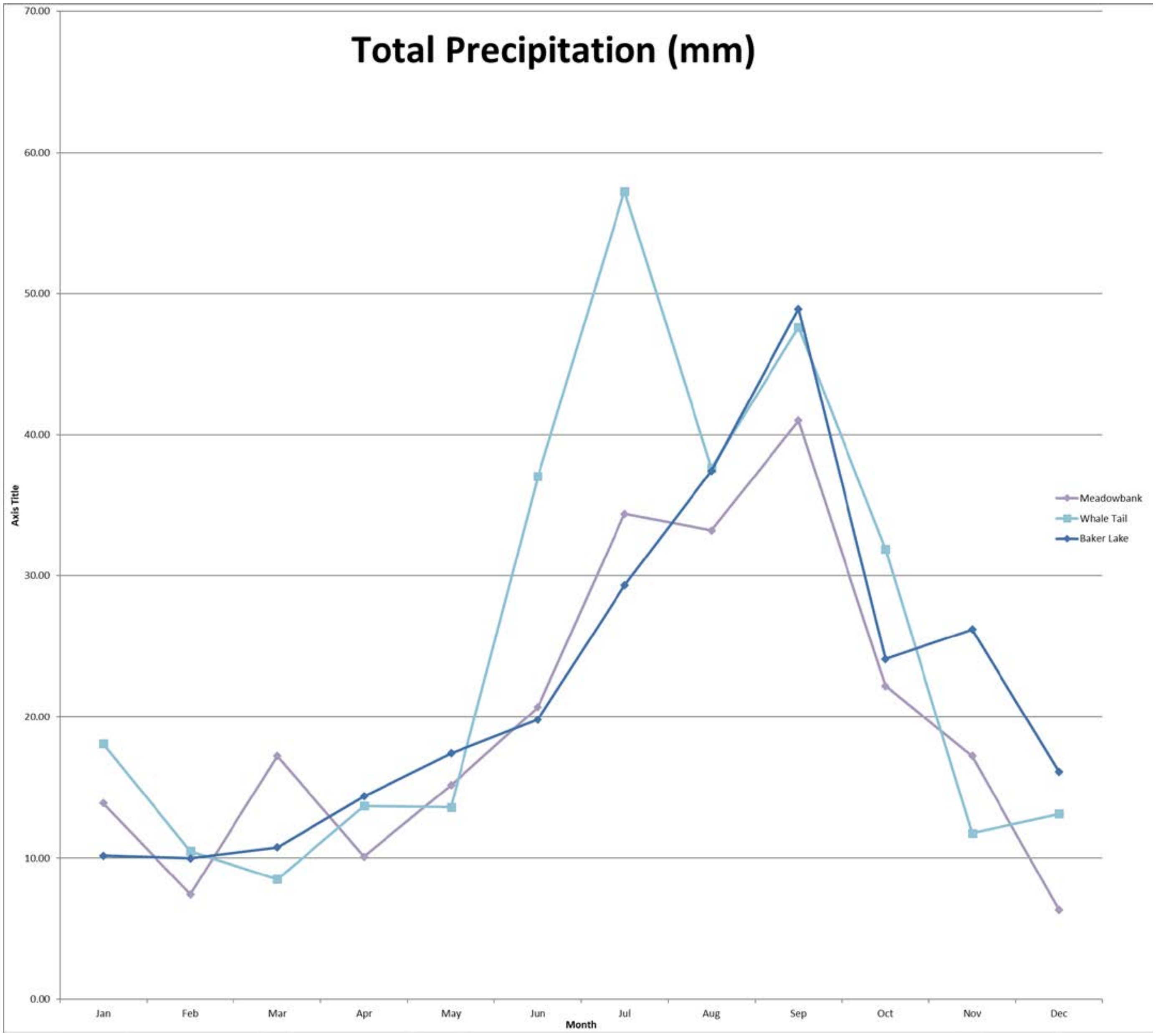
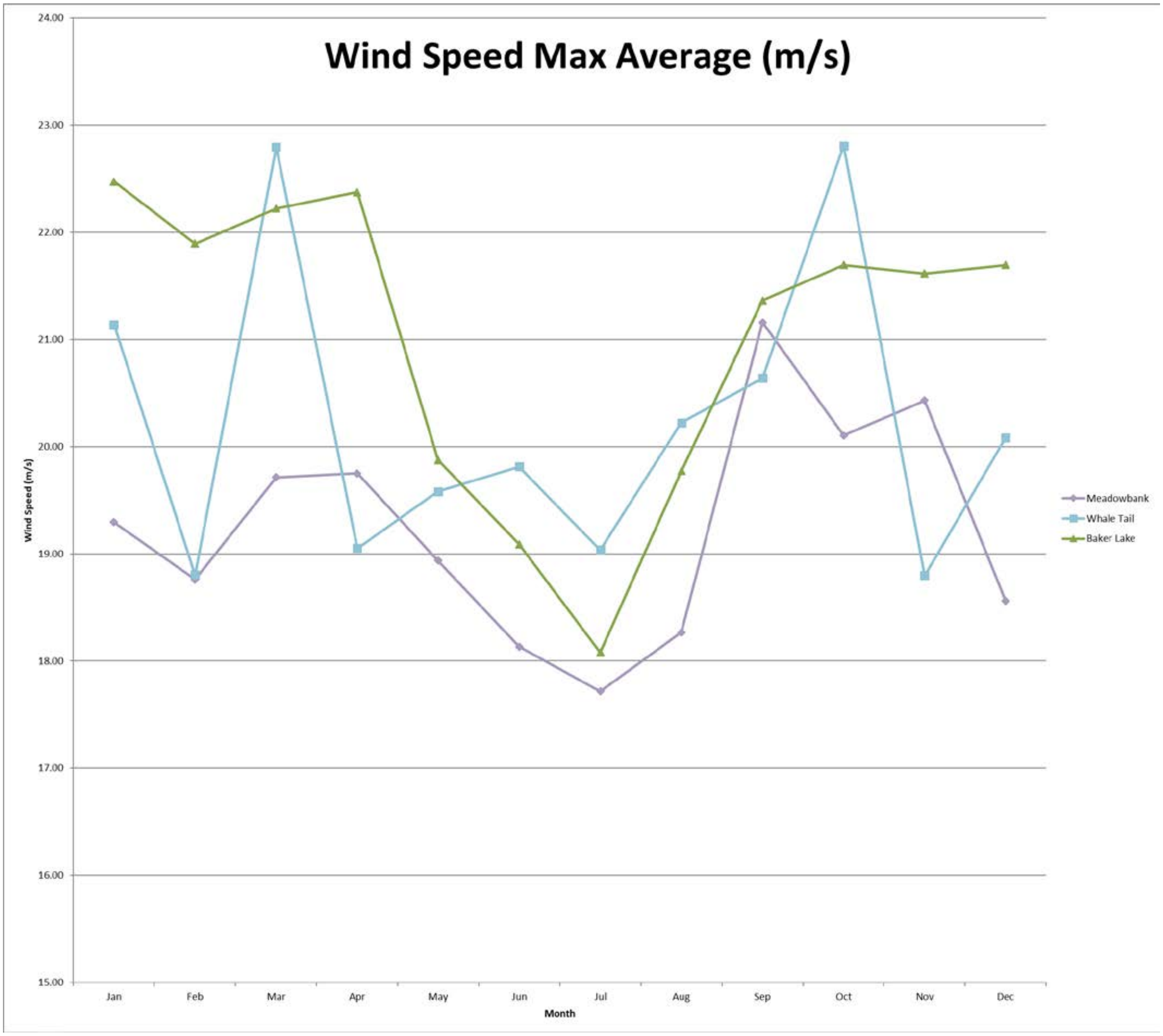


Figure 38 Historic Comparison Meadowbank, Whale Tail, Baker Lake Site Wind Speed Max Average 2009-2020



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-MEA1530 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 Eagle submitted the Meadowbank Interim Closure and Reclamation Plan dated May 29th, 2019 to CIRNAC on June 7th, 2019 and on July 24th, 2019 to the NWB. On March 2020, Agnico made a revision to the Meadowbank Interim Closure and Reclamation Plan – Update 2019 (Appendix 55 of the 2019 Annual Report) to address action items identified by the NWB during the review of the 2018 Annual Report.

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.

No progressive reclamation activities have been identified for the Baker Lake site facilities at this time, as the facilities will be required throughout the operation period and the active closure.

No progressive reclamation activities have been identified for the dikes and permanent structures at this time. Dewatering structures are required for operations in the open pits, for in-pit tailings deposition 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.

In-pit tailings deposition started in Goose Pit in July 2019 and started in Portage Pit E in August 2020. Following in-pit tailings deposition in Goose Pit, the reclaim water was transferred to Portage Pit and flooding has resumed with natural runoff. According to the inflow model, a total inflow of 389,350m^3 was accumulated in Goose pit in 2020, coming from runoff and groundwater inflows, excluding water transfers. This is higher than inflows in previous years, which reduces the requirement for mechanical flooding in closure. Pumping of water from the Third Portage Lake is planned during closure.

The flooding of Vault and Phaser/BB Phaser pits with natural flooding and active pumping are planned at the end of their operation; flooding started in 2019 and continued in 2020. The current reflooding with natural runoff is estimated at a rate of 0.54Mm^3 per year.

Following the end of in-pit deposition, the current closure plan involves the treatment and discharge of the reclaim water in the pits, followed by the installation of an aggregate cover on the tailings, if feasible, and pit flooding through natural runoff and water transfer from Third Portage Lake. A technical note compared forecasted reclaim water quality in Goose and Portage pits at the end of in-pit deposition against current/possible future discharge criteria (Appendix 50). Based on this assessment, the following parameters of concern in the reclaim water would require further treatment: Total dissolved solids (TDS), certain heavy metal, arsenic and ammonia. Ammonia concentration could be removed by natural degradation, while, heavy metals, arsenic and total suspended solids could be treated by conventional precipitation/coagulation process. The reduction in TDS, however, may require membrane technologies which could pose some technical challenges due to the high volume of water to be treated.

To continue the development and implementation of the closure water treatment system, a preliminary high-level strategy was developed and consists of the following main activities:

- Conduct bench scale laboratory and on-site testing to define the water treatment technologies required for closure;
- Realize environmental studies to assess the assimilative capacity of Third Portage Lake. The results from these studies will help define the allowable annual discharge volume and treated effluent requirements.
- Evaluate discharge location and diffuser design;
- Develop feasibility and detail engineering deliverables for the closure water treatment system.

A preliminary schedule was proposed for implementation of these activities and will be revisited annually based on the current mine site activities and planning, with bench scale work starting in 2021.

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 (Appendix 55 of 2019

Annual Report) for cover design details. Approximately 90% of the Portage PAG RSF has been covered as of the end of 2020. 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 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.

Progressive reclamation by capping the tailings in the North Cell was undertaken in winter of 2015 following the completion of the tailings deposition. The construction continued in 2016-2019. 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 2,022,415 m^3 of placed material. During in-pit deposition, there is an opportunity to progressively close the South Cell TSF. This option will be further evaluated by Agnico Eagle based on the current site condition, the in-pit tailings deposition and operating considerations at that time. 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. Additional details are available in Appendix E (Appendix 55 of 2019 Annual Report).

Following conversion of the Portage Attenuation Pond into the Reclaim Pond (South Tailings Cell) in 2014, some of the dewatering equipment from the North Cell reclaim system (i.e. dewatering pipelines, reclaim barge, effluent diffuser pipelines, and pumps) has been dismantled and removed. This activity occurred in 2015. Water management facilities or equipment not used or deemed not necessary could be removed during operations. Some water management systems not required at Meadowbank were moved at Whale Tail Pit based on availability and needs on both sites. The clarifiers of the Water Treatment Plant (WTP) at Meadowbank was demobilized partially to be used at Vault WTP. The Vault WTP was then demobilized to be installed at Whale Tail Pit.

Progressive reclamation activities for the buildings and equipment at Vault has occurred during operation after the mining activities. To date, the emergency camp and office at Vault have been removed. Specific timeline for progressive reclamation at Vault during operation will be eventually defined. Efforts are also made to reduce inventories of consumables leading up to the end of operations.

The landfill will be in active use throughout the operation period and also during the closure period in order to receive debris from decommissioning. Operation landfills are progressively closed in the Portage RSF during operation, but final closure of the demolition landfill will occur at the end of the active closure stage. The landfarm will be required in operations and active closure for soil decontamination. No specific progressive reclamation activities have been identified for the other waste disposal areas.

For more information regarding these activities, refer to the Interim Closure and Reclamation Plan – update 2019 (revision 1) found in Appendix 55 of the 2019 Annual Report

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 2020.

The quarries and granular borrow sites no longer required for operations will be progressively reclaimed during operation, as equipment and resources are available. Quarries and granular borrow sites are required for maintenance work on the AWAR. The AWAR is used in operation, but also in closure and post-closure. The road will be preserved as the main access to the site in a sufficient condition to allow post-closure access for monitoring, inspection and maintenance activities. Material availability and proper maintenance are required to ensure the good state of the road. A review of the available material and the schedule of planned maintenance will be done during operation to define a specific timeline for quarries progressive reclamation during operation. Inactive quarries and borrow pits could be progressively reclaimed during operation, in order to promote natural drainage and minimize the duration of environmental exposure in the vicinity of the AWAR.

9.1.1.3 *Quarries*

As required by CIRNAC Land Lease 66A/8-72-6, 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 2020.

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

9.1.2.1 *Mine Site*

As required by NWB Water License 2AM-WTP1830 Part J, Item 2: ***The Licensee shall submit to the Board for approval within three (3) years 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 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:***

- ***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***
- ***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-WTP1830 Schedule B, Item 20: ***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 Production Lease KVPL17D01 Condition 6.01 (10): ***Deliver to KIA, not later than March 31, 2022 and not later than March 31st every three (3) years thereafter, a Conceptual Reclamation and Closure Plan and Reclamation Estimate, detailing the reclamation and remediation activities taken in the last three (3) years and to be undertaken in the next three (3) years and planned for the balance of the Term. That includes, but not is not limited to the proposed methods and procedure for the progressive […]***

Agnico submitted an updated version of the Whale Tail Interim Closure and Reclamation Plan (ICRP) on July 2020 to NWB. Progressive closure of the WRSF occurred progressively during operations with the placement of the NPAG cover over the side slopes of the PAG RSF Other than that, there was no progressive reclamation completed in 2020 as the site was in fully operation in 2020 and also get the authorization for the development of the IVR pit and associated infrastructure. For details regarding the planned permanent and progressive reclamation, please refer to Section 5 and 6 of the Whale Tail ICRP provided in Appendix 51.

No reclamation work undertaken at Whale Tail mine site in 2020.

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 2020.

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 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 2020. Quarries/eskers may continued to be used in following year for construction project and road maintenance.

9.2 RECLAMATION COSTS

9.2.1 MEADOWBANK SITE

9.2.1.1 *Project Estimate*

As required by NWB Water License 2AM-MEA1530 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 (Appendix 55 of the 2019 Annual Report):

- 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 was required to submit a detailed financial security cost estimate for the Meadowbank ICRP - Update 2019 to Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) and to the Kivalliq Inuit Association (KivIA) 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 Indigenous and Northern Affairs Canada, Mackenzie Valley Land and Water Board and the Government of the Northwest Territories (INAC, MVLWB, GNWT, 2017).

This cost estimate provides for the closure measures described in detail in the Meadowbank ICRP – Update 2019. The schedule of closure activities, presented in Appendix P of the ICRP presented in Appendix 55 of the 2019 Annual Report, 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 (up to 2017) are considered in the calculations.

The updated 2019 estimated closure and reclamation costs for the Meadowbank Project represent a total of $89,427,746. This total includes $62,269,580 of direct costs and $ 27,158,166 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 (Appendix 55 of 2019 Annual Report).

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/8-72-6, 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 2020.

No modifications were made in the last updated interim closure plan from 2019 (Rev 1) compared to the previous version. The cost estimate for the reclamation of the AWAR and quarries cost estimated is C$993,078.

9.2.2 Whale Tail Site

9.2.2.1 *Project Estimate*

As required by NWB Water License 2AM-WTP1830 Schedule B, Item 22: *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-WTP1830 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). As part of the Whale Tail Expansion Project, an updated ICRP was submitted in July 2020.

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 2020 estimated closure and reclamation costs for the Whale Tail Project represent a total of C$50,663,508. This total includes C$30,714,735 of direct costs and C$19,948,773 of indirect costs.

As per NWB Water License Part C Item 1, Agnico has provided to both the Government of Canada (CIRNAC) and KivIA a Letter of Credit in the amount of C$25,331,754 for a total of C$50,663,508.

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 included in the Whale Tail ICRP. As per the 2019 Whale Tail ICRP Rev 1, active revegetation has not been planned at this time as part of the reclamation plan given the cold climate setting of the Project. Furthermore to below, Meadowbank had in 2020 a baccalaureate student that make his internship to assess the possibility of revegetation in Northern Arctic Condition. Result of this study will be reported in subsequent annual report and will be use to fulfill NIRB Condition 13 and 26. An update to the ICRP will be completed, as needed.

Agnico Eagle Meliadine Mine Site, as per the 11MN034 Project Certificate Condition 20 and 41, need to undertake a similar study as required by the Whale Tail Project Certificate 008 Condition 13 and 41.

Result of the study conducted by Meliadine mine site will be shared with Meadowbank in order to fulfill the current Project Certificate No. 008 obligations. Below is a summary of the study conducted in 2018-2020 at Meliadine.

On June 1st, 2018 Agnico Eagle Mines and the University of Saskatchewan were successful in receiving a Natural Sciences and Engineering Research Council (NSERC) Collaborative Research and Development grant. The grant entitled "Tundra Restoration: Niche construction in early successional plant-soil systems" will support on-site and laboratory research from June 2018 to June 2022. The primary objective of this research is to address Term and Condition no. 41 of the Project Certificate for the Meliadine site: "Prior to the commencement of operations, the Proponent shall develop a progressive re-vegetation program for disturbed areas that are no longer required for operations, such program to incorporate measures for the use of test plots, reseeding and replanting of native plants as necessary."

Several additional scientific objectives that support this primary objective are also examined within the research project :

- Characterization of initial and realized niches of biological soil crusts and tundra vascular plants across a chronosequence of naturally recolonized drilling waste dumps;
- Characterization of initial and realized niches of actively restored biological soil crusts on disturbed substrates;
- Characterization of initial and realized niches of actively restored tundra vascular plants on disturbed substrates.

In addition to the scientific work, the research project includes the development of a youth education program and local community engagement in Rankin Inlet and Baker Lake, NU.

Work started during the 2018 summer and continued in 2019, with the establishment of three restoration trials to monitor the success of transplanting intact and shredded tundra material on disturbed areas associated with the Meliadine mine site. Restoration sites at Quarry 1 and 2 are located at ~27 km on the All Weather Access Road (AWAR), and a third site was located at the quarry area before the emulsion plant on site. To complement this field trial a tundra plug expansion trial in growth chambers was conducted at the University of Saskatchewan from January 2020 to June 2020. In 2019, a field study examining early colonizing Oxytropis species that have been identified as potential local native species for restoration was also initiated.

Field and laboratory activities in 2019-2020 also continued to characterize initial and realized niches of biological soil crusts (BSCs) and tundra vascular plants across a chronosequence of naturally recolonized drilling waste dumps and an extensive invasive plant species survey was conducted in summer 2019 during which no non-native invasive species were observed or identified.

In the summer 2020, due to the COVID-19 pandemic and related travel restrictions, University of Saskatchewan field work at Meliadine was cancelled and postponed to summer 2021. As communicated to NIRB June 11th 2020, University of Saskatchewan confirmed postponing the field work to summer 2021 shouldn't have significant impacts on the project, and project related activities continued remotely.

Additional resources were allocated to the tundra plug expansion trial in 2020 to gain information regarding patterns of species growth and expansion from the plugs and better understand plant-soil interactions of these expanding communities. Preliminary results indicate that initial plug expansion is occurring primarily belowground and fertilization of substrate adjacent to transplanted plugs significantly increases belowground biomass and rooting distance. Oxytropis species in tundra plugs from 2018 have been maintained and together with southern Oxytropis will provide the needed materials for methods development and initial growth chamber trials in winter 2021.

Natural revegetation of drilling wastes is occurring at the Meliadine site with community composition between drilling wastes and the paired undisturbed tundra similar 20-25 years post disturbance. Due to the different life history characteristics of tundra plants, individual species responses to disturbance were observed. While sedges and mosses may recover more rapidly on these drilling wastes, dwarf shrubs and lichens may require longer to recover. These trends in natural recovery are important for guiding future restoration efforts and techniques. Specifically, targeting sedge and moss species for transplanting and/or seeding of disturbed substrates may be a highly effective strategy for initiating the development of early successional tundra communities.

Based on their findings, University of Saskatchewan provided the following suggestions to improve and/or maintain the relatively rapid natural revegetation of the drilling wastes: i) Placement of drilling wastes on the landscape that allow for remnant patches or islands of intact tundra throughout the disturbed area; ii) Apply drilling wastes in layers to allow for vegetative establishment; and iii) Promote establishment of bryophyte communities in the early stages of revegetation to support long-term ecosystem recovery.

The finding of the University of Saskatchewan study shows that active restoration of the drilling wastes at Meliadine is likely not required for the recovery of the tundra plant communities, if the timeline for recovery is ~20 years.

More information on the research project can be found on the following website: https://www.tundrarestoration.com/ and the October 2020 Tundra Restoration and Natural Recovery Monitoring Technical Report can be found in Appendix 32 of Meliadine 2020 Annual Report.

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 11th, 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 the 2018 Annual 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; and***
- ***Includes a Workforce Transition Plan between the Whale Tail Project and other production mines owned and operated by the Proponent in the Kivalliq region.***

The Proponent shall advance the recommendations of the Conceptual Socio-economic Closure Plan through the development of a Final Socio-economic Closure Plan that will be part of the Whale Tail Pit Project Final Closure and Reclamation Plan.

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.

In accordance with their Project Certificate, Agnico Eagle prepared, in 2019, a conceptual Socio-economic Closure Plan "to ensure workers at the project would be supported once operations cease". Socio-economic closure planning in the context of Agnico Eagle's Kivalliq operations is an integrated process that considers the schedules, workforces and contributions of Meadowbank, Whale Tail and Meliadine. In the past years, Agnico Eagle undertook several studies, engagements and consultations to inform the development of the Conceptual Closure Plan.

In 2020, Agnico Eagle aimed to demonstrate progress on its Conceptual Socio-Economic Closure Plan, with the intent of developing a final Socio-Economic Closure plan. The company worked in this direction by creating a formal Project Charter to outline the process to follow. While following recognized project management structure such as a listing of main challenges, objectives with clear performance indicators, work description, assumptions, constraints, multi-stakeholder management plan, success factors, deliverables and high-level schedule, Agnico Eagle kept in mind the importance of continuously adjust that plan through time.

Agnico Eagle believes that this adjustment will be possible by following guiding principles. Those principles are leading specific goals that need consultation and collaboration with communities and government bodies as the Socio-Economic closure planning process continues. All that, while staying aware of communities' socio-economic evolution and potential priorities shift from community and government.

Guiding criteria for closure-specific in the Kivalliq context followed by Agnico Eagle, as stated by Golder (2019):

1. Locally-Driven
2. Opportunity-Based
3. Sustainable
4. Resilient
5. Planned for success

In future years and depending on socio-economic evolution, priorities and mine operations, next tentative closure planning activities will focus on the implementation of closure plan project, the communication of Agnico Eagle's approach to closure planning, the plan refinement with identified community groups and stakeholders, and the implementation of task-specific plans including economic assessment.

SECTION 10. PLANS / REPORTS / STUDIES

10.1 SUMMARY OF STUDIES

10.1.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1530 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 2020.

10.1.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1830 Schedule B, Item 23: ***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 2020.

10.2 SUMMARY OF REVISIONS

10.2.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1530 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-MEA1530 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-MEA1530 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.

The following monitoring and management plans were revised in 2020 and apply to Meadowbank Site:

- Mine Waste Rock and Tailings Management Plan, Version11 (Appendix 22);

- 2020 Water Management Report and Plan Version 9 (Appendix 11);
- Landfill Design and Management Plan Version 4 (Appendix 58); and
- Oil Handling Facility: Oil Pollution Emergency Plan, Version 13 (Appendix 32).

The following monitoring and management plans were revised in 2020 and apply to both Meadowbank and Whale Tail sites:

- Bulk Fuel Storage Facility Management Plan Version 6 (Appendix 17)
- Ammonia Management Plan Version 3 (Appendix E of the Water Management Plan);
- Hazardous Materials Management Plan, Version 6 (Appendix 55);
- Blast Monitoring Program, Version 6 (Appendix 40);
- Spill Contingency Plan, Version 13 (Appendix 27);
- Emergency Response Plan, Version 16 (Appendix 31); and
- Quality Assurance / Quality Control (QA/QC) Plan, Version 6 (Appendix 54).

The above listed plans are in their respective appendix. A brief description of revisions made to each of plans is provided in the Control Document at the beginning of each plans.

10.2.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1830 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-WTP1830 Schedule B, Item 24: ***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-WTP1830 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.

The following monitoring and management plans were revised in 2020 and apply to Whale Tail Project:

- Water Quality Monitoring and Management Plan for Dike Construction and Dewatering, Version 3 (Appendix 59);
- Whale Tail Interim Closure and Reclamation Plan, Version 4 (Appendix 51);
- Landfill and Waste Management Plan, Version 4 (Appendix 16);
- Whale Tail Pit ARD-ML Sampling Plan, Version 6 (Appendix 21);
- Waste Rock Management Plan, Version 5 (Appendix 25); and
- Water Management Plan, Version 6 (Appendix 12).

The above listed plans are in their respective appendix. A brief description of revisions made to each of plans is provided in the Control Document at the beginning of each plans. 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 14th, 2018 to NIRB, which includes information on the inclusion of sexual health and well-being during employee orientation. The last updated Occupational Health and Safety Plan is included in the Appendix 51 of the 2018 Annual Report.

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 is included in the Appendix 62 of this 2020 Annual Report.

10.3 EXECUTIVE SUMMARY TRANSLATIONS

10.3.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1530 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 2020 for Meadowbank site:
  - 2020 Annual Review of Portage and Goose Pit Slope Performance;
  - 2020 Landfarm Report;
  - 2020 Thermal Monitoring Report;
  - 2021 KVPL02D280 Mine Plan;
  - Closure Water Treatment Strategy
  - 2020 Groundwater Monitoring Report; and
  - 2020 Quarry 22 Report.
- Reports or studies submitted in 2020 for both Meadowbank and Whale Tail sites:
  - 2020 Meadowbank Dike Review Board No. 26, 27, and 28 Reports;
  - 2020 Annual Geotechnical Inspection Report;
  - 2020 Wildlife Monitoring Summary Report;
  - NIRB Screening Decision Addendum 2020 Annual Report
  - 2020 Marine Mammal and Seabird Observer (MMSO) Report;

- o 2020 Socio-economic monitoring Report;
- o 2020 Core Receiving Environment Monitoring Program Report;
- o 2020 Blast Monitoring Report;
- o 2020 Air Quality and Dustfall Monitoring Report;
- o 2020 Noise Monitoring Report; and

10.3.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1830 Schedule B, Item 25: ***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 Item 9: ***The Proponent shall make significant monitoring results and/or summaries of significant results available in English, Inuinnaqtun, and Inuktitut, to the extent feasible.***

Appendix 53 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 2020 for Whale Tail site:
  - o 2020 Thermal Monitoring Report;
  - o 2020 Annual Pit Slope Performance Report;
  - o Quarry KVCA15Q01 – 2021 Work Plan;
  - o Quarry KVCA15Q02 – 2021 Work Plan;
  - o Quarry KVCA18Q01 – 2021 Work Plan;
  - o WTHR KVRW15F01 – 2021 Work Plan;
  - o 2021 KVPL17D01 Mine Plan;
  - o 2020 Dike Construction and Dewatering Report;
  - o 2020 IVR Fishout Report;
  - o 2020 Fish Habitat Offset Monitoring Report

- o 2020 Groundwater Report; and
- o 2020 Report on the Implementation of measures to avoid and mitigate serious harm – Whale Tail Pit Project.

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-MEA1530 Schedule B, Item 14: ***A summary of modifications and/or major maintenance work carried out on all water and waste related structures and facilities.***

There was no major modification or maintenance work in 2020 at Meadowbank.

11.1.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1830 Schedule B, Item 17: ***A summary of Modifications and/or major maintenance work carried out on all Water and Waste-related structures and facilities.***

Refer to Section 11.2.2 Whale Tail Pit Expansion Project below. Other than that, there were no major modifications or maintenance work in 2020 at Whale Tail. Refer to Section 3.5.2.2 for a list of the Construction Summary Reports submitted in 2020.

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

Permitting for in-pit disposal of tailings was completed in 2019. No permitting was done in 2020.

11.2.2 Whale Tail Pit Expansion Project

Agnico Eagle currently operates the Meadowbank Mine and the Whale Tail Pit Project. Agnico Eagle proposed to expand and extend the Whale Tail Pit Project to include:

- Expansion of the Whale Tail Pit
- 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 15th, 2018. On October 16th, 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 23rd, 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 18th, 2018. Information requests were received on February 21st, 2019 and technical review comments were received on May 15th, 2019. A technical meeting was held in Baker Lake from June 11th to 13th, 2019. Final written submission were received on July 30th and a public hearing was held in Baker Lake from August 26th to 29th, 2019. The NIRB submitted its reconsideration report on October 19th, 2019 and forwarded its positive recommendation to the minister. As of January 20th, 2020, Agnico Eagle received positive ministerial decision and NIRB issued on February 19th, 2020 amendment and addition to Terms and Conditions of the Project Certificate to reflect modifications to the Whale Tail Pit Project as proposed in the Whale Tail Pit Expansion Project

Parallel to this, Agnico Eagle submitted an application to amend Water Licences 2AM-MEA1526, 2AM-WTP1826 and 2BB-MEA1828 to the Nunavut Water Board on May 16th, 2019. Information requests were received on July 18th, 2019 and technical review comments were received on September 16th, 2019. A technical meeting and pre-hearing conference was held in Yellowknife (due to weather conditions) on October 29th-30th, 2019. As a result of commitments made during the Technical Meeting, Agnico Eagle submitted a number of documents to the NWB on December 20th, 2019. They included revised modeling results, the WRSF final design report and a revised ICRP. The final NWB public hearing was conducted in Baker Lake from February 12th to 13th, 2020. The NWB submitted its decision report on March 27th, 2020 and forwarded its positive decision to the Minister. As of May 12th, 2020, Agnico Eagle received positive ministerial decision and NWB issued on May 14th, 2020 amended Water Licence to reflect modifications to the Whale Tail Pit Project as proposed in the Whale Tail Pit Expansion Project.

Further to NWB decision, DFO issued Whale Tail Expansion Project Fisheries Act Authorization on July 2017 and, on July 2020, Agnico Eagle received approval of the Fish Habitat Compensation Plan Associated with the Listing of specified waterbodies in Schedule 2 of the Metal and Diamond Mining Effluent Regulations (MDMER) for the Whale Tail Pit Expansion Project.

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 completed by Agnico Eagle in 2020 on the Amaruq Property comprised delineation, conversion, geotechnical and service targets. Drill holes done on the Amaruq property in 2020 resulted in an improved geological model, a better understanding of the local geology and expansion of the Whale Tail and IVR zones. This work was based out of the Amaruq camp, a satellite mining camp situated approximately 50 kilometers north-northwest of the Meadowbank mine site. The 2020 drilling campaign totalled 392 diamond drill holes totalling 43,582 meters. Particular attention was paid to the delineation drilling of the IVR phase 1 and Whale Tail pit in the first phase of the 2020 drilling campaign. More conversion and delineation drilling of potential small pits in the eastern extension of Whale Tail and the western extension of IVR was undertaken later on in the drilling campaign. An Underground campaign occurred, mainly to define the proper position of the footwall and for geotechnical purposes.

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 and again in January 2019. In 2020, Agnico Eagle completed a self audit of the ICMC principals and standards.

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 and are also online www.aemnunavut.ca/documents/.

As per previous years shipments, the transport of cyanide in 2020 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. Baker Lake community stakeholders were advised of scheduled transportation plans in August and September 2020, and the public was kept advised of road closures on radio and Facebook throughout the transportation process. In 2020, two (2) convoys containing 35 sea cans of cyanide was needed during the barge season.

Agnico maintains its compliance with ICMC requirements, and a full third-party audit of the Meadowbank Complex and its Supply Chain will be completed in 2021. The full certification information can be found at:

https://www.cyanidecode.org/sites/default/files/pdf/AgnicoEagleMeadowbankMineSAR2019.pdf

As part of the International Cyanide Management Code (ICMC), Agnico is required to inform the community of Baker Lake and Chesterfield, details regarding the cyanide shipping and transportation along the All Weather Access Road (AWAR), along with associated restrictions that apply to hamlet residences with regard to the usage of the AWAR. Due to COVID restrictions in 2020, a general meeting with the public was not completed. The Baker Lake Community Liaison and Community relations team provided notices and updates regarding the cyanide transportation on social media and radio announcements.

11.5 INSPECTIONS AND COMPLIANCE REPORTS

11.5.1 Meadowbank, Whale Tail and Exploration

As required by NWB Water License 2AM-MEA1530 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-WTP1830 Schedule B, Item 26: ***A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector.***

11.5.1.1 *CIRNAC*

CIRNAC Inspector conducted inspections of the Meadowbank and Whale Tail Water Licences (2AM-MEA1530 and 2AM-WTP1830), AWAR Quarry Lease 66A/8-72-5 and WTHR Quarry Lease 66H/08-01-3 on October 1st , 2020. Purpose of this visit was to ensure compliance with the term and condition of these license/lease. Due to COVID-19 restrictions, the inspection was conducted without any Agnico Eagle representative and was only performed on the road. On March 2nd and 3rd, 2021 the inspection reported were received.

Non-compliance related to Water License 2AM-MEA1530 Part E, Item 11 and 2AM-WTP1838 Part E, Item 12 was observed. As per the inspection reports, concerns related to erosion and deposition of sediment into water course was observed at certain bridges along the AWAR and WTHR. Agnico will provide the Inspector with a summary of the maintenance that will be completed this year on all the water crossings to prevent further sediment from entering the water course. This summary is due July 1st, 2021.

Non-compliance related to AWAR Quarry Lease 66A/8-72-5 and WTHR Quarry Lease 66H/08-01- and 2AM-WTP1838 Item 40 was observed. Garbage and waste were observe in some of the quarries along the AWAR and WTHR. Agnico need begin to clean up of garbage/waste that is found inside the quarries listed in the inspection reports before the term of the next Lease inspection. Agnico will submit a brief summary of the quarry clean-up activities to the inspector before July 1st, 2021.

On October 2nd, 2020 the inspector conducted an inspection of the Baker Lake Oil Handling Facility and also observed the tank farm leaking into the secondary containment.

11.5.1.2 *Environment and Climate Change Canada*

ECCC did not conduct any inspections in 2020.

11.5.1.3 *Kivalliq Inuit Association*

KivIA did not conduct any inspections in 2020.

11.5.1.4 *Nunavut Impact Review Board*

The annual NIRB inspection of the Meadowbank and Whale Tail site was conducted virtually in 2020 due to COVID-19 restrictions. Agnico prepared a virtual tour in the form of discussion with NIRB, updates and photos of the site. NIRB completed an combined inspection report for Meadowbank and Whale Tail that was received October 20th, 2020. The report can be access from NIRB Public registry: www.nirb.ca/project/125253.

Agnico also received on December 3rd, 2020 the Nunavut Impact Review Board's 2019-20 Annual Monitoring Report for the Meadowbank Gold Project and the Whale Tail Pit Projects and the 2019-2020 Annual Monitoring Report for Meadowbank Gold Mine and Whale Tail Pit Projects. Agnico have provided to NIRB responses to their concern along with the responses to the with Board's Recommendations provided on February 3rd, 2021. Agnico's responses can be found on the NIRB public registry.

11.5.1.5 *HTO*

HTO conducted surveys almost daily on the AWAR during caribou migration. However, due to COVID pandemic restriction no site visit was authorized in 2020.

11.5.1.6 *Government of Nunavut – Conservation Officer*

There were no inspections conducted by the GN in 2020.

11.5.1.7 *DFO*

DFO did not conduct any site inspections at Meadowbank and Whale Tail in 2020.

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 2020, there were two total suspended solids exceedances at ST-5 and ST-6 (diversion channel) in June. TSS results for both stations did not exceed the maximum allowable grab sample concentration (30 mg/L) permitted by the Water License 2AM-MEA1530, Part F, Item 7. Both stations did exceeded the maximum monthly average concentration (15 mg/L). Daily TSS analysis performed at the onsite laboratory show that TSS remained below 5 mg/L for most of the month. Refer to Section 8.5.3.1 above for more details.

11.6.2 Whale Tail Site

As required by NIRB Project Certificate No.008 Item 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.***

Two (2) MDMER non-compliance occurred at ST-MDMER-11 in 2020. These non-compliance were also included in the monthly NWB reports.

- On November 16th, Agnico conducted water quality monitoring as required by Section 12 (1) of the MDMER regulation. Radium 226 and cyanide were not analyzed for the weekly ST-MDMER-11 effluent sample. Cyanide is not required for Whale Tail as per Section 12 (3) but is conducted as due diligence.

  Upon review of the results, a request to provide the missing parameter results was sent to the accredited laboratory on December 22nd and this is when Agnico was made aware of the situation. The sample was received by the laboratory with all the associated bottles for the analysis required, however there was an error in the analysis request and therefore Ra226 and cyanide were not analyzed. The lab should have notified Agnico of the issues with the request as the bottles sent did not match the request they received. The lab did not notify Agnico of the discrepancies as required upon receipt of the sample.

The lab informed Agnico there was not enough sample left to complete the analysis of Ra226 or cyanide as they do not keep any extra bottles that are received.

The issue has been discussed and addressed between Agnico Eagle and the lab who was responsible for advising Agnio properly when there are discrepancies between the analysis request and the number of bottles received. Discussions with the field technicians took place to stress the importance of the regulatory samples and overall requirements. This will ensure compliance to the MDMER regulation in the future. ECCC inspector was notified on December 22nd, 2020.

- No sample was collected as per MDMER Section 12(1) and Water License 2AM-WTP1830 for the Whale Tail Attenuation Pond discharge to Whale Tail South (ST-MDMER-11/ST-WT-24b) during the week of December 13th to 19th. The regulatory sample was planned for December 14th; however the discharge was stopped early in the morning (and remained off for the week, therefore the sample was not collected.

  The discharge was shutdown due to increasing Turbidity/TSS trends in the Whale Tail Attenuation Pond raw water (before treatment) caused by the water level in the attenuation pond getting lower. To ensure optimal water treatment, the water treatment plant and the discharge were stopped as a preventive measure. Attempts to restart the discharge by the end of the week was done however, when the discharge was to be restarted it was noticed that there was a buildup of sediment in the tanks. Before starting the discharge, the sediment buildup needed to be addressed. ECCC inspector was notified on December 22nd, 2020

Four (4) blast exceedances also occurred in 2020. Refer to Section 8.6 above for more details

- One (1) exceedance was recorded at Mammoth Station for the 5116PSW60 with 14.6 mm/s in July 10th, 2020. For this blast, eight (8) preshear holes were detonated on the same delay. 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.

- Three (3) exceedances were recorded at the Whale Tail South Channel construction site on January 27, February 5 and February 10. Agnico Eagle advised DFO following each events, in a delay of 72h, to detail the cause and mitigation measures put in place. All the exceedances were observed at the SWTC-2 station. The completed explanation are provided in Appendix A, B and C of the report entitled “2020 Meadowbank and Whale Tail Blast Monitoring Report for the Protection of Nearby Fish Habitat” attached as Appendix 41.

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 2020 is provided in Table 11-1. In 2020, 2,223 non-mine authorized road uses were recorded (drivers and passengers). This is similar to 2019. Table 11-2 below show the ATVs and snowmobiles usage from 2012-2020. In 2020, no incidents occurred.

On May 8th, 2020, Baker Lake community members were informed of measure needed to be implemented to ensure the safety of all Nunavummiut regarding the use of the All-Weather Access Road (AWAR) during Covid-19. Since the AWAR is used by Nunavummiut for numerous reasons such as the practice of traditional activities, the decision was made that an employee from Baker Lake would work at the gatehouse as a dispatcher. Some specific measures related to the pandemic were implemented to ensure that the no-contact procedure was maintained between on-site employees and community members. Agnico also repeated safety information and AWAR procedure during the Community Liaison Committee meeting in Baker Lake. Additionally to Facebook posts on the AWAR, the community could access the procedure and road status via the website www.aemnunavut.ca/community/roads.

Table 11-1 2020 Monthly AWAR ATVs and Snowmobile Usage Records

Month	# of ATV's (drivers and Passengers)
January	0
February	0
March	0
April	1
May	6
June	452
July	235
August	488
September	571
October	421
November	49
December	0
Total 2020	**2,223**

Table 11-2 2012-2020 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
2019	2,163
2020	2,223

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:***

1. ***total number of loads hauled in that year***
2. ***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. The Security staff monitors the safety, traffic and security of all personnel using the road. Table 11-3 below shows the traffic data for 2020 along the Whale Tail Haul Road. Total one-way traffic along the WTHR included 40,432 long-haul, 4,342 medium equipment, and 5,667 light equipment vehicles, for a total of 50,441 vehicles. Monthly vehicle traffic for the WTHR were relatively constant throughout the year, except for April when caribou were migrating through the Project and road closures to non-essential vehicles were implemented and traffic volume was reduced in response to the COVID-19 restrictions.

Table 11-3 Whale Tail Haul Road 2020 Traffic Data

Month	Haul	Medium Equipment	Light Equipment	Total
January	3,136	378	618	**4,132**
February	2,784	421	642	**3,847**
March	2,162	381	592	**3,135**
April	0	190	359	**549**
May	2,540	317	404	**3,261**
June	3,170	252	407	**3,829**
July	4,316	380	591	**5,287**
August	4,112	324	435	**4,871**
September	4,570	457	419	**5,446**
October	4,480	478	384	**5,342**
November	4,822	454	462	**5,738**
December	4,340	310	354	**5,004**
Total	40,432	4,342	5,667	**50,441**

The haul road traffic volumes for the Expansion Project are consistent with those applied to the Approved Project FEIS Volume 4, Appendix 4-B, Table 4-B-15 (Agnico Eagle 2016c). Table 11-4 below provided the FEIS daily vehicle traffic on the haul road based on an estimated number of days that there will be traffic on the road is 337 days. In 2020, the road was close for wildlife migration for a total of 16 days, and thus the road was open for a total of 349 days. In order to make comparison to FEIS, explosive truck, fuel, cargo and oversize were categorized as medium equipment. Pickup and bus were categorized as light equipment. Based on data collected in 2020, there is currently no exceedance to the FEIS as per the Table 11-5.

Table 11-4 FEIS Daily Vehicle Traffic on the Haul Road

Category	Lower 5%	Average	Upper 95%
Long Haul	64	154	173
Explosive	2	4	5
Fuel	1	2	4
Cargo	4	7	10
Pickup	12	20	26
Bus	0	2	4
Oversize	0	1	4

Table 11-5 2020 Daily WTHR Traffic Comparison to Average FEIS

Category	FEIS	2020 Data
Long Haul	154	115
Medium Equipment	14	12
Light Equipment	24	16

There is no non-mine uses of the Whale Tail Haul Road by any local as the road is closed 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. Following consultation with HTO in 2019, it has been determined that no more locations for Traditional Land Use Crossings needed to be implemented along the WTHR.

Here is some specification regarding the crossing:

-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; and

-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 2020, 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.

11.7.2 Safety Incidents

11.7.2.1 *AWAR Meadowbank Site*

As required by NIRB Project Certificate No.004 Condition 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.***

In 2020, due to COVID-19 pandemic and community restrictions no Open House sessions were held in Baker Lake to review AWAR and WTHR procedure and safety practices. However, Agnico Eagle continued to remain connected to communities via Facebook – updates on road closures and AWAR procedures were posted there. The Baker Lake community can also access the AWAR procedure via the website www.aemnunavut.ca/community/roads.

A teleconference was held on August 26th, 2020 with the Baker Lake Hamlet, HTO, Fire Chief, RCMP and Baker Lake Health Center to present about the 2020 Cyanide Transportation. Due to COVID-19 exceptional circumstances, Agrico Eagle was not able to hold the usual community information meetings in person. During the teleconference, the 2020 Cyanide transportation safety and monitoring procedures were presented as well as the communication plans. In addition, Agnico Eagle presented the COVID-19 measures undertaken during the transportation to ensure minimal impact on the surrounding community.

More details on the 2020 Sealift Season & Cyanide Transportation can be found in Appendix 56.

In response to COVID-19, Agnico Eagle developed a 'Gatehouse Isolation' procedure to ensure Baker Lake gatehouse Nunavummiut employees maintain distance and isolation from mine employees. In 2020, there been no incident reported involving non-mine authorized vehicles and no accidents to date involving mine related truck traffic and locals using ATV's/snowmobiles.

In 2020, there were four (4) environmental spills that occurred along the AWAR. Table 7-3 provides details on this spill. The spill was managed appropriately according to Agnico's spill contingency plan. The spills were remediated, and contaminated material was deposited at the Meadowbank Complex landfarm. There were no impacts to any watercourses.

In 2020, there was one (1) wildlife mortality along the AWAR. It was a male juvenile Caribou, the exact cause of death is unclear, but due to the proximity to the road and some evidence of trauma Agnico Eagle assumes there may have been an interaction with traffic.

All the incident/mortality reports can be found in 2020 Wildlife Monitoring Summary Report (Appendix 47).

To continue avoiding 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.***

As required by NIRB Project Certificate No 008 Amendment 001 Condition 66: The Proponent shall operate the Whale Tail haul road as a private access road, implement any reasonable measures to limit public access to the road, and develop strategies that account for unauthorized use. These measures must include, but are not limited to, the following:

> ***a) The posting of signs in English and Inuktitut at the gate, each major bridge crossing, and each 10 kilometres of road, stating that public use of the road is prohibited;***
>
> ***b) Annually advertise and hold at least one community meeting in the Hamlet of Baker Lake to explain to the community that the road is restricted to mine use only;***
>
> ***c) Place local notices (e.g., radio, television, social media) at least quarterly to explain to the community that the road is restricted to mine use only;***
>
> ***d) Record all unauthorized 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,***
>
> ***e) Develop management strategies to ensure public and operator safety in the event of unauthorized public use.***

On May 8th, 2020, Baker Lake community members were informed of measure needed to be implemented to ensure the safety of all Nunavummiut regarding the use of the All-Weather Access Road (AWAR) during Covid-19. Since the AWAR is used by Nunavummiut for numerous reasons such as the practice of traditional activities, the decision was made that an employee from Baker Lake would work at the gatehouse as a dispatcher. Some specific measures related to the pandemic were implemented to ensure that the no-contact procedure was maintained between on-site employees and community members. Agnico also repeated safety information and AWAR/WTHR procedure during the Community Liaison Committee meeting in Baker Lake. Additionally to Facebook posts on the AWAR, the community could access the procedure and road status via the website www.aemnunavut.ca/community/roads.

No incident involving non-mine authorized use occurred in 2020.

There have been no accidents to date involving mine related truck traffic and locals using ATV's/snowmobiles.

A total of twelve (12) environmental spills occurred along the Whale Tail Haul Road in 2020. 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 2020, there were no mortality project-related along the Whale Tail Haul Road. To continue to avoid 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 2020 that may impact the local usage as the road is not public. There were road closures due to bad weather and wildlife migration (Wildlife Summary Report Appendix 47) 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 adverse 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 the Shipping Management Plan in advance of the 2018 shipping activities. Agnico Eagle currently follow the approved Shipping Management Plan (Version 3, Dec 2018) developed and approved as part of the Whale Tail Expansion Project.

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:*

- ***Wildlife will be given right of way;***
- ***Ships will maintain a straight course, constant speed, and will avoid erratic behaviour; and***
- ***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.***

This year, Agnico decided to produced a joint MMSO report with Agnico Eagle Meliadine Mine. As the shipping company Groupe Desgagnés ships equipment, supplies, and fuel to Meadowbank and Meliadine and sometimes vessel deserve both sites during the same trip, it was determined that it will be efficient to report all the observations into the same report while ensuring that the requirement from both sites are clearly identified. The below is a summary of the findings and Agnico will refer to the 2020 Marine Mammal and Seabird Annual Report is presented in Appendix 57 for a complete review.

During the 2020 shipping season, a total of 25 vessels, two of which were tugs (15 cargo and 10 fuel) travelled to Meadowbank (four vessels), Meliadine (six vessels), or to both Meadowbank and Meliadine (15 vessels) between July 1 and October 20. Most of these vessels delivered cargo and fuel exclusively for Agnico Eagle, while eight trips also conducted community re-supply before visiting Agnico Eagle projects.

All vessels servicing the Meadowbank and Meliadine projects travelled south of Coats Island with the exception of two occasions in September 2020, when the captain decided to use the north passage because of safety issues associated with inclement weather, with tides up to 3 m and strong winds. On July 22, the track data indicate that the Sedna Desgagnés also travelled between Southampton and Coats Islands; however, this vessel serviced the community of Coal Harbour, explaining its presence between Southampton and Coats Islands. Figures 3.1-1 to 3.1-4 provided in the 2020 Marine Mammal and Seabird Annual Report (Appendix 57) show the shipping tracks from July to October and support this conclusion. Based on this result, Agnico can confirm that they used the routing south of Coats Island as the primary shipping route, subject to vessel and human safety considerations.

In compliance with Term and Condition 39, project vessels must follow a setback distance of 500 m from colonies and aggregations of seabirds and marine mammals while transiting through the Hudson Strait, Hudson Bay, and Chesterfield Inlet. Vessel tracks were mapped along with identified sensitive areas for wildlife; where detailed data was available, vessels were shown to avoid these areas where safe to do so. Groupe Desgagnés had several occasions where tracks appeared to intersect with 500 m setback polygons. However, in all cases no ship track point was located within a setback polygon. Track data is based on satellite AIS (Automatic Identification System); therefore, ship track intersections likely occurred due to lack of ship track resolution and the intersection of existing points to create a continuous shipping track. Additional effort will be made in 2021 to ensure Groupe Desgagnés provides accurate track data to Agnico Eagle. In 2020, vessel tracks, where sufficient data are available, show vessels avoiding sensitive areas for marine wildlife.

Mitigation measures detailed under Project Certificate No. 004 Condition 41 were followed in 2020. No marine mammal-vessel interactions or birds-vessel interactions (e.g., strikes) were recorded in 2020. Refer to the complete report in Appendix 57 for a complete discussion of the observations/results.

During 2020, Agnico provided updated training materials for vessel crew that were delivered by Agnico Eagle to all Groupe Desgagnés captains and bridge crew on vessels supplying Meadowbank and Meliadine. These training materials included updated instructions for vessel crew on: 1) setbacks from sensitive marine wildlife habitats such as marine mammal haul-outs and seabird colonies, and 2) mitigation procedures should marine mammals or seabirds be observed in or near the vessel path.

Updated training materials were also supplied to dedicated MMSO crew observers including detailed methods for marine mammal and seabird surveys (on moving vessels and stationary vessels), data sheets, and training videos.

The 2020 MMSO program resulted in greater survey effort compared to previous years. Datasheets were obtained from 19 of the 25 vessels in 2020, which was greater than in 2019 when only six vessels provided datasheets, and in 2018 which had only two participating vessels. Training material distributed before the 2020 shipping season is presented in appendices A, B and C and discussed in Section 1.3 of the report presented in Appendix 57.

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 3, December 2018).

A complete report, 2020 Marine Mammal and Seabird Annual Report, detailing the 2020 mammal and seabird observations during the shipping season can be found in Appendix 57. Below is a summary of the report and Agnico will refer the reader to the report in Appendix for a complete review.

In 2020, 58 transects were surveyed for marine mammals, compared to less than 40 in previous years. There were 12 sightings (during surveys or incidentally) of marine mammals during the 2020 shipping season, compared to seven (all during surveys) in 2019, none in 2018, and six (all incidental) in 2017. The majority of all marine mammal sightings between 2017 and 2020 were recorded in the Eastern Hudson Strait or near Marble Island. There are an insufficient number of marine mammal sightings recorded to conduct a density analysis. No marine mammal-vessel interactions (e.g., strikes) were recorded by Groupe Desgagnés in 2020 or in previous years (2017, 2018, or 2019).

No interactions between vessels and seabirds were recorded during the MMSO in 2020, or in previous years. Seabird survey effort on moving vessels has remained relatively consistent across all years (2018 to 2020). Over three years of moving vessel surveys for seabirds between 2018 and 2020, 48 species and 3,446 individual birds have been recorded across all years. The most common species recorded in 2020 was northern fulmar, followed by thick-billed murre. The same species were the most commonly recorded across all years, with the exception that snow goose was the most common overall, due to large numbers observed in 2019. Predicted seabird densities varied more, with the highest density predicted in 2019 (1.879 birds/ km^2) and the lowest predicted in 2020 (0.701 birds/ km^2). The variation in density estimates reflect the variability in overall detection rate between years, i.e., there were almost twice as many birds detected in 2019 than in 2020 despite greater spatial effort in 2020.

The majority of stationary seabird surveys were conducted in 2020, with five times the number of surveys conducted in 2020 compared to the previous two years combined. A total of 560 individual birds from 24 species were recorded during stationary vessel surveys in 2019 and 2020. Nearly 96% of records were from 2020 (n = 536 individuals). Detection estimates were much lower for stationary vessel surveys compared to moving vessel surveys (0.168 ± 0.022 for all years). This is consistent with the data, which indicate that both detections and number of birds recorded per survey were much lower for stationary surveys compared to moving surveys.

In compliance with Project Certificate No. 004 Condition 36, local area marine mammal monitors have conducted surveys aboard vessels transiting between Chesterfield Inlet and Baker Lake between 2008 and 2019. In 2020, community members were not permitted to board vessels due to health and safety restrictions in place related to the COVID-19 pandemic. Therefore, Groupe Desgagnés had their MMSOs record sightings of marine mammals and seabirds when possible while travelling on the barge; however, given the navigational complexity of the area (i.e., difficult passage with tight turns through narrow passage) and rest requirements for crew, a limited number of surveys (total of eight surveys) were conducted in this area in 2020. In 2020, four marine mammal survey transects were conducted. During the surveys, one harbor seal was recorded in August. In addition, four seabird survey transects were conducted by the dedicated MMSO while on board the barge. Seventeen birds were observed, including seven herring gulls, three northern fulmars, two great cormorants, two black scoters, one pomarine jaeger, one glaucous gull, and one unknown gull.

For 2021, if health and safety restrictions in place related to the COVID-19 pandemic are lifted, it is Agnico's intent to hired local monitors in compliance with Term and Condition 36. Recruitment will be done with the community agents to find reliable and available monitors that are willing to board the vessels for a significant time period, as the vessels are travelling back and forth from the Inlet to the Baker community. Recruitment from the community has always proved to be challenging as multiple candidates first accepted the proposed work but declined and/or changed their minds at the last minute or decide to unboard the vessel on short notice and did not want to pursue this type of work any further.

In previous year, prior to the beginning of the barge season, Agnico Eagle toured the related communities, including Chesterfield Inlet, to advertise the need of having monitors available for the upcoming shipping season. This will be repeated in 2021 if allowed in the current situation.

As an alternative to ensure data collection as per Condition 36 in 2012, Agnico will continue to work with Desgagnés Group the possibility to pursue, in the following years, the marine mammal monitoring from Helicopter Island to Baker Lake infrastructures.

As discussed in previous section. Agnico Eagle improved the effectiveness of the MMSO Program in compliance with Whale Tail Pit Project Certificate No. 008 Term and Conditions 38, 39, 40 and Meadowbank Project Certificate No. 004, Term and Condition 36. The training material summarize and simplify both the Marine Mammal Management and Monitoring Plan (MMMMP) and Shipping Management Plan (SMP) which as resulted in greater survey effort compared to previous years.

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.***

A teleconference was held on May 14th, 2020 with Baker Lake Hamlet and HTO to present about the 2020 Sealift Season. Due to COVID-19 exceptional circumstances, Agrico Eagle was not able to hold the usual community information meetings in person. During the teleconference, options for the 2020 sealift season were presented, which were carefully analyzed to ensure minimal impact on the surrounding community. Additionally, update on how Agnico will notify the community was presented.

On July 9th, 2020, a memo was shared with the Hamlet of Chesterfield Inlet informing about the upcoming sealift season. In order to provide communities with ongoing shipping information, Agnico Eagle did multiple Facebook posts on Agnico Meadowbank Complex and Agnico Meliadine Facebook pages, as well as provided updated information on http://aemnunavut.ca/sealift_season/, where community members could also track the live vessel position, view answers to frequently asked questions, and view a brochure with specific information on the shipping season.

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.***

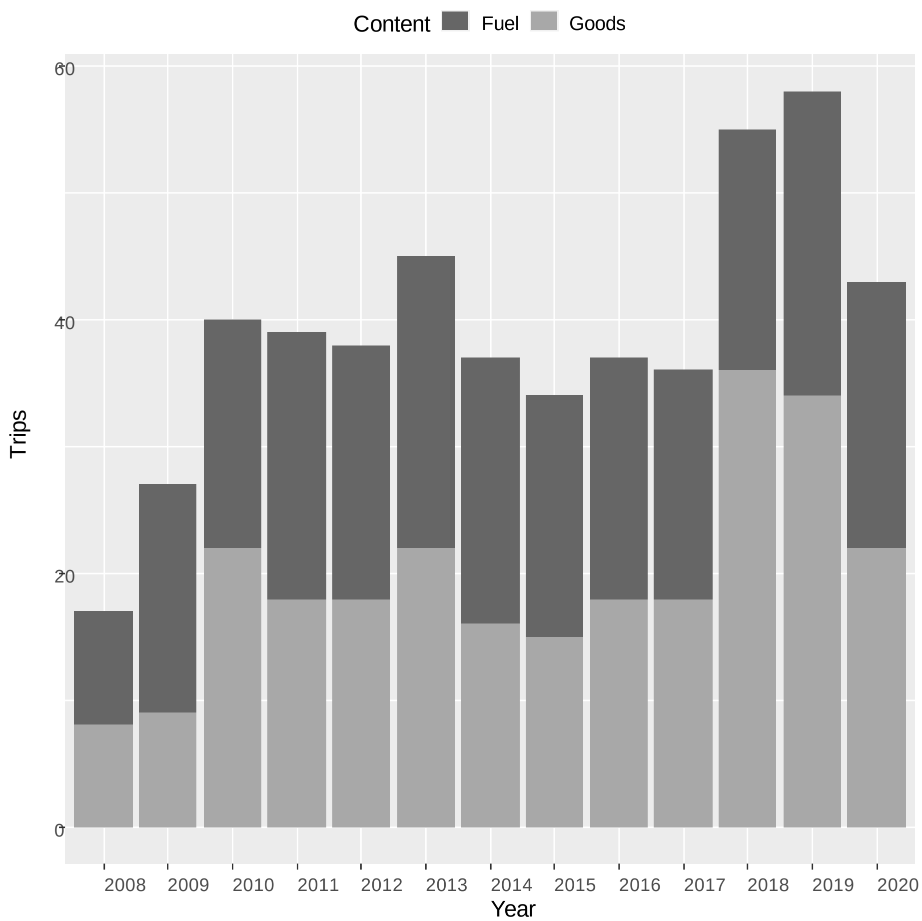
And

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 2020, Agnico monitored the ingress/egress of ship cargo at Baker Lake and the results are summarized in the below Figure 39. Barge trips from Chesterfield Inlet in 2020 numbered 22 for general cargo and 21 for fuel. With the expansion at the Whale Tail site traffic increased in 2018 and 2019 compared to previous years (e.g., from < 40 in 2016 and 2017 to ~ 55 in 2018). In 2020, the number of trips decreased slightly compared to 2018 and 2019 for both general cargo and fuel.

Only certified vessels were hired to carry the cargo at Meadowbank. Annual meeting were held with the dry cargo and fuel carriers to review the shipping and emergency plan.

Figure 39 Barge traffic (number of trips/year) arriving in Baker Lake from Chesterfield Inlet since 2008



In 2020, 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 and WTHR.

No claim was reported by our marine or trucking shippers in 2020.

11.9 CONSULTATION, ENGAGEMENT AND COMMUNICATION

As required by NWB Water License 2AM-MEA1530 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 60 for more information regarding the public consultation and participation with local organization and the residents of the nearby communities. Appendix 60 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.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.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.***

In 2020, due to COVID-19 pandemic and community restrictions there were no stakeholder and public meetings held in Chesterfield Inlet. However, Agnico Eagle representatives remained connected via email or teleconference with the Chesterfield Hamlet representatives. Additionally, in 2020, the Community Liaison Officer in Chesterfield remained active during the COVID-19 pandemic.

On November 19th of 2020, an Agnico Eagle Senior Management tour was planned however, it was cancelled due to COVID-19 lockdown in the Kivalliq. The objectives of this tour was to give updates on

Agnico operation, discuss upcoming initiatives and any potential concerns with the Mayor and the Hamlet Council, and meet with local employees.

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 2020, two (2) meetings and eight (8) teleconferences were held with the Baker Lake HTO. Agnico Eagle continued to have regular engagements on project activities throughout 2020, including regular communication between the Project Environment team and HTO. Baker Lake HTO is also represented on the Baker Lake Community Liaison Committee.

Meeting and teleconferences topics included:

- Proposed new fish habitat project
- Whale Tail Caribou Management Plan
- Caribou migration
- ICMC and Cyanide transportation
- 2020 Sealift Season

- COVID-19 protocols—Aginco Eagle's no interaction rules with community
- COVID-19 Task Force Food Security Committee at Baker Lake
- Other topics: Nunavummiut return to work plans and PPE supplies and distribution

11.9.3 Community Liaison Committees

In 2020, 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 encourage dialogue 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 2020, one (1) Community Liaison Committee (CLC) meeting was held to present preventive measures put in place at Meadowbank Complex in response to COVID-19 pandemic as well as, to provide update on the community support.

A report summarizing consultation with the Community Liaison Committee in 2020 is attached in Appendix 61.

11.9.4 Elders

A Wildlife and IQ coordinator is part of the Agnico Community Relations team who vets any wildlife issues and incorporates Inuit Qaujimayatuqangit during community consultation and engagement. In 2020, the Wildlife and IQ coordinator assisted in gathering elder knowledge on matters relating to caribou protection measures and our operations on the AWAR. The coordinator also is also tasked to engage with the HTO during caribou migration and convey. During the challenging COVID-19 2020 year, the Wildlife and IQ coordinator participated in developing Agnico Eagle's COVID-19 community isolation protocols and best practices if a hunter gets lost during COVID-19.

In 2020, Agnico Eagle started working on creating an Inuit Advisory Committee to discuss Traditional Knowledge on its ongoing and upcoming projects with Elders and Community. This Committee aims to collect information, ensure respect to cultural aspects and better integration of Traditional Knowledge into Agnico Eagle operations.

11.9.5 Baker Lake

11.9.5.1 *Community Meetings in Baker Lake*

In 2020, one (1) public community consultation took place in Baker Lake for the Meliadine Waterline project. The objective of this meeting was to answer questions and give opportunity for feedback. Other planned in-person community meetings did not occur due to COVID-19 pandemic and community restrictions. However, Agnico Eagle representatives remained connected via email or teleconference with the Baker Lake Hamlet representatives. Additionally, in 2020, the Community Liaison Officer in Baker Lake remained active during the COVID-19 pandemic.

On November 27th of 2020, an Agnico Eagle Senior Management tour was planned in Baker Lake however, it was cancelled due to COVID-19 lockdown in the Kivalliq. A meeting between Agnico Eagle Management and Baker Lake Mayor was planned. The objective was to discuss plans to seek the return to work of Nunavummiut employees, convoys during caribou migration seasons and hear more from Baker Lake Council regarding community priorities and aspirations, so that Agnico Eagle can continue improving its collaboration with local communities.

More details regarding Baker Lake community engagement can be found in in the Appendix 60.

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 Complex site. In 2020, due to COVID-19 pandemic and community restrictions Agnico Eagle did not host any Meadowbank Complex site tour for Baker Lake residents.

11.9.6 Community Engagement Initiatives

Community engagement and consultation initiatives that Agnico Eagle held or participated in during 2020 are summarized in the Appendix 60.

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 Human Resource (HR) department and the recruitment team,
- Assist HR and other Agnico Eagle departments to locate employees or potential employees as required

- Provide advice and assistance to Agnico Eagle to organize and hold information sessions in the community on Agnico Eagle projects, initiatives, and engagement activities, including Labour Pool and business opportunities initiatives outlined in the IIBA
- Provide updates to the Hamlet Council and to other community stakeholders on Agnico Eagle activities
- Distribute Agnico Eagle information and promotional materials
- Participate in Agnico Eagle's Nunavut donation initiatives and processes
- Participate in organization community events and education initiatives

This increased community involvement by the Community Coordinator will allow Agnico Eagle to achieve recruitment goals and the obligations for the NIRB and IIBA; therefore, rendering this position essential to Agnico Eagle's Nunavut operations

11.9.7 Communication

As required by NIRB Project Certificate No.008 Item 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.***

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.

In 2020, Agnico Eagle continued to use the Meadowbank Complex Facebook page as a key medium of communication with employees and Kivalliq communities. During the COVID-19 pandemic, the page was used to keep community and employees informed on COVID-19 prevention and management on site, as well as Agnico COVID-19 community response and community offices' schedule

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 2020, 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 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. In 2020, Agnico Eagle had undertaken a comprehensive review and update of the Kivalliq Project SEMP following the release of the amended Whale Tail expansion Project Certificate No. 008 on February 19th, 2020 by the NIRB. The SEMP has been updated with T&C # 46–Gender-Specific Initiatives. The updated SEMP has addition of VSEC 11 'Gender', and indicators 11.1 and 11.3, which have been approved by the SEMWG.

  The updated SEMP can be found in Appendix 62.

- The Socio-Economic Monitoring Working Group (SEMWG), traditionally included GN and CIRNAC, however, in 2020 KIA has officially joined the SEMWG. The aim of this working group is to support Agnico Eagle's SEMP and the KvSEMC. In 2020, Agnico Eagle organized teleconferences with the SEMWG to discuss the 2019 Socio-Economic Monitoring Report, to prepare for the 2019-2020 Kivalliq SEMC, and to receive an update on the GN Territorial Monitoring 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 2020, due to COVID-19 pandemic and Kivalliq travel restrictions the 2019-2020 Kivalliq Socio-Economic Monitoring Committee meeting was not scheduled. Several email communications and teleconferences took place between Agnico Eagle and the SEMWG to discuss alternative solutions to host the 2019-2020 KvSEMC meeting. However, due to logistical and technological challenges the modified alternative solutions could not be accomplished. The Government of Nunavut and CIRNAC recognized that Agnico Eagle did their utmost to fulfill this Project Certificate requirement.

- 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 data that is 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.

- At a SEMWG meeting on February 6th, 2020, Agnico Eagle proposed to move the deadline of the SEMR to meet the NIRB Annual Report submission deadline. This was based on past discussions with the SEMWG. This effectively moves the deadline from June 30 to March 31. The main impact of the change in reporting deadline is that some community-level data would not be available, and therefore some community-level data would be reported with a year-delay annually, however the benefit would be to better align reporting and review processes for Agnico Eagle and reviewers. The change was approved by the SEMWG. Therefore, Agnico Eagle is appending the 2020 Agnico Eagle Kivalliq Projects Socio-Economic Monitoring Report (Appendix 52).

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;***
- ***Include a process for adaptive management and mitigation to respond if unanticipated impacts are identified; and***
- ***Monitor the success of existing and newly implemented gender-specific initiatives to determine their success and why they were considered successful or to identify any challenges to their implementation.***

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.***

Refer to Section 11.10.1 above.

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 section below represents summarizes key Agnico Eagle's socio-economic reporting, related primarily to employment and training. For the full report on the Project's socio-economic monitoring, please refer to the Appendix 52.

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 31st, 2020 was 1,070, of which 320 employees were Inuit employees. The respective full-time equivalencies were 965 Agnico Eagle employees in total, with 242 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 2020 there were 734 full time equivalent (FTE) contractor positions, of which approximately 19 are filled by Inuit — this represents a decrease of 17 full-time contractor positions in comparison to 2019. This decrease can be attributed to the COVID-19 pandemic and Nunavummiut being sent home to prevent community transmission.

Taken together, there were 1,804 active employees (Agnico Eagle permanent, temporary, on-call, students and contractors), working full- and part-time jobs, at the end of 2020.

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:

Table 11-6 Home communities of Agnico Eagle Inuit employees (by headcount)

Community of Hire	2019 Agnico Eagle headcount	2020 Agnico Eagle headcount
Arviat	84	74
Baker Lake	190	168
Naujaat	15	16
Rankin Inlet	21	15
Chesterfield Inlet	6	6
Whale Cove	7	7
Coral Harbour	11	12
Kitikmeot	-	0
Qikiqtani	-	0
Outside of Kivalliq	21	22
Total	**355**	**320**

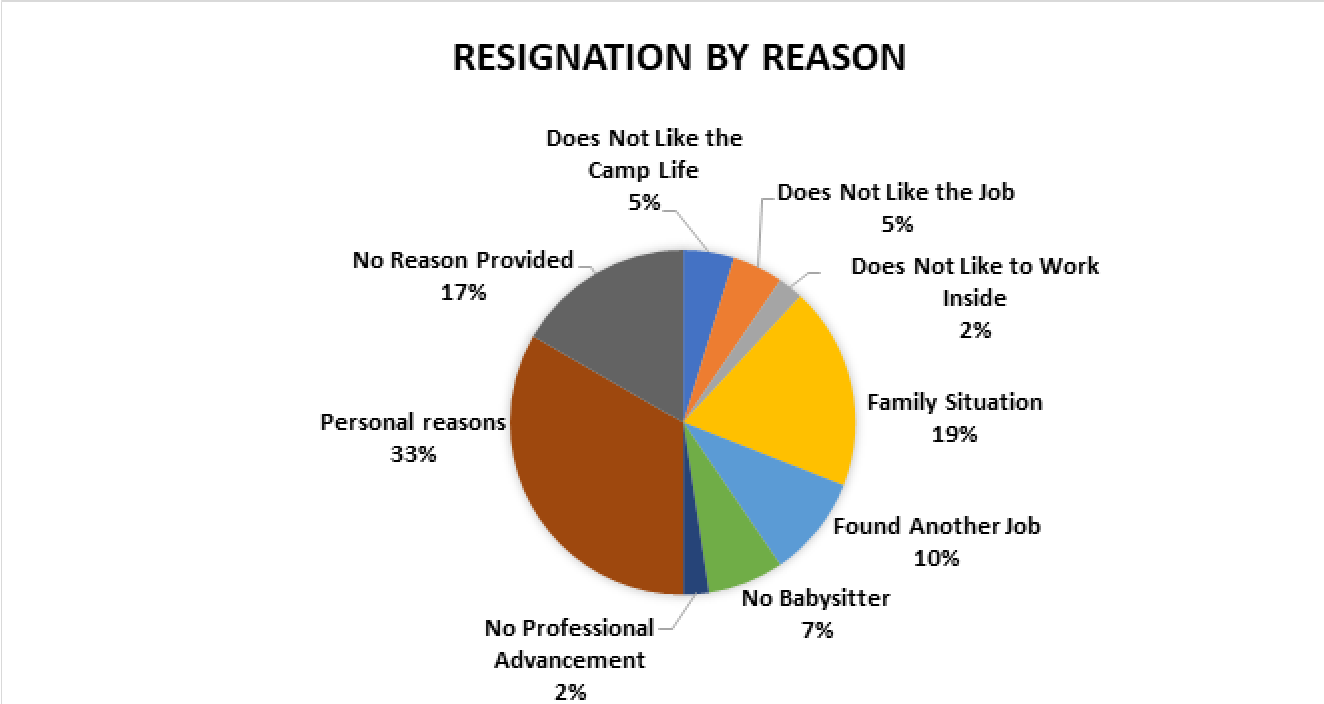
Agnico Eagle pays for the transportation of all Kivalliq-based employees from their home community to the mine for each work rotation. For employees coming from Arviat, Chesterfield Inlet, Rankin Inlet and/or Whale Cove, Agnico Eagle has a service contract with Calm Air to transport employees by charter 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 table provides the reasons given for voluntary terminations.

Table 11-7 Reasons given for voluntary terminations



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. 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. In addition, 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. 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.

In 2021, the pre-employment program will be reviewed to address long delays in accessing trainings, dense theoretical contents, and logistical issues resulting in providing training either at Meadowbank Complex or Meliadine. The revised two (2) weeks program will consist of series of suite that will better prepare future Inuit employees, including more practical workshops and training, incorporation of new technologies such as virtual reality and implementation of the buddy system to guide new employees when they start working at the mine site.

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 2019 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 February 2020, advertisement for Summer Employment program was done. However, considering COVID-19 pandemic and the health and safety of the students both summer programs were cancelled. In 2021, after re-evaluating the COVID-19 pandemic situation, Agnico Eagle plans to offer both programs 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. The list of training provided can be found in Appendix 63.

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 KivIA 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.

In 2020, due to COVID-19 pandemic and travel restrictions to prevent community transmission no employment information sessions were held in Kivalliq communities.

Figure 40 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 2019, the Work Readiness Training was delivered in collaboration with Aglu Consulting. 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 2020, due to COVID-19 pandemic and travel restrictions to prevent community transmission no Work Readiness sessions were delivered in Kivalliq communities.

11.10.3.2.1.2 Mandatory Training (Site Readiness)

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 seven-day training provided at the Meadowbank and Meliadine 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 2020 of Q1, one (1) Site Readiness training session was delivered at Meadowbank Complex with 29 participants. Even though the training was delivered at Meadowbank Complex the participants were not limited to acquiring a position at Meadowbank.

11.10.3.2.2Training 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 Agnico 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

- Emergency Response Training (ERT)

The following table provides the training hours provided to Agnico Eagle employees at Meadowbank and Whale Tail (excluding contractors) in 2020.

Table 11-8 2020 Training hours

Type of Training	Inuit	Non-Inuit	Total
Mandatory	326	6886	7,212
General	112	1915	2,027
Specific	5558	9775	15,333
Education	12	0	12
ERT	12	22356	22,368
Total	**6,020**	**40,932**	**46,952**

11.10.3.2.3Training 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, as well as information on the IIBAs and archaeological awareness. The e-learning training material has been translated into English, French, and Inuktitut.

In 2020, an external firm started the development of all 6 e-learning modules. At the end of the year, the General Induction module was in post-production and pre-launch testing phase on the Agnico Eagle Learning Management System. The WHMIS and the Fire Suppression System modules were in production phase by the external firm. The three (3) other modules were in pre-production phase by the external firm. All modules are expected to be launched in 2021.

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 2020, Meadowbank and Whale Tail held one (1) cross-cultural session.

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 2020, two (2) Career Paths were in development: The Warehouse Career Path at Meadowbank and the Camp Career Path at Meliadine. Also, in 2020, the Mine and the Drill & Blast Career Paths were updated at Meadowbank to create more opportunities and allow the employees to be more comfortable in their position.

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 2020, 7 trainees (4 men and 3 women) were enrolled in the Haul Truck Trainee Program. Among those, a total of 4 trainees successfully completed the program in March. A total of 3 trainees could not complete their training due to COVID-19 community restrictions. Training will resume once community restrictions are lifted and they can return to site. They are considered as unsuccessful until they can get back to site and complete the remaining training requirements.

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 2020, a cohort was supposed to start in March with two (2) trainees but the program was cancelled due to COVID-19. Furthermore, in 2020, the training department and process plant were planning to review the Super Operator Program. However, due to COVID-19 and Inuit trainees being sent home the discussion was paused.

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.

In 2020, 1 trainee was enrolled in the Long Haul Truck Trainee Program and he successfully completed the program. Subsequently, due to COVID-19 pandemic the program was suspended.

11.10.3.2.3.7 Apprenticeship Program

Journeypersons will have the opportunity to challenge their Red Seal Exam. Currently, Agnico offer (9) trades: baker, cook, carpenter, millwright, electrician, heavy duty equipment technician, welder, housing maintainer and plumber.

In 2019, the program was reviewed in order to substantially increase our support to apprentices while they are at school for their technical instruction. Logistical, material, educational and financial support is provided to our Apprentices.

In 2020, two (2) employees completed their apprenticeship training with Agnico. One (1) apprentice went to technical training in Alberta. The other apprentice was supposed to go to technical training throughout 2020, but the planned training was stopped due to COVID-19 restrictions. At the end of 2020, there were eight (8) apprentices and pre-apprentices at Meadowbank and two (2) apprentices and pre-apprentices at Meliadine. One (1) apprentice continued his training on-the-job at Meliadine during the year. All other apprentices stayed home due to COVID-19.

Since 2015 a total of eight (8) 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 works with pre-apprentices to help them gain the academic skills and confidence to successfully pass their trade's entrance exam, as well as apprentices to support them in their level exams. 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. The goal of TASK week (Trades Awareness, Skills and Knowledge) is to motivate the students to think about their future after graduation.

In 2020, a full-time Adult Educator was present at Meadowbank who supported number of Inuit employees. However, in mid-March the support came into pause due to the COVID-19 pandemic and all Nunavummiut being sent home as a precautionary measure.

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. Meadowbank and Whale Tail Emergency Response Team (ERT) consists of internal employees that volunteers to respond to emergencies such as fire. The ERT practice takes place weekly and each member must attend at least six (6) practices throughout the year. Currently, there are 113 active Emergency Response and Mine Rescue members and out of which ten (10) are Inuit members. Due to COVID-19 pandemic response and isolation restrictions nine (9) Inuit out of ten (10) are not active. In 2020, 5 basic mine rescue courses were given in order to on-board new ERT members for both Meadowbank and Whale Tail site. In total 55 training sessions were given that included weekly practices, mock scenarios and specialized trainings.

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 2nd, 2018 and Operations Phase staff schedules have been sent to NIRB on April 25th, 2019 with an updated Version on June 25th, 2019 (Appendix 54 of the 2019 Annual Report).

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.

In February of 2020, Agnico Eagle met with the Government of Nunavut's Career Development Officer and three (3) Family Services representatives at the Meadowbank site. Items discussed were job ads and online applications, targeted employment information sessions in communities for graduating students, and opportunities for graduating students to come on site for special Site Readiness programs. Additional discussion points were summer employment, OETIO and trades training, contractor information, NAC for potential internship candidates and underground career paths.

Government of Nunavut and Family Services representatives provided many suggestions on improvements and areas for collaboration. A follow up meeting was planned in October, however it was cancelled due to COVID-19 pandemic.

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 14th, 2018. There have not been any updates since the last submission. The list can be found in Appendix 59 of the 2018 Annual Report.

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.***

Agnico Eagle is appending the IIBA-required 2020 Labour Market analysis (LMA) report with the 2020 NIRB Annual Report. The 2018 IWBS was submitted to NIRB on March 6th, 2019. The results from the 2020 LMA and 2018 IWBS is incorporated into the 2020 SEMR. In 2021, AEM-KIA Employment Culture Committee will participate in the 2021 Inuit Workforce Barrier Study and integrate the results in the 2021 Annual Reports, considering the report will be accessible before NIRB Annual Report submission date.

The LMA and IWBS Reports can be respectively found in Appendix 64 of the 2020 Annual Report and 61 of the 2019 Annual Report.

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.***

In 2020, a Memorandum of Understanding (MOU) was planned to be presented, which establishes the foundations of a greater collaboration and communication between the Agnico Nunavut clinics and the Kivalliq Health Centers. However, due to COVID-19, this initiative was put on hold. This MOU includes the involvement of the Agnico Nunavut clinics in the diagnostic and initiation of treatment of Sexually Transmitted Diseases (STD) as well as the participation of the Agnico Nunavut clinics in STD prevention programs. Some other health prevention subjects were covered by this MOU, like flu and tuberculosis.

When required, Agnico Nunavut clinic nurses organize all the logistics around transportation and treatment of Nunavummiut down south. The appointments with the doctors are organized by the Agnico nurses. Agnico Eagle takes care of all the required booking and funds the whole transportation, which includes lodging, meals and medical fees.

When a worker is treated on-site for a personal or a work-related condition and requires medical attention off-site, the worker is always provided with a ‘’Return to Work’’ form. The form explains the worker’s condition and the treatment provided thus far to the receiving healthcare professional. This form is also used to transmit information back to the Agnico Nunavut clinics. The Return to Work form is an effective form of communication as it prevents loss of information between healthcare professionals and the care of the worker is documented versus having only verbal communication.

Any emergencies being transferred to Baker Lake, the healthcare center is always contacted prior to initiating the transport to make sure they can receive the patient safely. Also, if a community healthcare center requires Agnico Nunavut clinics to continue some special treatment initiated in the community, they can call and email the respected clinics. Subsequently, necessary arrangements can be made between the clinics to ensure continuity of care.

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.***

In 2020, Agnico Eagle actively engaged with GN to investigate home ownership options. Agnico Eagle held teleconferences with GN Housing on April 17th, July 8th, and August 26th of 2020 to discuss architecture, supply chain and ownership challenges. Following these discussions, Agnico Eagle engaged in surveying Kivalliq home builders to discover the preferred price point for home ownership based on mortgage pre-approvals and investigated supply and capacity gaps to build homes in the summer. Also, Agnico Eagle met with Natural Resources Canada to explore any HVAC innovations that were forthcoming to accommodate housing with high rate of dwellers. Lastly, Agnico Eagle met with University of Ottawa (Engineering) to update Net Zero Home for the Arctic.

11.12 STATUS OF COMMITMENTS

As required by NIRB Project Certificate No.008, Condition 68: ***The Proponent shall maintain an up-to-date listing of the status of implementation for its commitments made during the Nunavut Impact Review Board’s (NIRB) assessment of the Whale Tail Pit Project Proposal and the Whale Tail Pit Expansion Project Proposal through engagement of parties and active monitoring of associated implementation.***

The Proponent shall provide a status report on the implementation of all its commitments within three (3) months of issuance of the Project Certificate for the Whale Tail Pit Expansion Proposal and annually thereafter within its annual report to the NIRB

An up to date listing of the status of implementation for commitments made during the NIRB assessment is provided in Appendix 66 .

SECTION 12. POST-ENVIRONMENTAL ASSESSMENT MONITORING PROGRAM (PEAMP) – EVALUATION OF IMPACT PREDICTIONS

12.1 PURPOSE

According to Appendix D of Meadowbank's NIRB Project Certificate No. 004, the Post-Environmental Assessment Monitoring Program (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 goal of the PEAMP is to provide the NIRB and other regulatory agencies information on how actual environmental and socioeconomic effects of the Meadowbank mine site compare to impacts predicted in the Final Environmental Impact Statement (FEIS; Cumberland, 2005).

The objectives of the PEAMP as specified in Appendix D of the Project Certificate 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.

Based on comments from the NIRB on Agnico's 2017 and 2018 PEAMP reports, and discussions by phone with NIRB representatives in November 2019, Agnico has revised the PEAMP to also more specifically address the following NIRB recommendations to:

1) Include a discussion that references the baseline and previous years' monitoring data and identifies any trends for each valued ecosystem component where an effect has been observed. Include this information in table and graphic format in order to clearly demonstrate what is being observed.

2) Identify instances where original and/or amended impact predictions can no longer be supported based on project experience to date and include an analysis of the effectiveness of management and mitigation strategies currently employed.

3) Agnico recognizes the following recommendation, but asserts at this time that it is not a requirement of the PEAMP according to the Project Certificate.

4) Include a summary of lessons learned from the Project to date which can be applied to both updating existing project plans and to any of Agnico Eagle's other planned or ongoing projects as applicable.

Beginning in 2019, Agnico extended the PEAMP to include the Whale Tail Pit Project, which is replaced by the Whale Tail Pit Expansion Project in 2020. Measured impacts are compared to those described in the FEIS for the Whale Tail Pit Project (Agnico Eagle, 2016) and the FEIS Addendum for the Whale Tail Pit – Expansion Project (Agnico Eagle, 2018), as appropriate.

12.2 PEAMP EVALUATION

To fulfill Items A through D described in Appendix D of the Meadowbank Project Certificate No. 004, and in support of NIRB Recommendations 1 and 2 described above, a PEAMP evaluation has been carried out for each valued ecosystem or socioeconomic component (VC) identified in the FEIS documents for the Meadowbank Project and the Whale Tail Pit Project (Cumberland, 2005; Agnico Eagle, 2016; Agnico Eagle, 2018). A conceptual model of the PEAMP evaluation process is provided in Figure 41. This process involves five components, described below. After an initial review of the FEIS to identify and summarize impact predictions for the current project phase (Part 1), Parts 2 – 5 are repeated on an annual basis to form the evaluation.

Part 1: For each VC, predicted residual impacts are summarized for the current project phase. Residual impacts are those occurring after planned mitigation measures are implemented (a summary of the FEIS-planned mitigation measures for each VC is provided Part 5, along with a description of implementation in the current monitoring year). Only predicted residual impacts for which monitoring was recommended in the FEIS are summarized, since the PEAMP program focuses on evaluating monitoring results in relation to impact predictions.

Part 2: For each predicted impact, current-year results of the associated monitoring programs are reviewed and summarized. Future results will be added to these tables to ensure historical trends can be observed, even when predicted impacts are not exceeded in a given year.

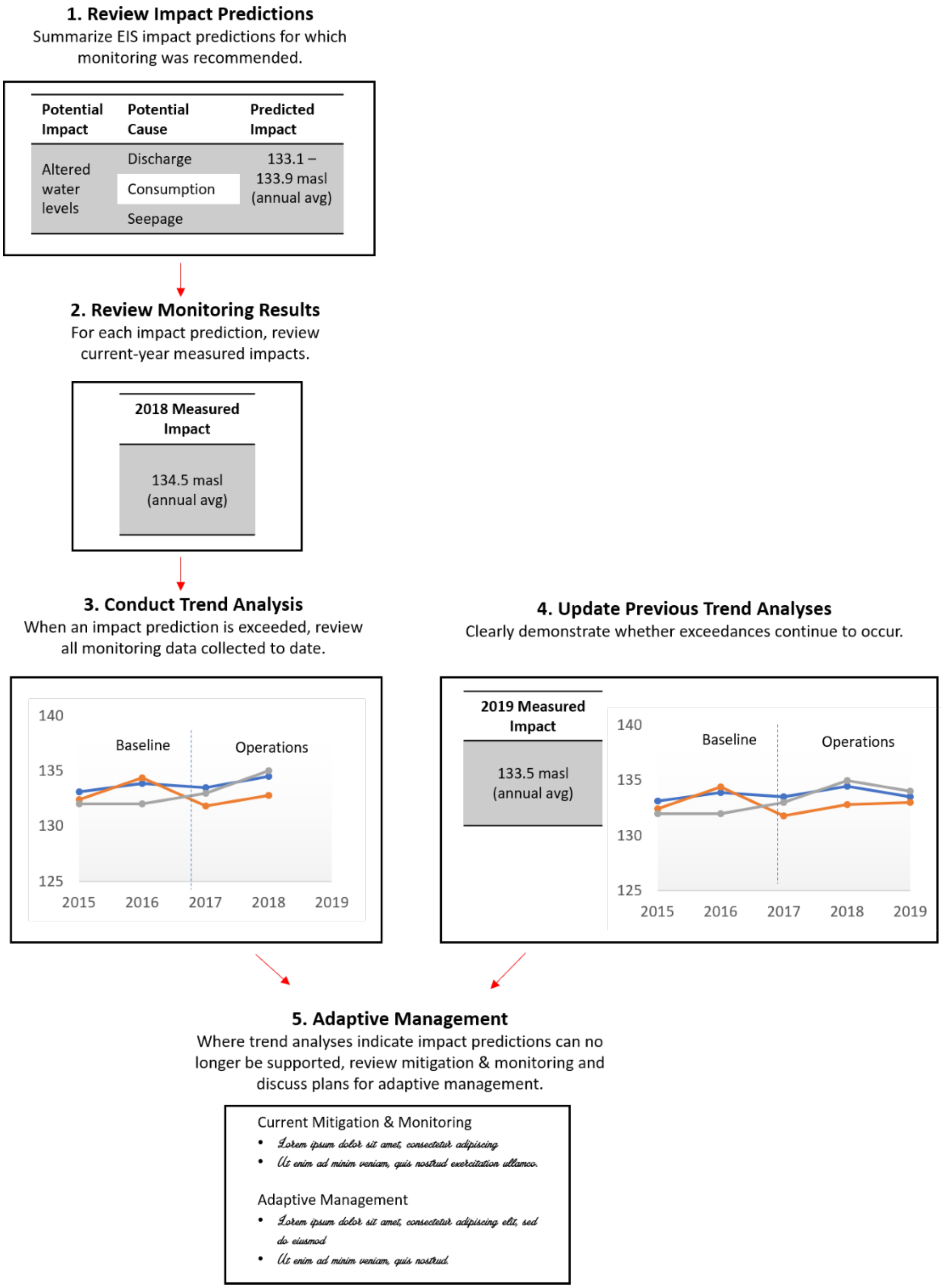
Part 3: When current monitoring results do not support an impact prediction (i.e. current-year measured impacts are outside of the range of predicted impacts), a trend analysis is conducted to review baseline and all monitoring data to date. A discussion of those results is provided.

Part 4: Previously reported trend analyses are updated, regardless of current year monitoring results. In this way, discussions and trend analyses will be presented in the PEAMP moving forward for all instances where impact predictions have historically been exceeded on one or more occasions.

Part 5: Effectiveness of the monitoring programs at assessing impact predictions is discussed. A summary of the FEIS-planned mitigation measures for each VC is provided, along with a description of implementation in the current monitoring year. Where monitoring results indicate that impact predictions can no longer be supported, a description will be provided of the proposed adaptive management approaches.

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. These differences are taken into account and identified when making comparisons to FEIS predictions

Figure 41 Conceptual model of the PEAMP evaluation process



12.3 SUMMARY OF IMPACTS

A summary of the predicted potential impacts for the Meadowbank site with references to the Project FEIS (Cumberland, 2005) are provided in Table 12-1.

A summary of the predicted potential impacts (primary effect pathways) for the Whale Tail site with references to the Project FEIS or FEIS Addendum (Agnico Eagle, 2016 or 2018) are provided in Table 12-2. Primary effect pathways are those pathways likely to result in a measurable change to measurement indicators that could contribute to residual effects on a VC relative to the Baseline Case or guideline values. Any change in quantitative impact predictions for Meadowbank site operations as a result of the Whale Tail Pit Expansion Project is described in the PEAMP evaluation sections below.

Table 12-1 Summary of FEIS VECs, potential impacts, and references for impact predictions for the Meadowbank project (as in Cumberland, 2005).

VEC	Summary of Potential Impacts	Reference (in Cumberland, 2005)
Surface water quantity	Reduced water level and flow in receiving lakes	FEIS, Section 4.21.2.3 FEIS App B, Table B4
Surface water quality	Contamination of receiving lakes	FEIS, Section 4.21.2.3 FEIS App B, Table B5 FEIS App E FEIS - WQ
Fish populations	Direct impacts through blasting. Indirect impacts through habitat changes.	FEIS, Section 4.21.2.7 FEIS App B, Table B13
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
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
Ungulates	Habitat loss, mortality	FEIS, Section 4.21.2.5 FEIS App B, Table B7
Predatory mammals	Habitat loss, mortality	FEIS, Section 4.21.2.5 FEIS App B, Table B8
Small mammals	Habitat loss, mortality	FEIS, Table 4.24 FEIS App B, Table B9
Raptors	Habitat loss, mortality	FEIS, Section 4.21.2.6 FEIS App B, Table B10
Waterfowl	Habitat loss, ingestion of contaminants, mortality	FEIS, Section 4.21.2.6 FEIS App B, Table B11
Other breeding birds	Habitat loss, mortality	FEIS, Section 4.21.2.6 FEIS App B, Table B12
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
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
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

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
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
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
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
Sites of heritage significance	Potential degradation of historically significant sites.	FEIS Section 4.21.4.7 FEIS App B, Table B15
Contributions to economy of Nunavut and Canada	$92M annually during operations phase.	FEIS Section 4.21.4.8

Table 12-2 Summary of FEIS Addendum VCs and primary effects pathways (potential impacts) assessed in the FEIS Addendum for the Whale Tail project (Agnico Eagle, 2018). In some cases (where indicated), pathways were carried over from the Whale Tail Pit FEIS (Agnico Eagle, 2016) and were not re-assessed in the FEIS Addendum.

VC	Primary Effect Pathways (Volume 3, Appendix 3-C)	Reference (in Agnico Eagle, 2018 unless indicated)
Surface Water Quantity	Project footprint, which will physically alter watershed areas and drainage patterns, may change downstream discharge, water levels, and channel/bank stability in streams, and affect water quality, fish habitat, and fish	Section 6.3.3.1
	Dewatering of lakes may change discharges, water levels, and channel/bank stability in receiving and downstream waterbodies, and affect water quality, fish and fish habitat	
	Alteration of watershed flow paths may change flows, water levels, and channel/bank stability in diverted and receiving waterbodies, and affect water quantity, water quality, fish and fish habitat	
Water Quality	Project footprint, which will physically alter watershed areas and drainage patterns, rates and quantities of diverted non-contact water to new watersheds, change downstream flows through flooding and dewatering, water levels, channel/bank stability in streams, and disturb lakes and may affect water quality and sediment quality	Section 6.2.3
	Water management activities (dams, drainage, diversion, discharge, and dewatering) that will alter natural drainage paths and create a reservoir may cause a change in mercury cycling	

	and bioaccumulation	
	Activities from construction activities and mining operations (e.g., equipment, vehicles, buildings, open-pit mining, blasting) can create fugitive dust emissions and subsequent dust deposition may cause a change in water quality	
	Activities from construction activities and mining operations (e.g., equipment, vehicles, buildings, open-pit mining, blasting) can alter air and dust emissions (including Sulphur dioxide, nitrogen oxides, and particulate matter) and subsequent deposition may cause a change in water quality	
	Release of treated mine effluent (including sources from sewage, WRSF pond, and attenuation pond contact) may cause changes to surface water quality and sediment quality (i.e., nutrient and metal concentrations) in Mammoth Lake in operations and closure.	
	Dewatering of waterbodies may change flows, water levels, channel/bank stability, and water quality (e.g., suspended sediments, nutrients, metals) in receiving and downstream waterbodies.	
Hydrogeology & Groundwater	(No primary pathways were identified)	NA
Fish and Fish Habitat	The construction of the Northeast, Whale Tail, and Mammoth dikes, Whale Tail, and IVR Pit and WRSF for the Expansion Project, dewatering of the diked area in Lake A17 (Whale Tail Lake) and Lake A16 (Mammoth Lake), (and dewatering and use of Lake A53 as the IVR Attenuation Pond for the Expansion Project, will result in the direct loss or alteration of fish habitat.	Section 6.5.4.2.2
	The construction of the North-East, Whale Tail, and Mammoth dikes will alter access to tributary streams and lakes (i.e., habitat connectivity) in the LSA, and may result in habitat loss for Lake Trout, Arctic Char, and Round Whitefish.	FEIS Volume 6, Section 6.5.3.2.2 (Agnico Eagle, 2016)
	During the construction and operations of the Whale Tail, Mammoth, and WRSF dikes, water diversions will result in a reduction of water levels in Lake A16 (Mammoth Lake) and downstream locations, affecting fish and fish habitat.	Fish and Fish Habitat Section 6.5.4.2.2. and Surface Water Hydrology Section 6.3.3.1.2.2
	Water diversions for the Whale Tail and Northeast dikes during construction and operations will flood tributary lakes and streams, and will result in the alteration of habitat	FEIS Volume 6, Section 6.5.3.2.2 (Agnico Eagle, 2016) Whale Tail Pit Fish Habitat Offsetting Plan, Table B-2
	The dewatering of the diked area in Lake A17 (Whale Tail Lake) and Lake A16 (Mammoth Lake), and smaller waterbodies in the northeast area for the Expansion Project, will result in the removal and subsequent mortality of fish from the area during the proposed fish-out	Section 6.5.4.2.2
	Release of treated mine effluent (including sources from sewage, WRSF pond, and attenuation pond contact) may cause changes to surface water quality and sediment quality (i.e., nutrient and metal concentrations) in receiving environment lakes in operations and closure.	FEIS Volume 6, Section 6.4.3.3 (water & sediment) and Section 6.5.3.3.2 (lower trophic levels & fish) (Agnico Eagle, 2016) and Section 6.5.4.3
Terrestrial Wildlife and Birds	**Ungulates and Upland Birds:** Sensory disturbance from vehicles, on-site equipment, human presence and vibrations, can change the amount of different quality habitats, and alter wildlife movement and behaviour	Section 5.5.3

	Ungulates and Upland Birds: Direct loss and fragmentation of wildlife habitat from the Project footprint	
	Ungulates: Barriers to migration, which may affect population connectivity and distribution	
	Upland and Waterbirds: Destruction of nests and flooding from construction activities including increased flows or water levels can increase risk of mortality to individual birds, which can affect population sizes	
Noise	Noise emissions from vehicles on the haul road can increase ambient noise levels.	Section 4.4.3
	Noise emissions from mining equipment can increase ambient noise levels. Blasting can result in ground vibration and increase ambient noise levels.	
Air Quality and Climate	**Air Quality**: Vehicle emissions and fugitive dust from traffic on the haul road can affect air quality	Section 4.4.3
	Air Quality: Blasting, stationary and mobile combustion sources, and fugitive dust from mining activities in the Whale Tail Pit can affect air quality.	Section 4.4.3
	Climate: Additional 3 years of processing and use of supporting infrastructure at the Meadowbank mine site and the existing AWAR for delivery of materials can produce greenhouse gas emissions that contribute to climate change	Whale Tail Site: FEIS Addendum Section 4.2.3.1 Meadowbank Mill: FEIS Section 4.2.3.1 (Agnico Eagle, 2016)
Vegetation, Terrain, Permafrost & Soils	**Vegetation:** Physical loss of plants and vegetation communities due to project footprint or alteration of drainage patterns.	Section 5.4.3
	Vegetation: Dewatering of lakes and diversion of water may change downstream flows and water levels, affecting permafrost, soils, vegetation, and wildlife habitat	
	Vegetation: Air emissions, dust deposition, or chemical contamination on terrain, soils, and vegetation can potentially change the quality and/or chemical properties of soil and affecting vegetation. Dust deposition may cover vegetation and lead to physical and/or physiological damage.	
	Soil: Physical loss or alteration of terrain and soil from the Project footprint , impacting vegetation and available wildlife habitat.	Section 5.3.3.1
	Soil: Soil disturbance, stockpiling and transport can change physical, biological, and chemical properties of soils. Site clearing, contouring, excavation and decommissioning can cause admixing, compaction, and soil erosion and change soil quality.	
	Terrain and Soil: Physical changes, including degradation to the permafrost, terrain and soils in the area of the mine site footprint and supporting infrastructure (i.e., haul roads)	
	Terrain and Permafrost: Open Pit mining result in physical loss or permanent alteration of terrain, soils, and permafrost within the mined out areas. Permafrost degradation and retreat due to excavation of open pits and potential groundwater inflows to the open pit during operations if depth extends below the base of permafrost.	
	Permafrost: Underground mining resulting in physical loss or permanent alteration of permafrost within the mined out areas. Permafrost degradation and retreat due to excavation of the mined out areas coupled with the inflow of groundwater to the underground operations, as the proposed underground operation will extend below the permafrost.	
Heritage Sites	(No primary pathways identified)	NA
Traditional Land	**Wildlife Harvesting**: Project activities may	FEIS Section 7.3.3.2

Use	affect continued opportunities for traditional wildlife harvesting	(Agnico Eagle, 2016)
	Fishing: Project activities Primary may affect continued opportunities for traditional fishing	Section 7.3.2.1.2
	Plant Gathering: Project activities may affect continued opportunities for traditional plant harvesting	FEIS Section 7.3.3.2 (Agnico Eagle, 2016)
	Culturally Important Sites: Project activities may affect continued opportunities for the use of culturally important sites	FEIS Section 7.3.3.2 (Agnico Eagle, 2016)
	Marine Resource Harvesting: Project activities may affect continued opportunities for traditional marine resource harvesting	Section 7.3.2.1.5
Socio-Economics	The Project will contribute to territorial economic activity via expenditures, procurement and Gross Domestic Product contributions	Appendix 7-B, Section 7-B-1.4.2
	The Project will contribute to government revenues through the payment of taxes and royalties	
	The Project will contribute to local business development through procurement and contacting	
	The Project will result in direct, indirect and induced employment opportunities	Appendix 7-B, Section 7-B-1.4.3
	The Project will result in direct, indirect and induced incomes	
	The Project will provide training opportunities for its workforce	
	The Project will contribute to community education	
	Project incomes may enhance individual and community wellness by providing access to education, nutritious food, and recreation, and by reducing poverty	Appendix 7-B, Section 7-B-1.4.4
	The Project may enhance individual and community wellness by continuing community contributions and the IIBA	
	The Project will continue existing individual and family wellness programming (e.g., EFAP)	
	The Project may improve health and safety awareness amongst employees, their families, and their communities	
	The Project may result in accidental injury or emergencies	
	Project incomes may adversely affect family and community cohesion through social ills (e.g., substance abuse, sexual misconduct, family violence, crime)	
	Project incomes may exacerbate income inequality, social disparity, and, potentially, related conflict in families and crime in communities	
	Project rotational employment may adversely affect family and community cohesion related to extended time away from family and community	
	Population growth and demographic change	Appendix 7-B, Section 7-B-1.4.5
	Change in demand for and availability of housing	
	Change in demand for and capacity of services and infrastructure	

12.4 MEADOWBANK PEAMP EVALUATION

For each VC, the completed PEAMP evaluation is presented in Sections 12.4.1 – 12.4.6, below, according to the six categories of assessment included in the FEIS (Aquatic Environment, Wildlife and Terrestrial Environment, Noise Quality, Air Quality, Permafrost, and Socio-Economics).

12.4.1 Aquatic Environment

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), Vault Dike construction (2013), dewatering of lakes and impoundments (2009-2011, 2013, 2016), effluent discharge (2012 to present), and dust-generating activities (e.g., roads, tailings storage, rock crushing, blasting, hauling; 2008 to present).

Within the FEIS, impacts to the aquatic environment potentially occurring through these activities are described for water quantity, water quality, and fish/fish habitat. Predicted and measured residual impacts for each of these VCs are described below.

12.4.1.1 *Water Quantity*

12.4.1.1.1 Parts 1 & 2: Summary of Predicted and Measured Residual Impacts

A summary of predictions for impacts to surface water quantity (Cumberland, 2005; Table B4.2) and the accuracy of these predictions in 2018 – 2020 (measured impacts) are provided in Table 12-3. Cells are highlighted in grey when measured impacts exceed predictions for the current year. A historical trend analysis and discussion are provided for those observations in Section 12.4.1.1.2. Future results will be added to that section to ensure historical trends can be observed, even when predicted impacts are not exceeded in a given year.

Table 12-3 Predicted and measured impacts to water quantity during the Operations period. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.4.1.1.2. **Impact prediction not well defined – trend analysis provided in Section 12.4.1.1.2.

Potential Impact	Potential Cause(s)	Proposed Monitoring	Actual Monitoring	Predicted Impact	Measured Impact		
					2018	2019	2020
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 (FEIS modeled range = 133.82 – 134.19 masl)	133.55 – 133.86 masl	133.46 – 133.74 masl	133.63 – 133.75 masl See Section 12.4.1.1.2
	Freshwater consumption (Third Portage Lake)	Monitor freshwater use	Freshwater use monitored	FEIS: 0.53 M m^3/yr (Year 5 – 8) NWB Water License 2AM-MEA1526 Part E, Item 1: 4,935,000 m^3	1,027,159 m^3	2,229,589 m^3	2,182,836 m^3
	Discharge from Portage Attenuation Pond	Monitor discharge volumes and timing	Discharge volumes monitored	458,400 m^3/yr (max)	No discharge	No discharge	No discharge
	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)	133.55 – 133.86 masl	133.46 – 133.74 masl	133.63 – 133.75 masl See Section 12.4.1.1.2
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**	132.75 – 133.07 masl**	132.84 – 133.17 masl**
	Non-contact water diverted from Second Portage Lake drainage	Monitor discharge volumes of non-contact water	Lake levels monitored	Minor effect on lake level (baseline = 133.1 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 456,450 m^3 during open water months	No discharge; 139.25 - 139.66 masl**	No discharge; 139.34 – 139.65 masl**	No discharge, 139.31 – 139.64 masl**
Altered water levels in Turn Lake	Discharge from Phaser Lake for water management purposes during mining of Vault Pit	Monitor outflows at Turn Lake	Turn Lake water levels (2019+)	No significant impact.**	-	No discharge; 139.00 – 139.36 masl**	No discharge, 139.01 – 139.31 masl**

12.4.1.1.2 Parts 3 & 4: Discussion

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here.

12.4.1.1.2.1 ***Changes in Lake Levels***

FEIS Prediction:

Third Portage Lake - no change in lake levels (modeled range = 133.82 – 134.19 masl).

Second Portage Lake – minor change in lake levels (not quantitative).

Wally Lake – minor change in lake levels (not quantitative).

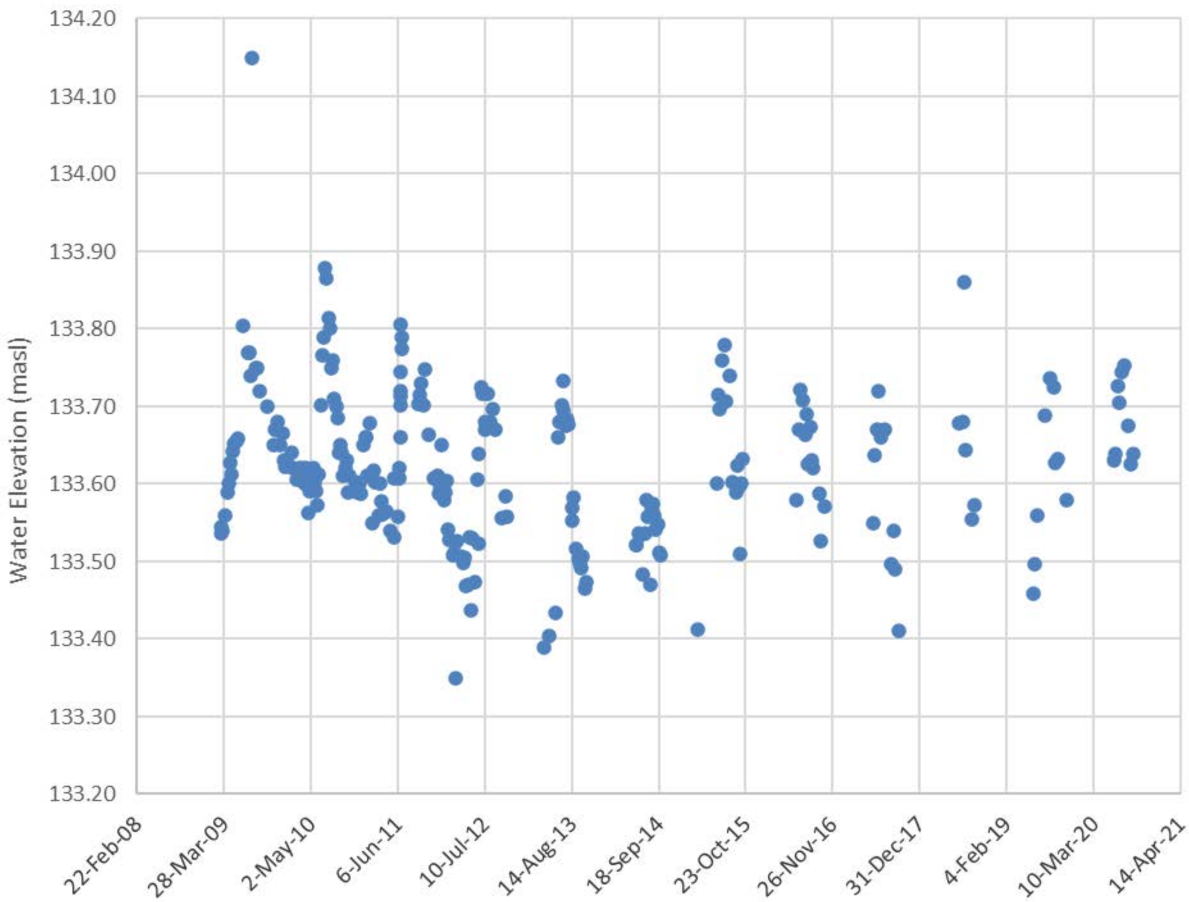
Turn Lake – no significant impact (not quantitative).

Discussion:

Third Portage Lake

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 or discharge) on March 14th, 2009 (133.54 masl). Pumping rates of freshwater from Third Portage Lake remained well within license limits in 2020, and water levels do not appear to have changed significantly since monitoring began (2009) (see Figure 42). Therefore, the Project does not appear to be having a significant impact on water quantity, rather baseline water levels may not have been well defined in the initial impact assessment.

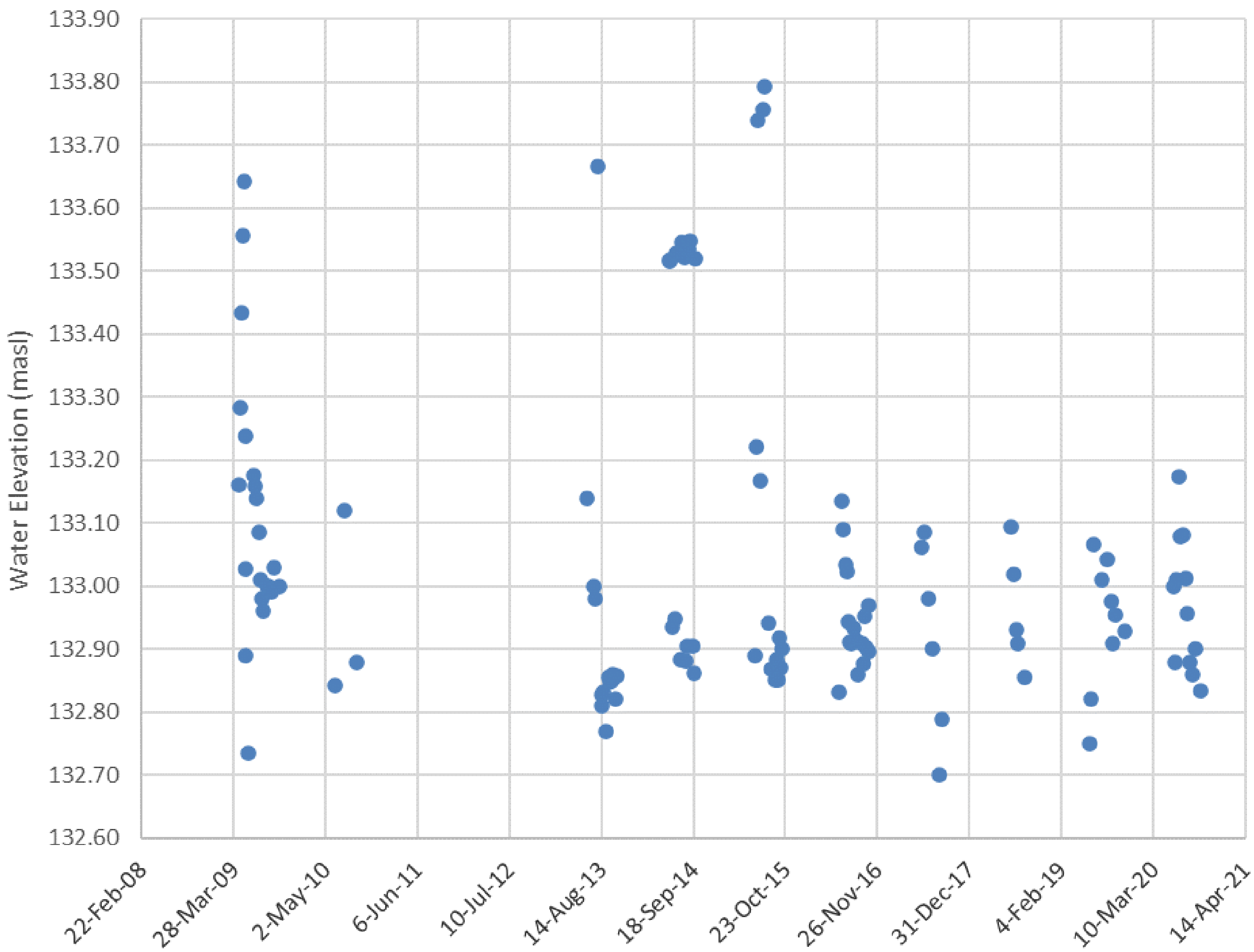
Figure 42 Measured water levels in Third Portage Lake (2009 – 2020)



Second Portage Lake

For Second Portage Lake, the FEIS predicted a "minor" effect on water levels. Since that prediction is not quantitative, historical measurements are reviewed here to identify any apparent trends that might arise. 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 2009 (when monitoring began) appear to be within this range (Figure 43).

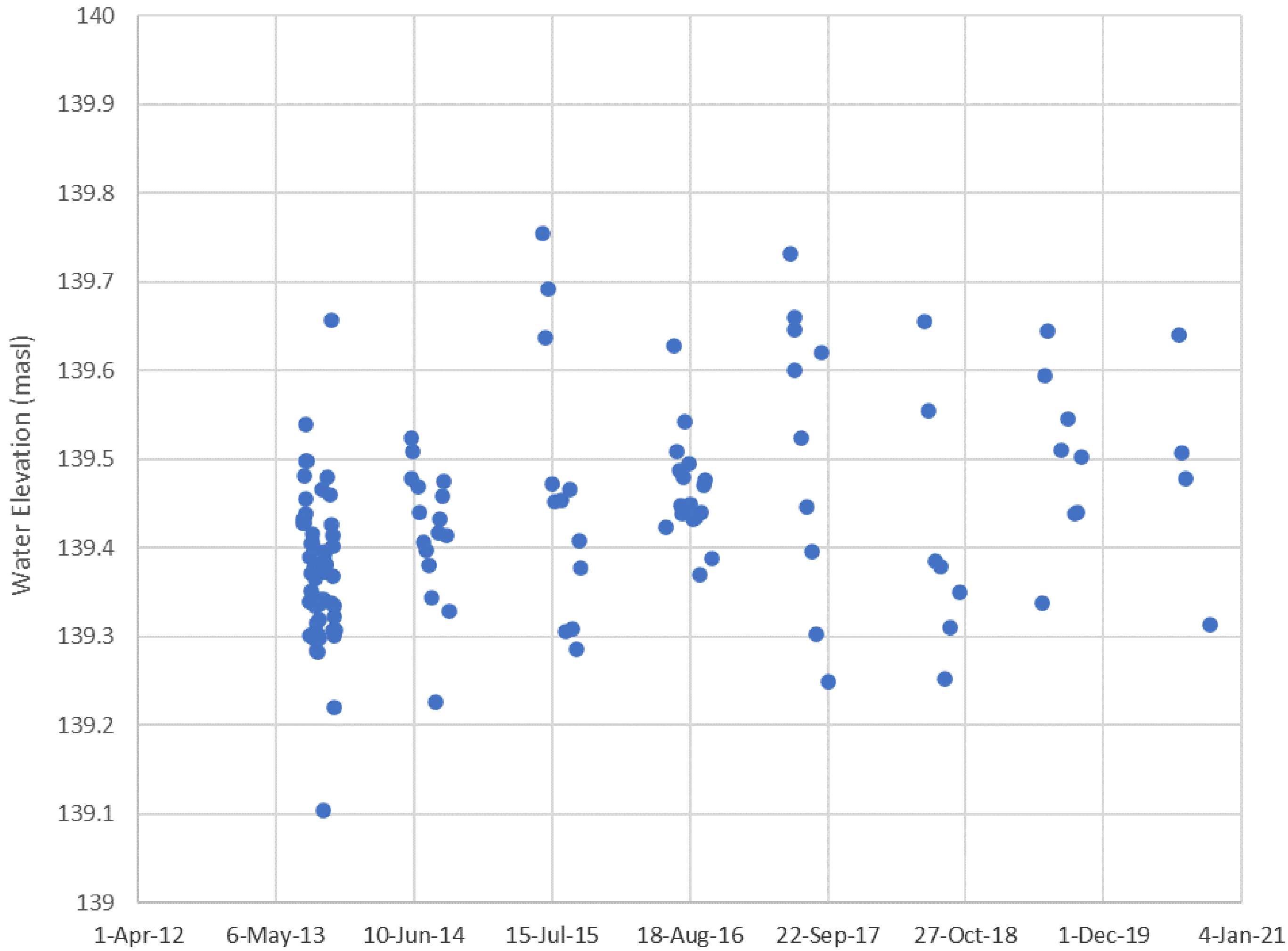
Figure 43 Measured water levels in Second Portage Lake (2013-2020)



Wally Lake

For Wally Lake, the FEIS predicted a "minimal" increase in water levels. Since that prediction is not quantitative, historical measurements are reviewed here to identify any apparent trends that might arise. No baseline measurements are available for Wally Lake, but since monitoring was required to begin in 2013, no clear upward or downward trends are observed (Figure 44).

Figure 44 Measured water levels in Wally Lake (2013-2020)



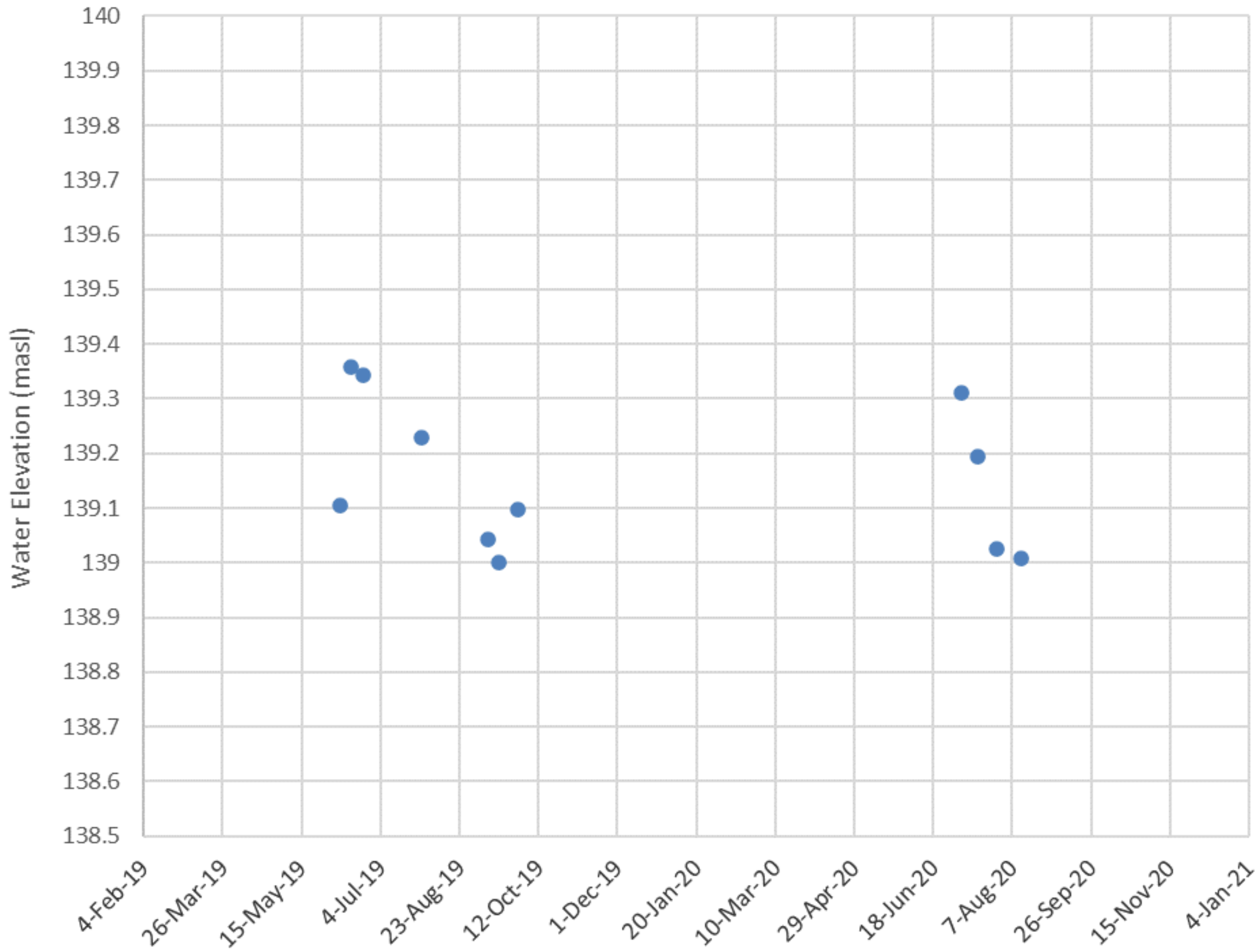
Turn Lake

In the original site FEIS (Cumberland, 2005) water management plans called for discharge from Phaser Lake to Turn Lake during mining of the Vault Pit. No significant impacts on water levels in Turn Lake were anticipated, but monitoring of outflows was recommended. However, in 2015, an FEIS Addendum was submitted to NWB as part of the permitting process for the Vault Pit expansion into Phaser Lake. Under that mine and water management plan, discharge to Turn Lake was no longer required, eliminating the potential residual impact of that activity and requirements for monitoring in Turn Lake.

However, in 2019, following recommendation from CIRNAC regarding the 2018 Annual Report, Turn Lake water level monitoring in the next open water season was completed, reported and compared to predictions.

No baseline water levels were provided in the 2005 FEIS or 2015 FEIS Addendum for Turn Lake so 2019 was the first year for which measurements are available (Figure 45). Similar water levels were observed in 2020.

Figure 45 Measured water levels in Turn Lake (2020)



12.4.1.1.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management

<u>Effectiveness of Monitoring</u>

Although FEIS predictions for changes to water quantity were rarely quantitative, the monitoring programs being implemented at the Meadowbank site are able to measure changes in receiving environment water levels. Monitoring programs are therefore considered effective.

<u>Effectiveness of Mitigation</u>

A summary of the FEIS-planned mitigation measures for surface water quantity along with a commentary on implementation in 2020 is provided in Table 12-4. Mitigation measures related to water quality and fish and fish habitat are provided in Section 12.3.1.2 and 12.3.1.3, respectively.

Table 12-4 Mitigation measures described in the FEIS to reduce impacts of the project to water quantity and commentary on current implementation

Planned Mitigation Measure (FEIS, Section 4.24.2.5)	Implementation (2020)
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.

Adaptive Management

Since no exceedances of FEIS predictions or updated license limits occurred, existing mitigation measures are considered to be effective as designed, and no adaptive management measures are proposed for 2021.

12.4.1.2 *Water Quality*

12.4.1.2.1 Parts 1 & 2: Summary of Predicted and Measured Residual Impacts

Aspects of the mine that were identified in the FEIS as potentially leading to significant impacts to water quality during operations (Cumberland, 2005; Table B5.2) are summarized Table 12-5, along with results of the monitoring programs aimed at assessing these impacts. This assessment focuses on comparing current measured effects with predicted impacts described in the Physical Environment Impact Assessment Report (2005) for receiving environment water quality. Associated monitoring programs are the CREMP and effluent monitoring under the MDMER.

The 2020 CREMP report (Appendix 33) 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 and referenced here. Complete results of effluent monitoring under the MDMER are provided in Section 8.3 above.

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. Monitoring results are compared to those predictions in Table 12-5 below. If exceedances occurred, cells are highlighted in grey and a discussion is provided in Section 12.4.1.2.2.

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 2020 CREMP report; Appendix 33). Exceedances of these model predictions are noted in Table 12-5, and a full discussion is provided in Section 12.4.1.2.2.

Table 12-5 Predicted and measured impacts to water quality. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.4.1.2.2. Potential impacts as described in Cumberland, 2005; Table B5.2 and the Physical Environment Impact Assessment Report (2005) for receiving environment water quality

Potential Impact	Potential Cause(s)	Proposed Monitoring	Actual Monitoring	Predicted Impact	Measured Impact		
					2018	2019	2020
Impaired Wally Lake water quality	Vault attenuation pond effluent discharge; dike leaching	Effluent and receiving environment monitoring	Receiving environment: CREMP water quality monitoring	CREMP results <CWQG except arsenic and cadmium.	CREMP results all <CWQG		
				Measured concentrations within model predictions	Some exceedances of model predictions - see Section 12.4.1.2.2		
			Effluent monitored under MDMER, NWB Water License	Effluent: <MDMER	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 water quality monitoring	CREMP results <CWQG except cadmium	CREMP results all <CWQG		
				Measured concentrations within model predictions	Some exceedances of model predictions - see Section 12.4.1.2.2		
			Effluent monitored under MDMER, NWB Water License	Effluent: <MDMER, Water License	Effluent: <MDMER and Water License Criteria		
Impaired Third Portage Lake water quality	Portage Attenuation pond effluent; dike leaching	Effluent and receiving environment monitoring	Receiving environment: CREMP water quality monitoring No effluent monitoring required.	CREMP results <CWQG except cadmium	CREMP results all <CWQG		
				Measured concentrations within model predictions	Some exceedances of model predictions - see Section 12.4.1.2.2		

12.4.1.2.2 Parts 3 & 4: Discussion

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here.

12.4.1.2.2.1 FEIS Model Predictions for Water Quality

FEIS Prediction: Concentrations <CCME water quality guidelines; "low" magnitude of effects.

Discussion: As described in the 2018 and 2020 CREMP Reports, a number of measured parameters exceeded FEIS water quality model predictions when these individual values are compared directly. However, 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 measured water quality results in comparison to FEIS water quality model predictions 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

Where CREMP monitoring results have exceeded FEIS water quality model predictions but did not exceed CCME water quality guidelines, CREMP thresholds, or otherwise determined adverse effects levels (as detailed below), they were still considered to have a "low" magnitude of impact, consistent with general FEIS predictions. As described in the 2019 CREMP Report, beginning in 2020, only annual means are formally screened against FEIS predictions, rather than comparisons for all individual monthly samples.

In 2020, parameters with annual means exceeding concentrations predicted in the FEIS water quality model were: ionic compounds (calcium and magnesium), hardness, total alkalinity, chloride, fluoride, and sulphate. Concentrations for these parameters in 2020 along with FEIS predictions are shown in Table 4-6 of the 2020 CREMP Report (Appendix 33), and results are further discussed with historical figures, below.

Measured values of calcium, magnesium, hardness, total alkalinity also regularly exceeded FEIS predictions in 2018 and 2019. Historical results for these constituents are shown in Figures 46 - 49 below, from the 2020 CREMP Report (Appendix 33). These water quality constituents do not have CCME guidelines and therefore the magnitude of significance was not explicitly predicted in the FEIS. A thorough review of the literature (2019 CREMP Report, Appendix J) suggests that the observed concentrations of these parameters are well below levels of concern for aquatic life. Therefore, following the intent of the FEIS magnitude ratings, these constituents would be considered consistent with a "low" magnitude of impact, because measured values regularly exceed baseline concentrations but are below concentrations associated with adverse effects.

Annual means for chloride, fluoride, and sulphate, and individual samples of ammonia, nitrate, and total phosphorus also exceeded the FEIS predictions for Third Portage Lake, Second Portage Lake, and Wally Lake in 2020. These same parameters had occasional exceedances in 2018 and 2019. For chloride, fluoride, and sulphate, historical results are shown here in Figures 50 - 52, from the 2020 CREMP Report. For these parameters, results (annual means) did not exceed CREMP triggers (95^{th} percentile of baseline) indicating current concentrations are representative of pre-development conditions so these constituents are also considered to represent a “low” magnitude of impact. Consistent with the 2020 CREMP methods for FEIS comparison, the isolated exceedances for ammonia, nitrate, and total phosphorus are not explored further, because mean annual concentrations were below FEIS predictions. Historical results for these parameters are provided in the 2020 CREMP Report.

Most metals were below the FEIS model’s predicted concentrations except for silicon (all three lakes), strontium (Third Portage Lake) and isolated instances of aluminum (2018 – 2020), copper, iron, manganese (2018 and 2019), silver (2018) and chromium (2019). As discussed in the 2019 and 2020 CREMP reports, silicon and strontium are not suitable for evaluating the accuracy of the FEIS predictions, and are therefore both excluded from the FEIS assessment. Consistent with the 2020 CREMP methods for FEIS comparison, the isolated instances of exceedances for other metals are not explored further, because mean annual concentrations were below FEIS predictions.

Based on these analyses, overall, 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.

Historical results for all other water quality parameters measured under the CREMP are provided in the 2020 CREMP Report (Appendix 33).

Figure 46 Total calcium (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value and blue dashed line = FEIS screening prediction.

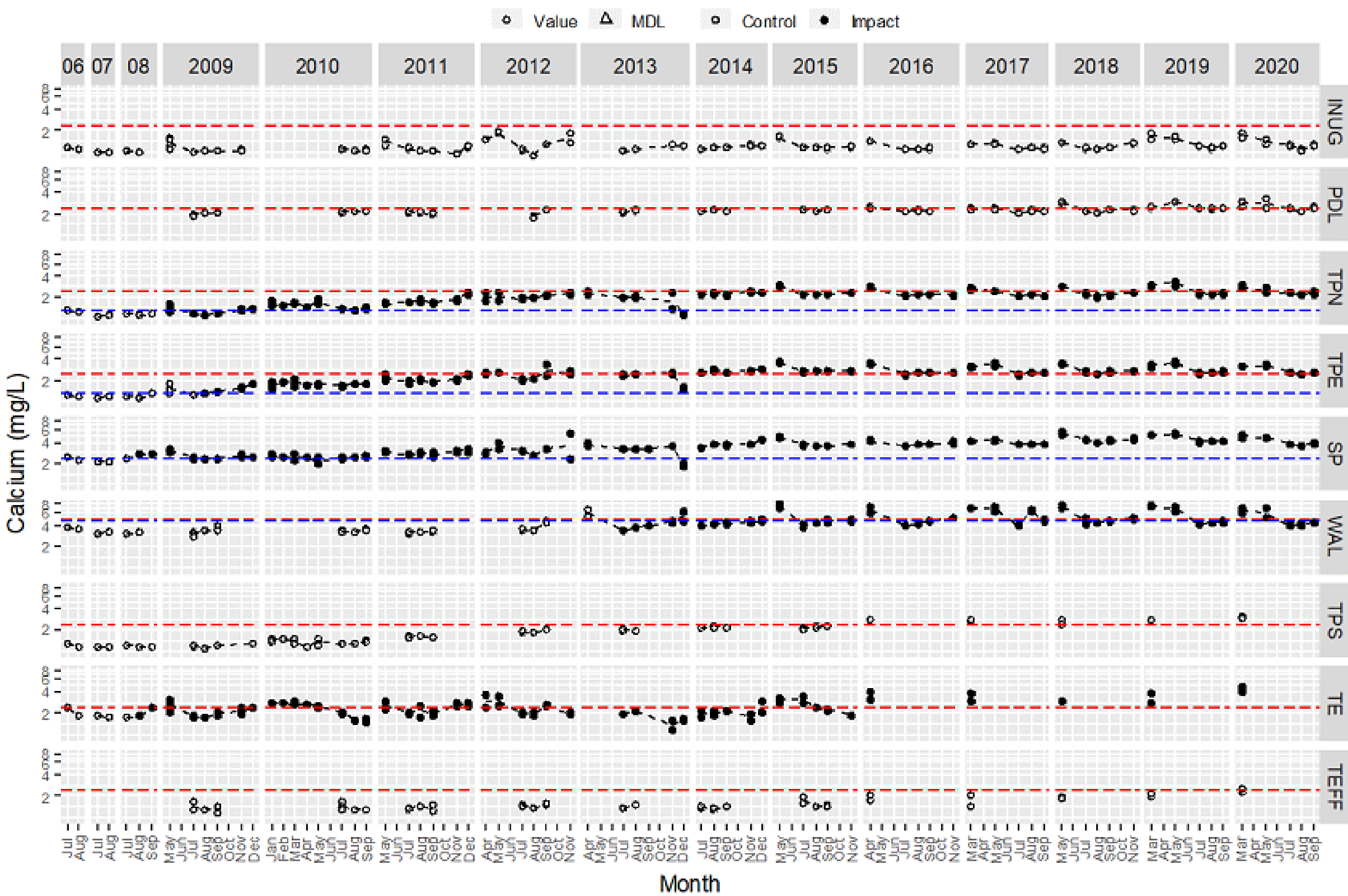


Figure 47 Total magnesium (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value and blue dashed line = FEIS screening prediction.

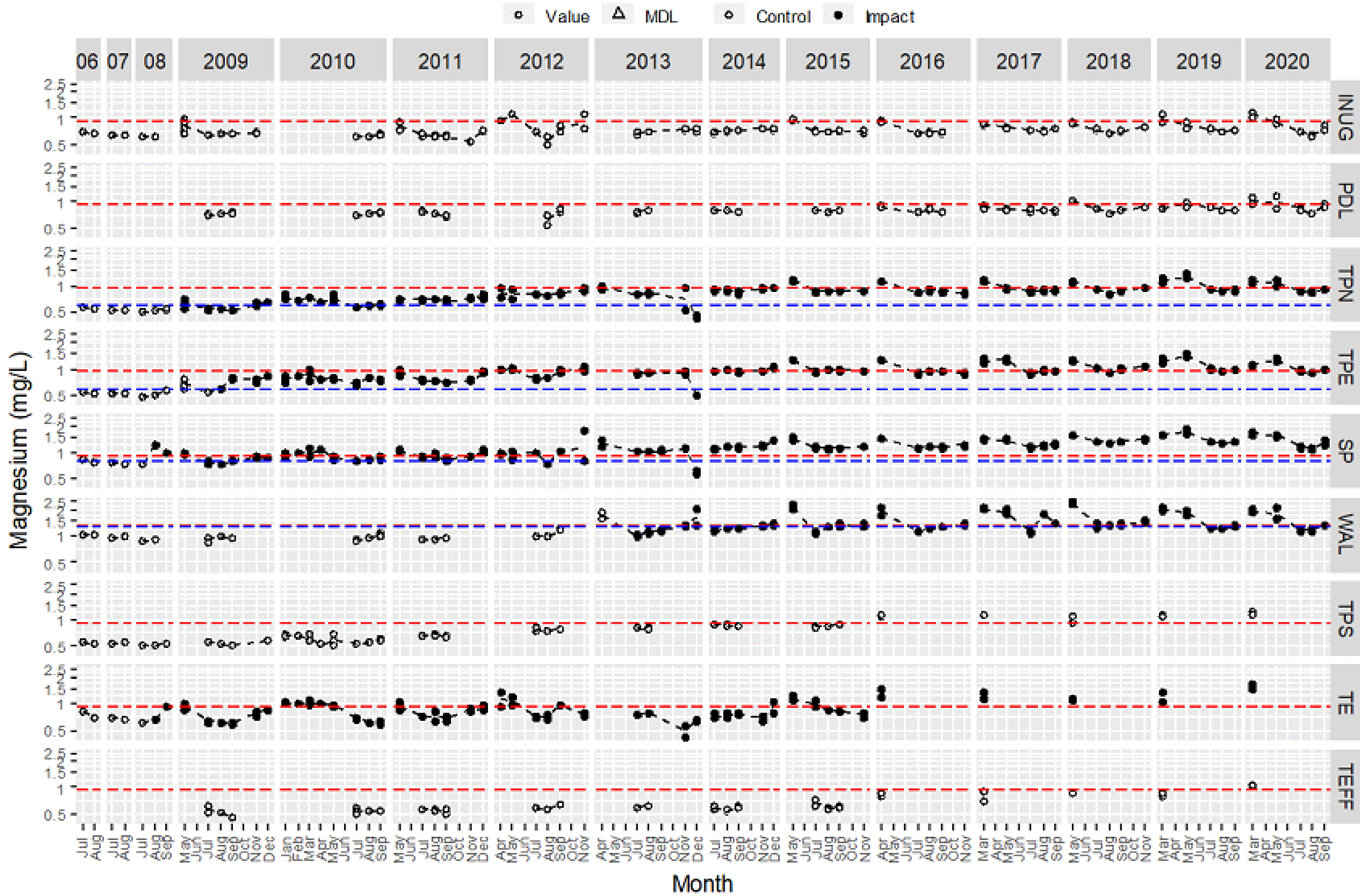


Figure 48 Laboratory-measured hardness (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value and blue dashed line = FEIS screening prediction.

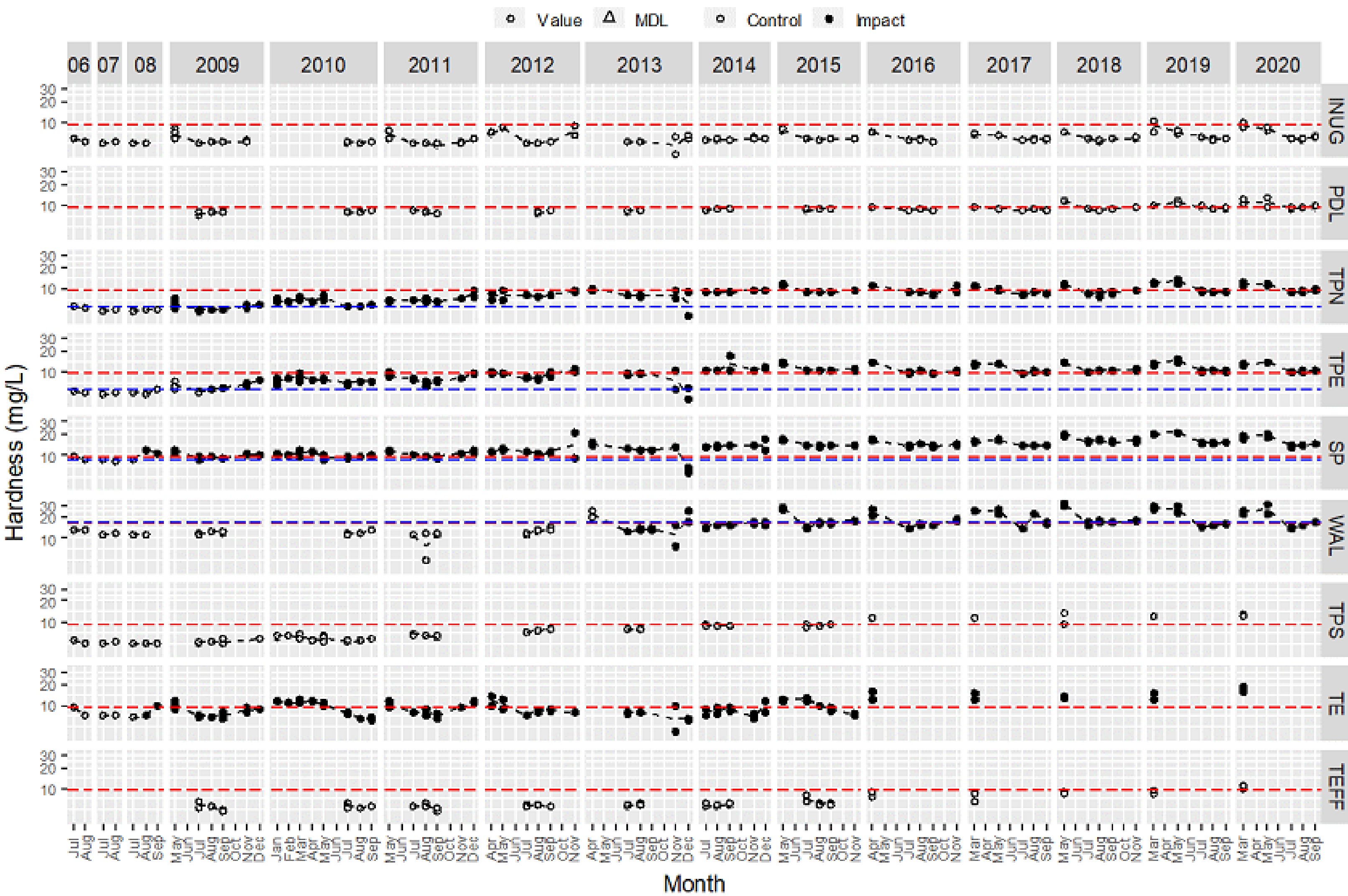


Figure 49 Total alkalinity (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value and blue dashed line = FEIS screening prediction.

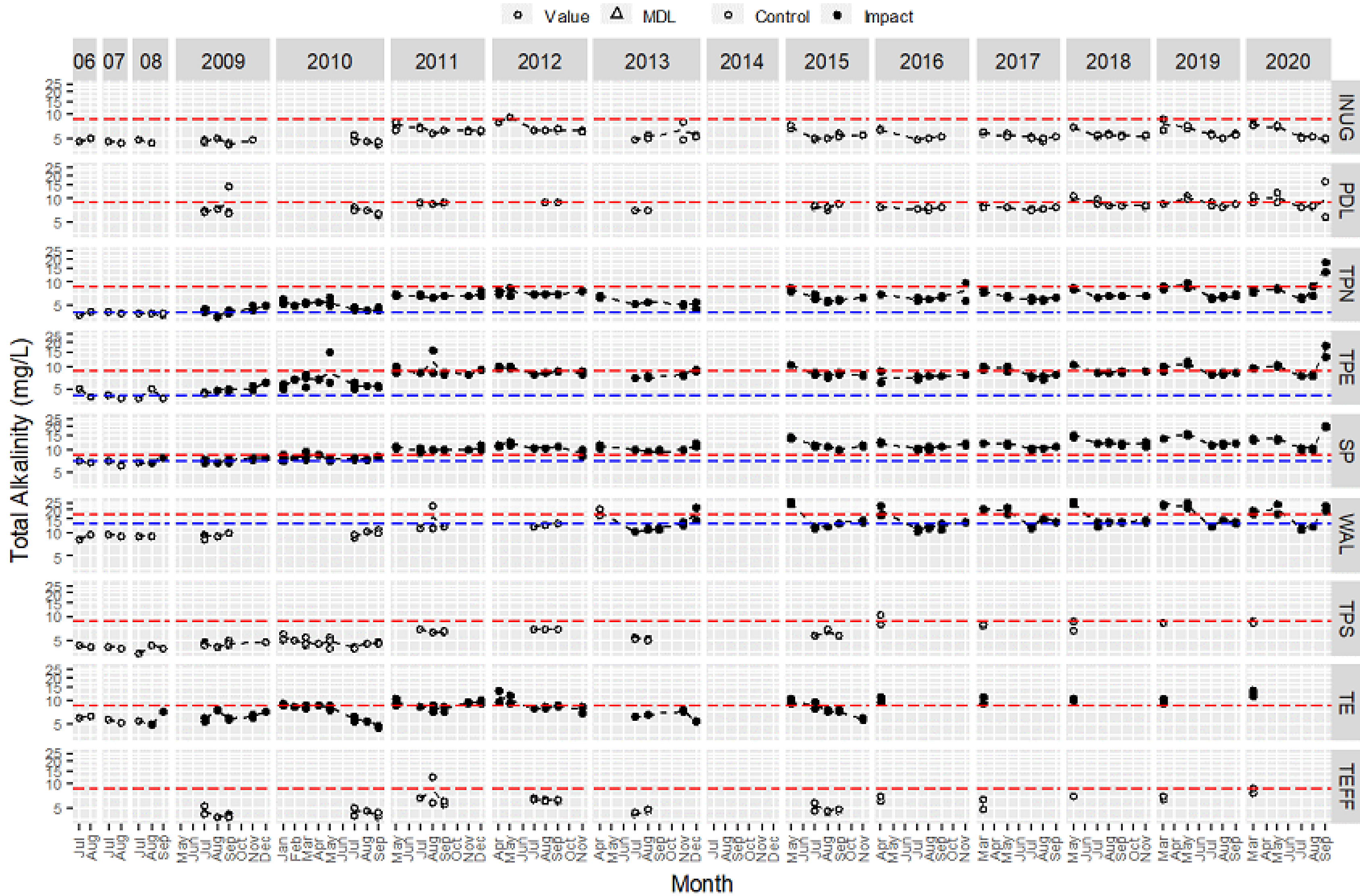


Figure 50 Chloride (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value and blue dashed line = FEIS screening prediction

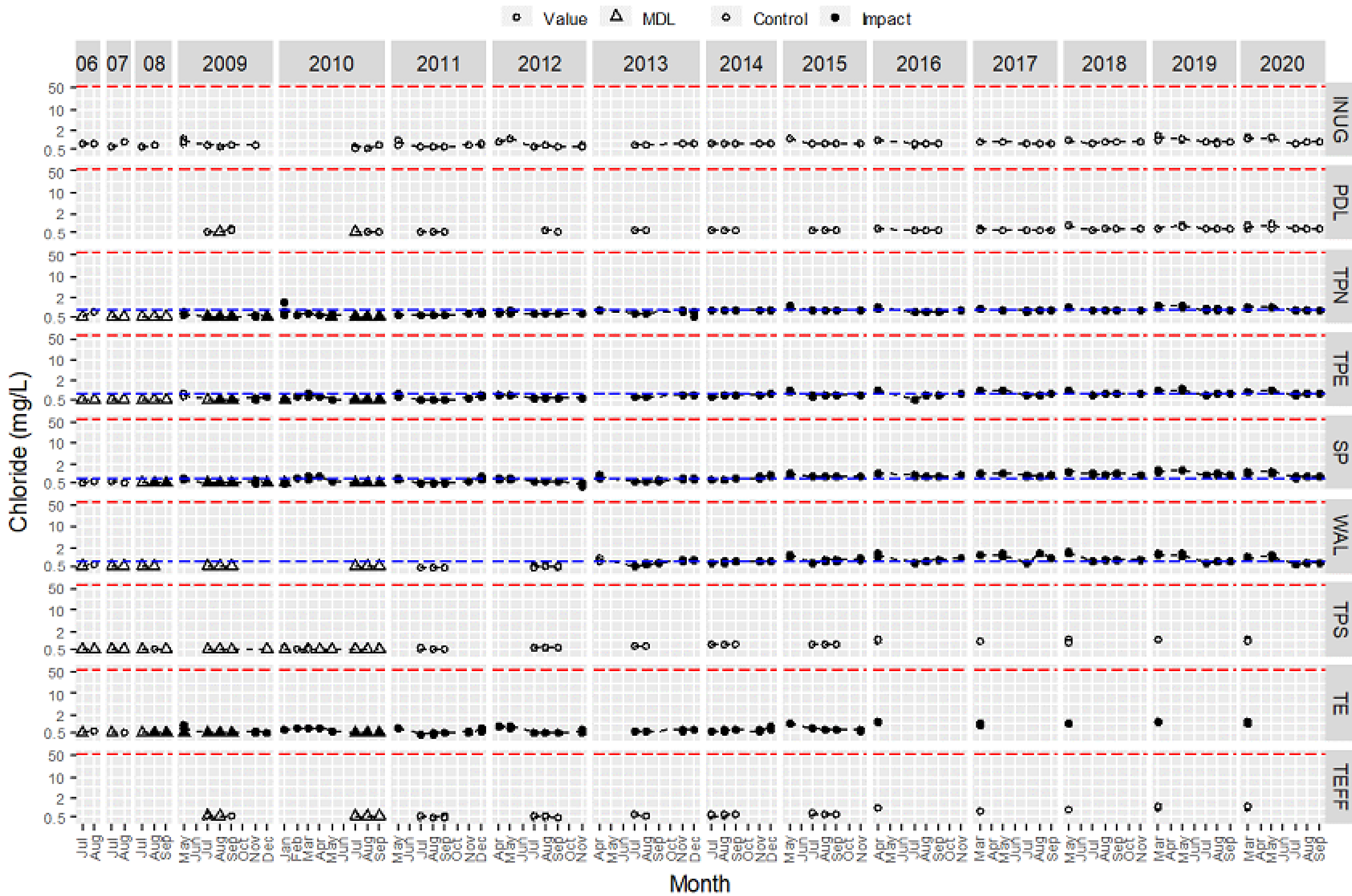


Figure 51 Fluoride (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value and blue dashed line = FEIS screening value

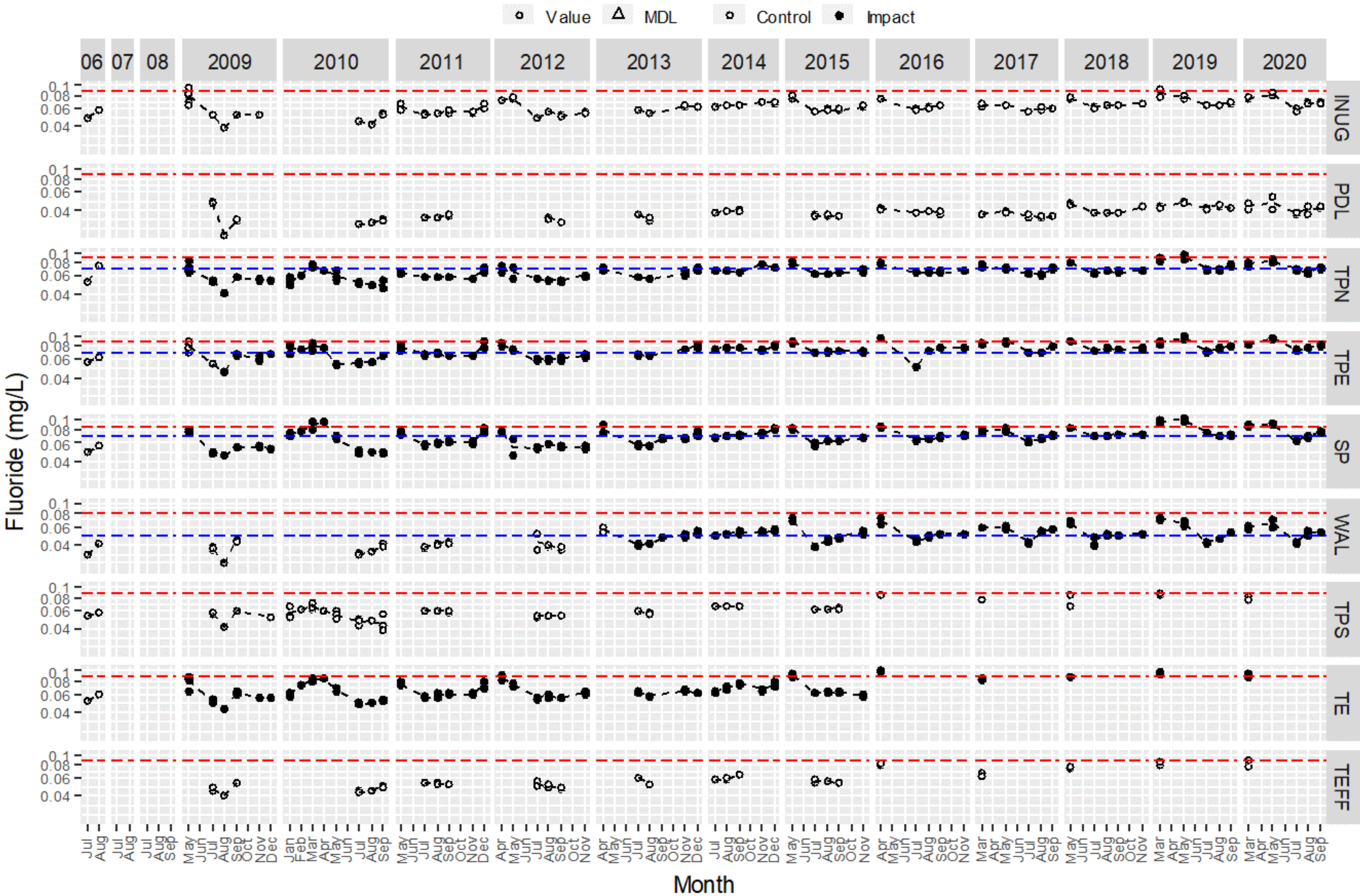
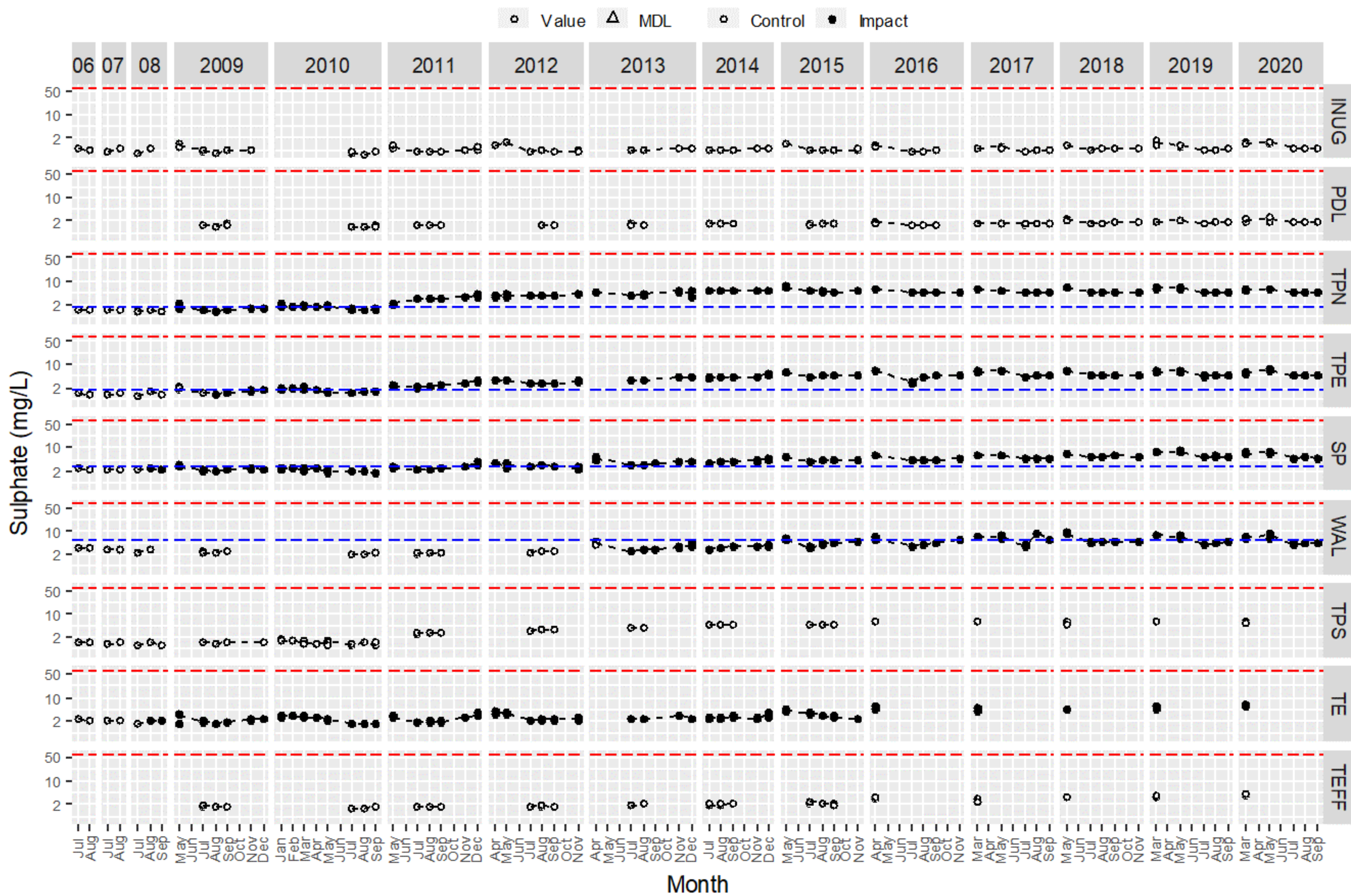


Figure 52 Sulphate (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value and blue dashed line = FEIS screening value



Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management

Effectiveness of Monitoring

Based on the results in Table 12-3, current monitoring programs are able to address all FEIS impacts for which monitoring was recommended (i.e. monitoring is considered effective).

Effectiveness of Mitigation

A summary of the FEIS-planned mitigation measures for surface water quality, along with a commentary on implementation in 2020 is provided in Table 12-4. Mitigation measured related to water quantity, and fish and fish habitat are provided in Section 12.3.1.1 and 12.3.1.3, respectively, though some overlap may occur.

Table 12-6 Mitigation measures described in the FEIS to reduce impacts of the project to water quality, and commentary on current implementation

Planned Mitigation Measure (FEIS, Section 4.24.2.5)	Implementation (2020)
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.
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.
Winter culvert installation	**N/A –** item not constructed in 2020
Sediment control (e.g. use of geotextile for Baker Lake marine barge landing facility)	**N/A –** item not constructed in 2020
Use of riprap to stabilize shorelines around culverts and anchor pipes	**N/A –** item not constructed in 2020
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

Adaptive Management

Historically and in 2020, a number of water quality parameters without regulatory guidelines exceeded CREMP trigger values. As an adaptive management measure described in the 2018 PEAMP, a more detailed assessment of the significance of changes in these water quality parameters was conducted in the 2019 CREMP Report (Appendix 35 of the 2019 Annual Report to the NIRB). In general, it was found that these parameters all represent essential elements, and adverse effects are more commonly associated with deficiency, rather than enrichment. The 2019 CREMP analysis therefore supported the ongoing assertion that water quality results continue to represent a "low" magnitude of impact and no exceedance of overall FEIS predictions is occurring. As a result, mitigation measures associated with water quality impacts (Table 12-6) are determined to be effective, and no supplemental mitigation is planned at this time.

As an additional adaptive management measure, Agnico committed in 2018 to developing CREMP triggers for those elements which are exceeding FEIS water quality model predictions (e.g. silicon in 2018), but for which no CCME guidelines or CREMP triggers already exist. This task was completed and is described in the 2019 CREMP report.

No additional adaptive management measures are planned for 2021, based on results of the above analysis.

12.4.1.3 *Fish and Fish Habitat*

12.4.1.3.1 Parts 1 & 2: Summary of Predicted and Measured Residual Impacts

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 Plans and No Net Loss Plans (NNLP) and associated aquatics monitoring (e.g. CREMP, Habitat Compensation Monitoring Plan, Blast Monitoring Plan). Results of these programs are summarized in relation to FEIS predictions for impacts to fish and fish habitat (Cumberland, 2005; Table B13.2) in Table 12-7, below.

Table 12-7 Predicted and measured impacts to fish and fish habitat. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.4.1.3.2. Potential impacts according to Cumberland, 2005; Table B13.2. NM indicates not required to be measured.

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted	Predicted Impact in FEIS	Measured Impacts		
					2018	2019	2020
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).	Structure, interstitial water quality, periphyton growth, fish use under HCMP	Dikes will provide a medium for lower trophic growth; habitat for non-spawning life functions except Goose Island dike where spawning may occur.	NM	Compensation features appear to be functioning as intended (continuing periphyton growth, fish presence around dikes). Interstitial water quality not assessed in 2019.	NM
	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.		
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 Blasting: Blast monitoring	Dike leachate: Interstitial water quality under HCMP 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 cadmium (Wally Lake) Blasting: Most blasts will not exceed DFO overpressure guideline (50 kPa); no	Dike leachate: NM Effluent: < MDMER Dust (whole-lake water quality under CREMP): CREMP results <CWQG. Blasting: No exceedances of DFO overpressure guideline (50 kPa); no exceedances of PPV guideline (13 mm/s)		Dike leachate: NM Effluent: < MDMER Dust (whole-lake water quality under CREMP): CREMP results <CWQG. Blasting: NM - mining operations ceased in 2019

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted	Predicted Impact in FEIS	Measured Impacts 2018	2019	2020
				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)		NM - mining operations ceased in 2019
	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: None - creel survey updates in development	Unknown	Worker fishing: Not assessed 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 waterbodies as a result of spills.		
Fish stress, behavioral changes, avoidance	Increased concentrations of dissolved metals and TSS from dust and effluent discharge	Dust: Whole-lake water quality monitoring under CREMP Effluent: Monitoring under MDMER program	Dust: Whole-lake water quality under CREMP Effluent: MDMER monitoring	Dust (whole-lake water quality under CREMP): negligible ecological effect; <CWQG for aquatic life (CCME) except cadmium (TPL), and arsenic and cadmium (Wally Lake) Effluent: < MMER criteria	Dust (whole-lake water quality under CREMP): CREMP results <CWQG, no exceedance of TSS trigger. 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	Interstitial water quality under HCMP	Dike faces will provide a medium for periphyton growth	NM	Not sampled in 2019	NM
	Sedimentation	Water quality	CREMP (water	Negligible ecological	CREMP results <CWQG, no mine-related		

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted	Predicted Impact in FEIS	Measured Impacts 2018	Measured Impacts 2019	Measured Impacts 2020
	through dust/particulate dispersion (road dust, wind dispersal, terrain disturbance) and effluent discharge	monitoring through CREMP	quality, sediment, and lower trophic level monitoring)	effect; CREMP results <CWQG for aquatic life (CCME) except cadmium (TPL), and arsenic and cadmium (Wally Lake)	impairment of phytoplankton, benthic invertebrate communities. Some exceedances of CREMP sediment thresholds. See Section 12.4.1.3.2.		
		Effluent MDMER monitoring	Effluent MDMER monitoring	Settling of TSS and altered sediment chemistry may impact benthos.	Effluent < MDMER		
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	NM - Treated sewage is now 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)	Hoopnet and flow monitoring under AWAR Fisheries Monitoring Plan (complete in 2011 after 5 years)	Negligible residual impact on fish and their movements within streams and channels	Program complete in 2011. No impairment of fish passage was observed.		

12.4.1.3.2 Parts 3 & 4: Discussion

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here.

12.4.1.3.2.1 Exceedance of CREMP sediment thresholds

FEIS Prediction: Negligible ecological effect on lower trophic levels.

Discussion: Historical and 2020 CREMP results have indicated mine-related increases in chromium in sediment for one receiving environment location (TPE). As a result, targeted studies assessing the ecological significance (potential for impact to lower trophic levels) of chromium increases in TPE occurred in 2015, 2018, and 2019. At the conclusion of the 2019 studies, results were determined to clearly demonstrate that the increase in sediment chromium at TPE is not adversely affecting the benthos at TPE (i.e. there is negligible ecological effect on lower trophic levels, and FEIS predictions are not being exceeded). No further targeted studies are planned at this time other than annual monitoring of the benthos community as part of the routine CREMP, along with annual sediment grab samples and a sediment coring program every 3 years**.**

For reference, historical results for chromium in sediment at TPE and benthic invertebrate abundance are shown in Figures 53 and 54, from the 2020 CREMP report. A complete description of the chromium investigation is provided in the 2019 CREMP Report.

As in previous years, results of sediment coring in 2020 indicated exceedances of sediment triggers for arsenic at Wally Lake, and zinc in Second Portage Lake and Third Portage Lake East. However, neither of these situations were found to be attributable to mine activities.

Figure 53 Total chromium (mg/kg) in sediment samples (grabs and cores) from Meadowbank project lakes since 2006. The red dashed line – CREMP trigger value.

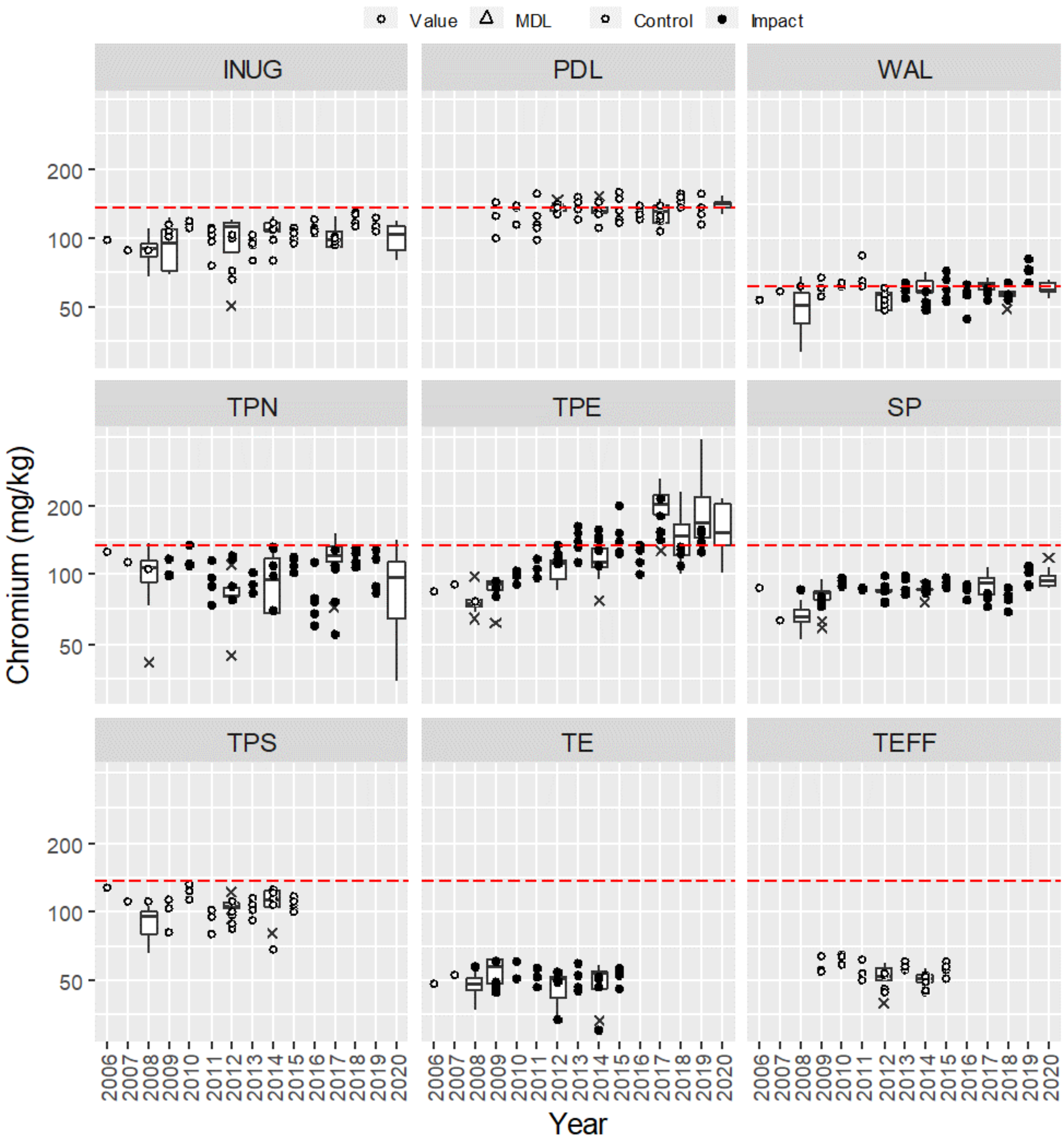
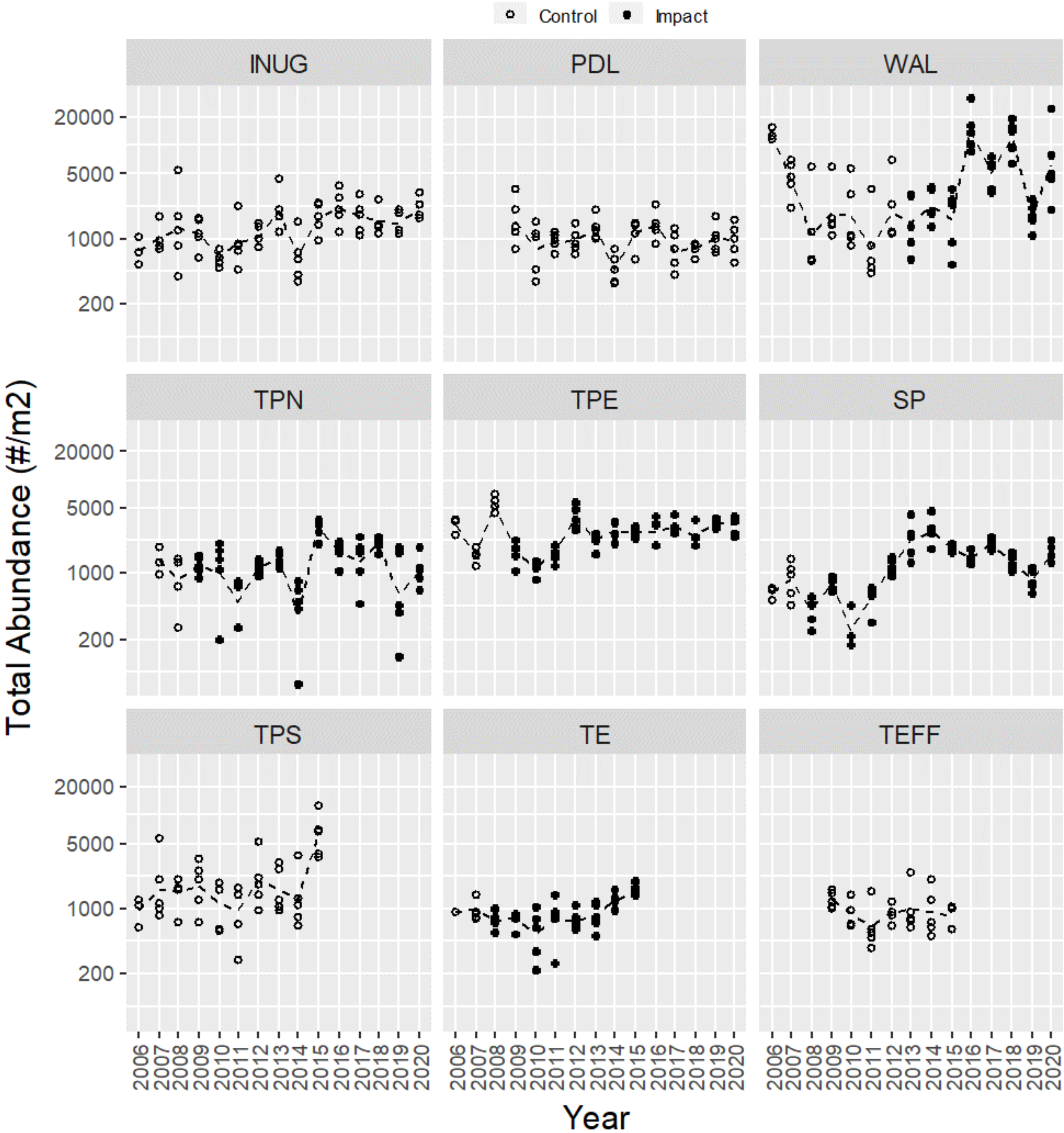


Figure 54 Benthic invertebrate total abundance (#/m²) from Meadowbank project lakes since 2006.



12.4.1.3.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management

Effectiveness of Monitoring

In 2020, monitoring was able to address all potential causes of impacts identified in the FEIS (i.e. monitoring was considered effective), except worker fishing.

While the FEIS proposed staff interviews to assess any fishing being conducted despite a strict no-fishing policy onsite, in practice it has become clear that interviews are not required. To the best of knowledge, no cases of fishing by workers in contravention to the policy have ever been observed or reported. Despite the lack of formal monitoring, it is clear that this is not a significant source of potential impacts to area fish populations.

Effectiveness of Mitigation

A summary of the FEIS-planned mitigation measures related to fish and fish habitat, along with a commentary on implementation in 2020 is provided in Table 12-8. Mitigation measured specifically related to water quantity and water quality are provided in Sections 12.4.1.1.3 and 12.4.1.2.3, respectively, though some overlap may occur.

Table 12-8 Mitigation measures described in the FEIS to reduce impacts of the project to fish and fish habitat, and commentary on current implementation

Planned Mitigation Measure (FEIS, Section 4.24.2.5)	Implementation (2020)
Winter culvert installation	**N/A –** item not constructed in 2020
Sediment control (e.g. use of geotextile for Baker Lake marine barge landing facility)	**N/A –** item not constructed in 2020
Use of properly sized screens for freshwater intake	**N/A –** item not constructed in 2020
Use of riprap to stabilize shorelines around culverts and anchor pipes	**N/A –** item not constructed in 2020
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

Adaptive Management

Based on these results, no specific adaptive management actions are planned for 2021.

12.4.2 Vegetation, Terrestrial Wildlife, and Birds

12.4.2.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

The 2020 Wildlife Monitoring Summary Report (Appendix 47) provides a complete assessment of wildlife monitoring programs including a comparison to monitoring thresholds detailed in the Terrestrial Ecosystem Management Plan (TEMP Version 7; 2019) and FEIS impact predictions (Cumberland, 2005), where available. Results are summarized here in the PEAMP format.

For each terrestrial VC, a summary of predicted impacts and the accuracy of those predictions (observed impacts) as determined through various monitoring programs conducted under the TEMP is provided in Table 12-9. Thresholds for the implementation of adaptive management, as developed in the Terrestrial Ecosystem Management Plan (TEMP Version 7; 2019) were used in this comparison because most impact predictions in the Terrestrial Ecosystem Impact Assessment of the FEIS (Cumberland, 2005) were qualitative only. The 2019 TEMP thresholds were developed in consultation with the Terrestrial Advisory Group (TAG), and represent quantitative measurement endpoints that trigger management action.

In the 2018 TEMP (Version 5), a Caribou Management Decision Tree replaced most thresholds previously associated with caribou monitoring through various TEMP programs. An objective of the decision chart approach is to reduce sensory disturbance to Caribou approaching the project. The objective is not linked to an impact prediction as the monitoring is in place to trigger mitigation rather than to test a threshold. Quantitative thresholds are still in place for most other potential impacts – habitat loss, project- and vehicle-related mortalities, hunting by Baker Lake residents, disturbance of nesting raptors and waterfowl, and exposure to contaminated water or vegetation.

Overall, no Terrestrial Ecosystem Monitoring Program thresholds were exceeded for the Meadowbank site and AWAR in 2020.

Table 12-9 Predicted and measured impacts to terrestrial VECs, according to the Wildlife Monitoring Summary Report (Appendix 47). Measured impacts exceeding or potentially exceeding impact predictions/thresholds are shaded grey and further discussed in Section 12.4.2.2. NM = not required to be measured in the identified year. NA = no threshold or impact no longer assessed. *Potential impact and associated monitoring identified in the TEMP (2019), but not the original Meadowbank FEIS. ^Threshold for Meadowbank Complex (Meadowbank + Whale Tail sites combined).

Potential Impact	Potential Cause(s)	Proposed Monitoring	Current Monitoring	Threshold/ Prediction	Measured Impact		
					2018	2019	2020
VEGETATION (WILDLIFE HABITAT)							
Habitat Loss	Mine site footprint, pits, roads, water management and collection systems	Pit and mine-site ground surveys, Mapping, GIS Analysis	Pit and mine-site ground surveys, Mapping, GIS Analysis	Predicted/Permitted Area + threshold over prediction: Mine Site – 867/1532 ha + 5% AWAR/Vault Haul Road – 281/348 ha + 5%	Mine Site - 1,129 ha AWAR – 173 ha	NM (next assessed in 2021)	
Habitat Degradation by Contamination	Dust from roads, TSF, airstrip	Vegetation and Soil Samples (SLRA)	Vegetation and Soil Samples (SLRA)	No excess mine-related risk	NM	NM (next assessed in 2020)	NM (2020 assessment postponed to 2021)
UNGULATES							
Sensory Disturbance	Avoidance due to noise and activity (roads, airstrip, mine site)	Pit and mine-site ground surveys, Satellite-collaring	Satellite-collaring data; Road surveys; Pit and mine-site ground surveys; Remote cameras	No threshold beginning in 2019 – Caribou Management Decision Tree in place	Potential exceedance of threshold (avoidance of habitat will not occur more than 500 m from site; 1000 m from AWAR) See discussion, Section 12.4.2.2 of the 2018 Annual report.	NA	
Project-related Mortality	Mine-related activities (e.g., falling into pits,	Pit and mine-site ground surveys	Pit and mine-site ground surveys	Two (2) Caribou or Muskoxen mortalities per year^	None	None	None

Potential Impact	Potential Cause(s)	Proposed Monitoring	Current Monitoring	Threshold/ Prediction	Measured Impact		
					2018	2019	2020
	tailing, sludge or other means)						
Vehicle Collisions	Vehicular collisions	Pit and mine-site ground surveys, Incidence reports	Pit and mine-site ground surveys, Incidence reports	Two (2) Caribou or Muskoxen mortalities per year^	None	None	1 caribou mortality from assumed vehicle strike
Habitat Loss and Degradation	Mine site footprint, pits, roads, water management and collection systems	Pit and mine-site ground surveys, Mapping, GIS Analysis	Pit and mine-site ground surveys, Mapping, GIS Analysis	High Suitability Habitat Predicted/Permitted Area + threshold over prediction: Growing – 240/531 ha + 10% Winter – 191/407 ha + 10%	Growing – 372 ha (70%) Winter – 280 ha (68.8%)	NM (next assessed in 2021)	
Hunting by Baker Lake Residents	Improved access to hunting along the AWAR	Hunter Harvest Study	Hunter Harvest Study	< 20% increase of historical harvest activities within the RSA; no significant impact to herds	NM	64% of harvest in RSA in 2019 compared to 67% baseline	Threshold not exceeded
Exposure to Contaminated Water or Vegetation	Consumption of contaminated dust deposited on vegetation	Vegetation and Soil Samples (SLRA)	Vegetation and Soil Samples (SLRA)	No excess mine-related risk	NM	NM (next assessed in 2020)	NM (2020 assessment postponed to 2021)
PREDATORY MAMMALS							
Project-related Mortality	Mine-related mortality (falling into pits, TSF or other means)	Pit and mine-site ground surveys, Incidence reports	Pit and mine-site ground surveys, Road Surveys, Incidence reports, Height-of-Land Surveys	Destruction of two (2) problem Grizzly Bear, Wolverine, or Wolf per year^	One wolverine mortality	One wolverine mortality at Whale Tail Camp	Two wolverine mortalities

Potential Impact	Potential Cause(s)	Proposed Monitoring	Current Monitoring	Threshold/ Prediction	Measured Impact		
					2018	2019	2020
	Vehicular collisions	Pit and mine-site ground surveys, Incidence reports	Road surveys; Security surveys	Two mortalities of Grizzly Bear, Wolverine, or Wolf per year due to vehicle collisions^	-	None	None
Sensory Disturbance to Denning Predators*	Blasting, vehicles, and ground personnel near active dens	Active den site surveys (WT FEIS)	Ground surveys, vehicle surveys, and Viewshed surveys. Active den sites identified during baseline studies will also be monitored.	1 den failure	NA	No dens observed	No dens observed
SMALL MAMMALS							
Project-related Mortality	Vehicular or air traffic collisions, falling into pits, TSF or other means	Pit and mine-site ground surveys, Road Surveys, Incidence reports	Pit and mine-site ground surveys, Road Surveys, Incidence reports	No threshold beginning in 2019	Two artic hare mortalities along the AWAR	NA	
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 beginning in 2018	NA	NA	
Exposure to Contaminated Water or Vegetation	Consumption of contaminated dust deposited on vegetation	Vegetation and Soil Samples (SLRA)	Vegetation and Soil Samples (SLRA)	No excess mine-related risk	NM	NM (next assessed in 2020)	NM (2020 assessment postponed to 2021)
RAPTORS							

Potential Impact	Potential Cause(s)	Proposed Monitoring	Current Monitoring	Threshold/ Prediction	Measured Impact		
					2018	2019	2020
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.	NA	NA	NA
Disturbance of Nesting Raptors	Noise and Activity	Active Nest Monitoring	Pit and mine site ground surveys; Incidental wildlife reporting; Dedicated raptor nest surveys; Road surveys	One nest failure per year^	Threshold not exceeded (note - limited data on nesting success – See Section 12.4.2.3)		
Project-related Mortality	Vehicle collisions	Road/Ground Surveys, Incidence reports	Road surveys, Incidence reports	One mortality per year^	Threshold not exceeded	None	None
WATERBIRDS							
Disturbance of Nesting Waterfowl	Noise and Activity; dewatering	Waterfowl Nest Surveys	Waterbird Nest Surveys; Pit and mine site ground surveys	One nest failure per year^	Threshold not exceeded	Program replaced in 2019 with Migratory Bird Protection Plan for the Whale Tail site (Section 12.5.2)	
Habitat Loss and Degradation	Mine site footprint, pits, roads, water management and collection systems	Ground Surveys, Mapping, GIS Analysis	Ground Surveys, Mapping, GIS Analysis	High Suitability Habitat Predicted/Permitted Area + threshold over prediction: Mine Site – 518/417 ha + 10% AWAR/Vault Haul	NM	NM (next assessed in 2021)	

Potential Impact	Potential Cause(s)	Proposed Monitoring	Current Monitoring	Threshold/ Prediction	Measured Impact		
					2018	2019	2020
				Road – 22/348 ha +10%			
Exposure to Contaminated Water or Vegetation	Mine site dust; Secondary containment structures and tailings storage facilities	Vegetation and Soil Samples (SLRA)	Vegetation and Soil Samples (SLRA)	No excess mine-related risk	NM	NM (next assessed in 2020)	NM (2020 assessment postponed to 2021)
Project-related Mortality	Vehicle collisions	Road Surveys, Incidence reports	Road Surveys, Incidence reports	One mortality per year due to vehicle collision^	Threshold not exceeded	None	None
Project-related Mortality	Mine site-related mortality	Pit and mine-site ground surveys	Pit and mine-site ground surveys	One mortality per year due to mine activity other than vehicle collisions^	Two Long-tailed ducks found dead onsite. See Section 12.4.2.2.	None	None
OTHER BREEDING BIRDS							
Project-related Mortality	Vehicle/ bird collisions	Pit and mine-site ground surveys, Incidence reports	Pit and mine-site ground surveys, Road Surveys, Incidence reports	No threshold beginning in 2019	Threshold not exceeded (50 mortalities)	NA	
Habitat Loss and Degradation	Mine site footprint, pits, roads, water management and collection systems	Pit and mine-site ground surveys, Mapping, GIS Analysis	Pit and mine-site ground surveys, Mapping, GIS Analysis	High Suitability Habitat Predicted/Permitted Area + threshold over prediction: Mine Site – 322/736 ha + 10% AWAR/Vault Haul Road – 170/348 ha +10%	-	NM (next assessed in 2021)	

Potential Impact	Potential Cause(s)	Proposed Monitoring	Current Monitoring	Threshold/ Prediction	Measured Impact		
					2018	2019	2020
Exposure to Contaminated Water or Vegetation	Mine site dust	Vegetation and Soil Samples (SLRA)	Vegetation and Soil Samples (SLRA)	No excess mine-related risk	NM	NM (next assessed in 2020)	NM (2020 assessment postponed to 2021)
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	Suspended in 2015.	For PRISM plots, threshold was > 20% from control plots.	NA	Analytical report to be completed for CWS in 2020 to determine ongoing monitoring requirements.	Analytical report provided to CWS in 2020. Response pending.

12.4.2.2 *Parts 3 & 4: Discussion*

Where impacts are exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here. In 2020, no thresholds were exceeded. The discussions below are retained from previous years.

1. Sensory Disturbance of Ungulates (2018)

TEMP Threshold (2018): Avoidance of habitat will not occur more than 500 m from site; 1000 m from AWAR (threshold replaced with Caribou Management Decision Tree in TEMP Version 5, June 2018).

***Discussion*:** In 2018, review of caribou data also lead to a TAG project to explore the link between caribou road crossings and road closures. Most 2018 Caribou activity was observed during the spring migration requiring numerous road closures and restrictions along the Meadowbank AWAR and the haul roads. 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. Results of this study were presented to the TAG in 2019, and the goal is to incorporate them into monitoring and management plans moving forward.

Through discussions with the TAG, the Caribou Management Decision Tree replaced most thresholds related to caribou in Version 5 of the TEMP (June, 2018). As a result, caribou monitoring results are no longer compared to the 500 m/1000 m avoidance threshold. Decisions and outcomes resulting from the use of the decision tree approach will be analyzed and discussed in TAG meetings annually to determine whether adjustments to the program need to be made. In this way, Caribou monitoring endpoints assessed through TEMP programs are linked directly to management actions rather than a single threshold of impacts.

2. Project-Related Mortality of Waterbirds (2018)

TEMP Threshold (ongoing): No more than 1 mortality/year.

Discussion: 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 (see Table 12-10). Based on this data, there is no clear trend towards increasing mortalities of waterbirds on the Meadowbank site. Since the threshold of one mortality per year has only been exceeded twice in nine years (two mortalities each time), and on average, annual mortalities do not exceed the threshold, these results do not represent a significant departure from impact predictions.

Table 12-10 Historical waterbird mortalities at the Meadowbank site. The annual threshold is one mortality

Year	Waterbird Mortalities	Cause/Notes
2011	0	-
2012	0	-
2013	0	-
2014	0	-
2015	2	Dead duck found outside a building. Dead Canada Goose found in the tailings pond.
2016	1	Dead juvenile Merganser duck was caught in gill nets during the Phaser Lake fish-out program.

Year	Waterbird Mortalities	Cause/Notes
2017	0	-
2018	2	Two ducks killed after apparently flying into a building.
2019	0	-
2020	0	-

12.4.2.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

Based on the results in Table 12-9, current TEMP monitoring programs are able to address most FEIS impacts for which monitoring was recommended (i.e. monitoring is considered effective), with the exception of raptor nesting success, due to limited statistical power. Monitoring programs are in place to assess impacts to raptors, but the small number of nests monitored annually do not allow for the statistical power to determine whether potential nest failures are mine-related. Although this threshold cannot be specifically assessed, management and mitigation approaches are enacted according to the 'Peregrine Falcon Management and Protection Plan on the Meadowbank Gold Project Site' (see Appendix E of the 2019 TEMP).

Some monitoring requirements have been eliminated in the TEMP since the FEIS was developed, in consultation with regulators (e.g. habitat loss for small mammals, waterbird surveys outside of the Whale Tail flood zone).

Effectiveness of Mitigation

FEIS-planned mitigation measures to limit impacts of the Project on terrestrial wildlife were originally described in the Terrestrial Ecosystem Management Plan (Version 1, October 2005), a component of the Project FEIS (Cumberland, 2005). This plan was most recently updated in June, 2019 (Version 7), and a mitigation audit is a component of this plan. The audit is to be undertaken annually, with results summarized in the annual Wildlife Monitoring Summary report, and focuses specifically on mitigation listed in Section 2 of the June 2019 TEMP.

The audit will evaluate:

- What mitigation has been implemented;
- Which mitigation is perceived to be, or shown to be successful;
- If new mitigation has been implemented in response to new issues; and
- If some mitigation is redundant.

In 2019, Agnico Eagle took a staged approach to the mitigation audit (e.g., review of safety barriers, berms, and designed crossings along the Whale Tail Haul Road).

However, in the context of the PEAMP evaluation, mitigation is considered effective if impact predictions (or in this case, TEMP thresholds) are not being exceeded. Therefore, since no TEMP thresholds were exceeded in 2020, mitigation is considered effective.

Adaptive Management

Although no TEMP thresholds were exceeded in 2020, several management recommendations are planned to be implemented in 2021 along with continued implementation of all TEMP monitoring and management programs. As described in the 2020 Wildlife Monitoring Summary Report (Appendix 47), these management recommendations consist of:

- Scale back road surveys in favour of increased frequency of viewshed surveys.
- Gather detailed information (e.g., sex, age, photos) on deceased animals and include in incident reports, when possible.
- Road surveys should continue to be used along the AWAR and the WTHR, but increasing the frequency of viewshed surveys in 2021 should be a primary objective, particularly during spring migration.
- Variety of specific recommendations regarding the remote camera program.
- More comprehensive blast measurement and response program.
- Maintain a dedicated log of decisions and outcomes of the caribou management decision tree.
- Hunter Harvest Survey – continue on an annual basis, with meetings 3x/yr in 2021.
- Development of a comprehensive raptor nest survey to allow more rigorous analysis of relationships between mine activity and raptor nest success.
- Display posters that show non-native plant species in Nunavut.
- Develop a management plan for non-native plant species if the non-endemic and other non-native species continue to be observed or spread.
- Variety of specific recommendations regarding special studies: snow monitoring program and caribou behavioural studies.

12.4.3 Noise

12.4.3.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

While noise generation was predicted in the FEIS for many minesite components, a significant environmental effect of noise (disturbance of wildlife; reduced habitat effectiveness) requiring monitoring was determined in association with pit development, tailings handling and the mill (Cumberland, 2005; Table B3.2). Monitoring sites were established around the site and along access roads, as described in the current Noise Monitoring and Abatement Plan (V4, December, 2018).

Table 12-11, below, compares FEIS predictions for area sound levels (Cumberland, 2005 – Noise Impact Assessment) with the results of noise surveys (measured sound levels) conducted since 2018 when this

PEAMP evaluation process began. 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 12.4.2.

No exceedances of FEIS predictions occurred in 2020. Although only one impact prediction was exceeded in 2018 & 2019 for one monitoring location, a discussion and historical trend analysis of noise levels for all sites are provided in Section 12.4.3.2.

Table 12-11 Predicted and measured sound levels for the Meadowbank site. *Values estimated from sound level contour plots in Cumberland, 2005 – Noise Impact Assessment. **For the R5 location (all-weather access road station), predictions were made in the FEIS regarding the maximum 1-hr L_{eq} value only. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.4.3.2.

Project Component	Potential Impact	Proposed Monitoring	Monitoring Station	FEIS Predicted Value (dBA)*	Measured Value $L_{eq, 24-h}$ (dBA)		
					2018	2019	2020
Portage Pit	Moderate and high noise levels from blasting, drilling, TSF berm construction and material handling will disturb wildlife and result in reduced habitat effectiveness	Monitor noise levels and behavioral responses of wildlife	R1	58-63	37.2	47.6	35.5
Goose Island Pit					43.4	NL	37.2
Vault Pit			R2	58-63	40.7	36.8	32.0
Borrow Pits					37.5	34.1	-
Tailings Facilities			R3	49-53	38.8	-	34.0
						38.9	39.4
Mine Plant & Facilities			R4	58-63	57.3	-	34.3
					36.7	-	32.1
			R5	All 1 hr L_{eqs} < 57**	All <57	All <57	All <57
					1/22 @ 58	1/32 @ 58	All <57

12.4.3.2 *Parts 3 & 4: Discussion*

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here.

12.4.3.2.1.1 Noise Levels at R5

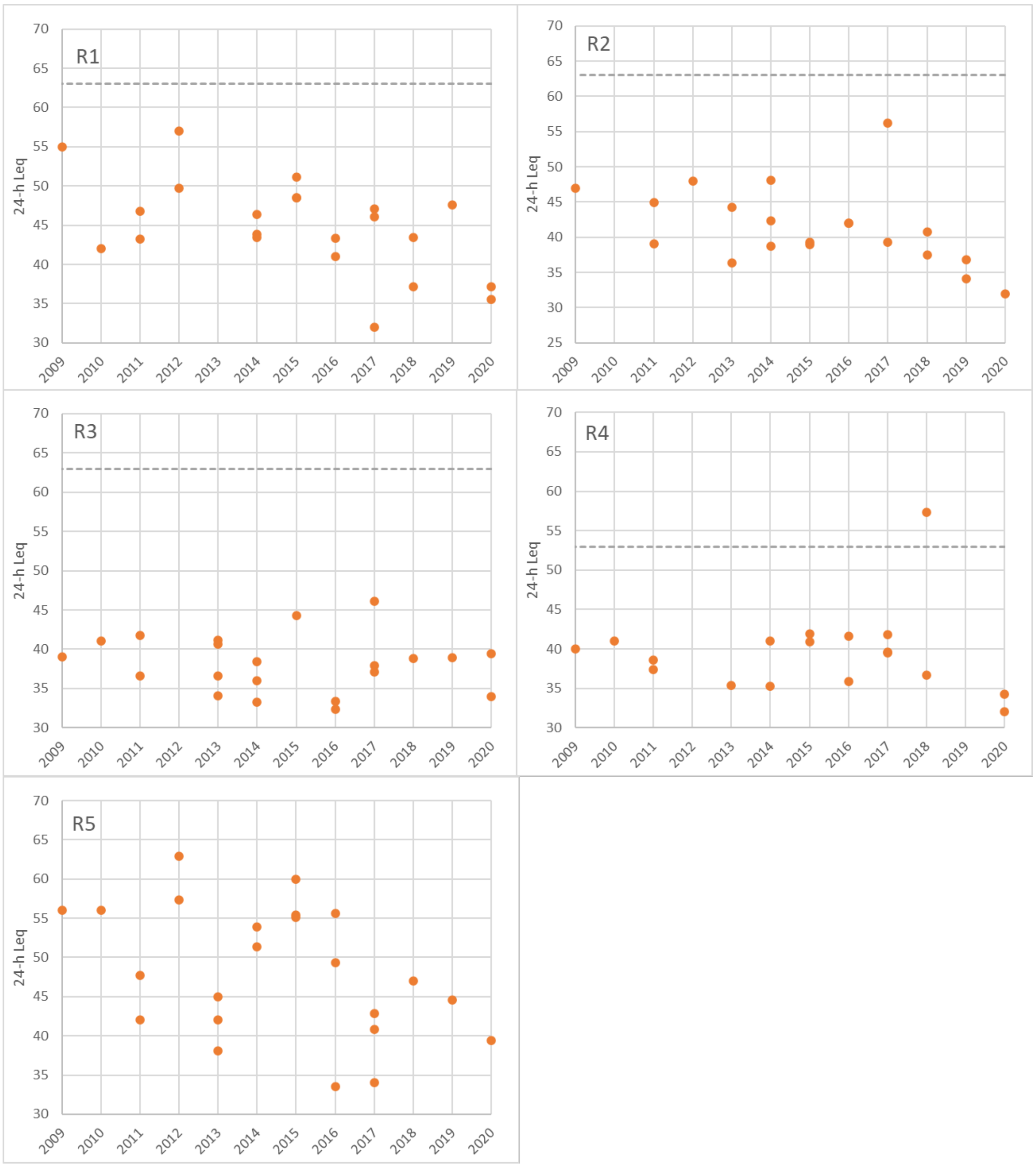
***FEIS Prediction*:** For station R5, FEIS predictions assumed that all one-hour L_{eq} values would not exceed 57 dBA.

***Discussion*:** In 2018 and 2019, this prediction was exceeded for one hour, with an L_{eq} of 58 dBA in both years (4-5pm hour, July 16th, 2018 and 11 am – 12 pm hour, August 8th, 2019). In both cases, the datasets were reviewed, and sound levels were generally well below 57 dBA during the monitoring period (L_{eq} daytime values of 49.5 dBA and 45.8 dBA, respectively). In 2018, two peaks above the predicted hourly L_{eq} value of 57 dBA occurred, lasting a total of 6 minutes. It is possible these were due to animal interference or a helicopter fly-over. Similarly in 2019, review of sound recordings indicated the exceedance occurred due to an aircraft flyover, lasting 2.5 min. Since the exceedances only occurred for single time-points and were not audibly different from the predicted value (<3 dBA difference), the events were not investigated further and no supplemental mitigation was planned. The prediction was not exceeded in 2020.

In the Noise Monitoring Report (Appendix 49), 24-h L_{eq} 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 55). 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 L_{eq} for R5, a decreasing trend is seen for noise levels at this station since 2012.

Complete results of noise monitoring in the current year are provided in Appendix 49.

Figure 55 Historical 24-h L_{eq} values for monitoring stations R1, R2, R3, R4, and R5 at the Meadowbank site. Dashed line indicates the maximum FEIS prediction for each station, if available.



12.4.3.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

Based on the results in Table 12-11, current monitoring programs are able to address all FEIS impacts for which monitoring was recommended (i.e. monitoring is considered effective).

Effectiveness of Mitigation

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 December 2018, and mitigation measures as described in that document were relevant and in practice in 2020.

A summary of the mitigation measures in place to ensure impacts to area noise levels are minimized is provided in Table 12-12, with a commentary on implementation since 2019 when this tracking format began.

Since no consistent exceedances of FEIS predictions has occurred, existing mitigation measures are considered to be effective.

Table 12-12 Mitigation measures described in the Noise Abatement and Monitoring Plan (December, 2018) to reduce impacts of the project on area noise levels, and implementation in 2020

Noise Source	Planned Mitigation Measure (Noise Abatement and Monitoring Plan, December 2018)	Implementation (2020)
Whale Tail Haul Road Construction and Widening	Operate construction equipment within specification and capacity (i.e. don't overload machines)	**NA**
	Adequate equipment maintenance	**NA**
	Avoid operating numerous pneumatic tools at the same time, and spread operation throughout working periods	**NA**
	Avoid prolonged idling	**NA**
	If blasting is required, preference for daytime blasting	**NA**
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)	**Yes –**Maintenance logs
	Enforce speed limits	**Yes –** ongoing
	Use shallow slopes for haul road	**Yes –** ongoing
	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)	**Yes –**SOP and best practices
	Keep road surfaces in good repair to reduce tire noise	**Yes –**Road maintenance
	Avoid prolonged idling	**Yes –**No Idling Policy
	Avoid trucking operation during night time on access road, when possible	**Yes –** 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	**Yes –** ongoing
	Restrict air traffic to daytime hours except for emergencies	**Yes –** ongoing
Impact equipment (pile drivers, jack hammers, drills, pneumatic tools)	Avoid operating numerous pneumatic tools at the same time, and spread operation throughout working periods	**Yes –**Best practices

Noise Source	Planned Mitigation Measure (Noise Abatement and Monitoring Plan, December 2018)	Implementation (2020)
Stationary equipment (compressors, generators, pumps)	Keep equipment in good condition	**Yes –**Preventive maintenance
Blasting	Use delays, both surface and down hole	**Yes –**Blast monitoring plan
	Preference for daytime blasting	**Yes –**Blast monitoring plan
	Blasting in depressed pits (normal production practice)	**Yes –**Blast monitoring plan
Outdoor material handling equipment (crushers, concrete mixers, cranes)	Place crushers in sheltered/enclosed locations if possible	**Completed**
	Maintain equipment in good working condition	**Yes –** ongoing
	Turn equipment off when not in use if practicable	**Yes –** ongoing
Earth moving equipment (trucks, loaders, dozers, scrapers)	Aim to restrict equipment age so only newer, more efficient machinery will operate onsite	**Yes –**Maintenance logs
	Operate equipment within specification and capacity (i.e., don't overload machines)	**Yes –**Maintenance logs
	Use noise abatement accessories such as sound hood and mufflers	**Yes –**Maintenance logs
Primary plant facilities (gyratory primary crusher, SAG mill, ball mill, power plant)	Provide building with walls absorbing noise	Completed
	Maintain equipment on a regular basis, replace worn parts, lubricate as required	**Yes –**Preventive maintenance
	Provide diesel plant units with efficient intakes and exhaust silencers	**Yes –**Preventive maintenance
	Use conveyor system with low noise output, paying particular attention to rollers	**Completed**
	Enclose conveyors where necessary	**Completed**
Utilities and services	Ensure that a rotating biological contactor treatment system operates quietly	**Completed**
	Dump solid waste behind barriers	**N/A**

NA = not applicable

Adaptive Management

Since only minor departures from noise impact predictions have occurred historically, and there are no clear trends towards increasing noise levels around the Meadowbank site, no adaptive management actions are planned in 2021 based on this PEAMP analysis.

12.4.4 Air Quality

12.4.4.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

In order to estimate potential impacts of the Project on air quality, modeling exercises were conducted as a component of the original project FEIS to determine emission rates and dispersion of various criteria air contaminants from different sources (Air Quality Impact Assessment, Cumberland, 2005)[6].

This included modeling emissions of three size fractions of suspended particulates ($PM_{2.5}$, PM_{10} and TSP) originating from the TSF, WRSF, and ore stockpile, for 24h and annual averaging times. Deposition rates

[6] As part of the FEIS for the Whale Tail Project (Agnico Eagle, 2016), qualitative assessments were performed for ongoing use of the Meadowbank mill and AWAR, but no quantitative changes to original FEIS predictions were included.

for dust from these sources were also calculated (g/m^2/30d). While maximum ground level concentrations were described in the FEIS document for all size fractions, contour plots were only provided for TSP and deposition rates (Air Quality Impact Assessment, Cumberland, 2005).

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 was only 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 current Air Quality and Dustfall Monitoring Plan. Carbon monoxide and sulphur dioxide are 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) are not suitable for comparison to field measurements (i.e. monitoring results) since only emissions from three specific point sources were required to be modeled (TSF, WRSF, ore stockpile). For reference, all results for TSP and dustfall monitoring are provided in the 2020 Air Quality and Dustfall Monitoring Report (Appendix 46), along with comparisons to regulatory guidelines and historical measurements.

Even for those measured parameters which are comparable to FEIS predictions here (NO_2, $PM_{2.5}$, PM_{10}), it should still be noted that while field monitoring captures emissions from all mine-related sources, 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 improve the comparison.

The following specific methods were used:

-Modeled values for suspended particulates ($PM_{2.5}$ and PM_{10}) were obtained for the two 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 µg/m^3 for 24-h and annual averaging times, respectively (Whale Tail Pit FEIS, 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 $PM_{2.5}$ and 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.

Table 12-13 summarizes the predicted residual impacts to air quality and results of the FEIS-comparable monitoring conducted in 2018, 2019, and 2020.

Despite the generally conservative nature of these comparisons, no exceedances occurred for NO_2, $PM_{2.5}$, or PM_{10}. GHG emissions are assessed collectively for the Meadowbank and Whale Tail sites (see Section 12.5.4.

Table 12-13 Predicted and measured impacts to air quality for the Meadowbank site. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.3.4.2. Predicted impacts according to the Air Quality Impact Assessment, Cumberland, 2005. *Addition of background values described above in Section 12.3.4.1.

<table>
<tr><th rowspan="2">Project Component</th><th rowspan="2">Potential Impact</th><th rowspan="2">Proposed Monitoring (FEIS)</th><th rowspan="2">Monitoring Conducted</th><th rowspan="2">Max. Predicted Value (FEIS) + Est. Partial Background*</th><th colspan="3">Measured Value</th></tr>
<tr><th>2018</th><th>2019</th><th>2020</th></tr>
<tr><td>Dike construction</td><td>Generation of dust during placement of dike material</td><td>Static dustfall</td><td>N/A (no dikes constructed)</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Dewatering</td><td>Generation of dust from exposed lake sediment</td><td>Static dustfall</td><td rowspan="4">Static dustfall, NO_2 (four locations) and suspended particulates (two locations) under Air Quality Monitoring Plan</td><td rowspan="4">NO_2 (ppb; annual avg.) = 4.97

$PM_{2.5}$ ($\mu g/m^3$; 24 h avg.):
DF-1: 20+6.7 = 26.7
DF-2: 10+6.7 = 16.7

$PM_{2.5}$ ($\mu g/m^3$; annual avg.)
DF-1: 1+3.6 = 4.6
DF-2: 0.5+3.6 = 4.1

PM_{10} ($\mu g/m^3$; 24 h avg.):
DF-1: 20+6.7 = 26.7
DF-2: 40+6.7 = 46.7</td><td rowspan="4">NO_2 (ppb; annual avg.; DF-2) = 1.81

$PM_{2.5}$ ($\mu g/m^3$; 24 h avg.):
DF-1: all < 26.7
DF-2: all < 16.7

$PM_{2.5}$ ($\mu g/m^3$; annual avg.)
DF-1: 0.2
DF-2: 1.4

PM_{10} ($\mu g/m^3$; 24 h avg.):
DF-1: all < 26.7
DF-2: all < 46.7</td><td rowspan="4">NO_2 (ppb; annual avg.; DF-2) = 1.47

$PM_{2.5}$ ($\mu g/m^3$; 24 h avg.):
DF-1: all < 26.7
DF-2: all < 16.7

$PM_{2.5}$ ($\mu g/m^3$; annual avg.)
DF-1: 0.5
DF-2: 1.5

PM_{10} ($\mu g/m^3$; 24 h avg.):
DF-1: all < 26.7
DF-2: all < 46.7</td><td rowspan="4">NO_2 (ppb; annual avg.; DF-2) = 0.77

$PM_{2.5}$ ($\mu g/m^3$; 24 h avg.):
DF-1: all < 26.7
DF-2: all < 16.7

$PM_{2.5}$ ($\mu g/m^3$; annual avg.)
DF-1: 0.6
DF-2: 1.9

PM_{10} ($\mu g/m^3$; 24 h avg.):
DF-1: 1 of 52 samples > 26.7
DF-2: all < 46.7</td></tr>
<tr><td>Pits</td><td>Generation of dust and gases from blasting, excavation etc.</td><td>Static dustfall</td></tr>
<tr><td>Waste Rock Facility and Tailings Storage Facility</td><td>Generation of dust from material deposited on waste rock pile or tailings</td><td>Static dustfall</td></tr>
<tr><td>Onsite Roads and Traffic, Airstrip</td><td>Generation of dust and emissions from use of roads and airstrip</td><td>Static dustfall</td></tr>
<tr><td>Mine Plant and Facilities</td><td>Release of pollutants from incineration</td><td>Report emissions</td><td>GHG emissions reported</td><td>Updated for Whale Tail Project – see Section 12.5.4</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>All Weather Access Road</td><td>Generation of dust and emissions from frequent activity by service and vehicles accessing staging facility</td><td>Static dustfall</td><td>Static dustfall (52 locations)</td><td>< Vault Haul Road</td><td>-</td><td colspan="2">< Vault Haul Road; See discussion, Section 12.4.4.2</td></tr>
</table>

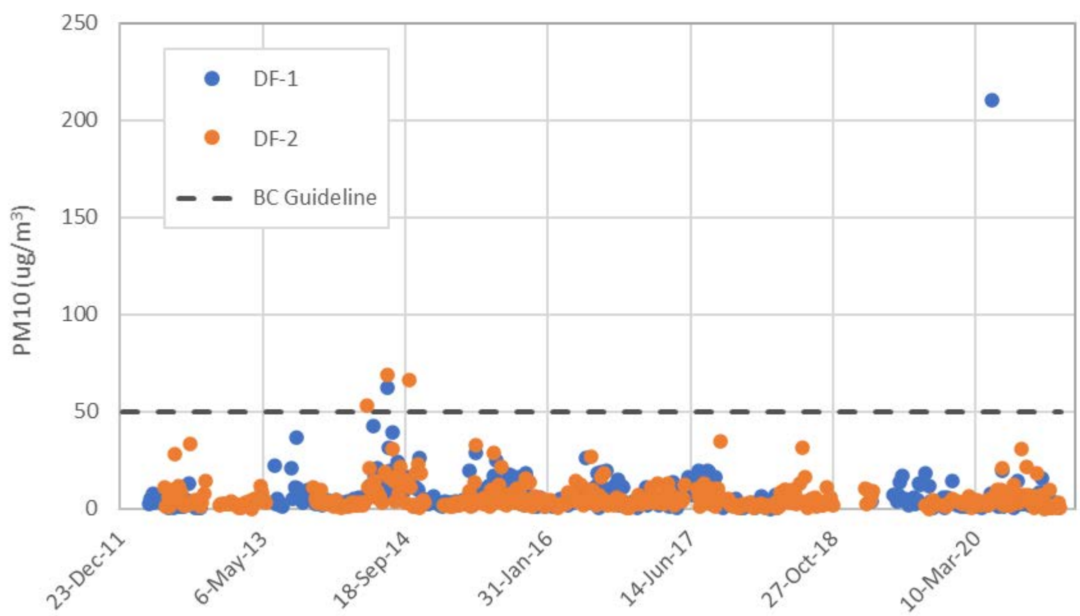
12.4.4.2 *Parts 3 & 4: Discussion*

If air quality impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here. Where quantitative comparisons to field monitoring results were feasible, no regular exceedances of air quality impact predictions occurred in 2018, 2019, or 2020. However the isolated single exceedance for PM_{10} is discussed below, along with the comparison of Vault Haul Road and AWAR dustfall results.

12.4.4.2.1 PM_{10}

In 2020, one of 52 PM_{10} samples exceeded the prediction. However, the bulk of results indicate this was an isolated event, and no trends towards increasing air quality concerns are evident (Figure 56).

Figure 56. 24-h average concentration of airborne particulate matter less than 10 microns (PM10) at Meadowbank stations DF-1, DF-2, and DF-6b. Dashed line indicates the BC Air Quality Objective for this parameter.



12.4.4.2.2 AWAR Dustfall

In their 2018-2019 Annual Monitoring Report for the Meadowbank Gold Project and the Whale Tail Pit Project, the NIRB requested a discussion of whether the predictions in the Final Environmental Impact Statement may have potentially underestimated the amount of dust produced on the mine site including along the all weather access road (AWAR). In the 2019 Annual Report, Agnico provided this review of FEIS modelling, and supplemental comparisons of dustfall results. While the full discussion is not re-visited here, the comparison of Vault Haul Road dustfall and AWAR dustfall is carried forward along with 2020 results.

Within the FEIS, air quality modeling was completed for the Vault Haul Road. That modeling indicated that the worst case level of air pollution (mainly due to fugitive dust) would be in the range of, or less than, air quality objectives. Since traffic rates along the AWAR were predicted to be lower than the Vault Haul Road, air quality modeling was not specifically conducted for the AWAR - i.e., impacts of the AWAR on air quality were assumed to be lower than impacts of the Vault Haul Road.

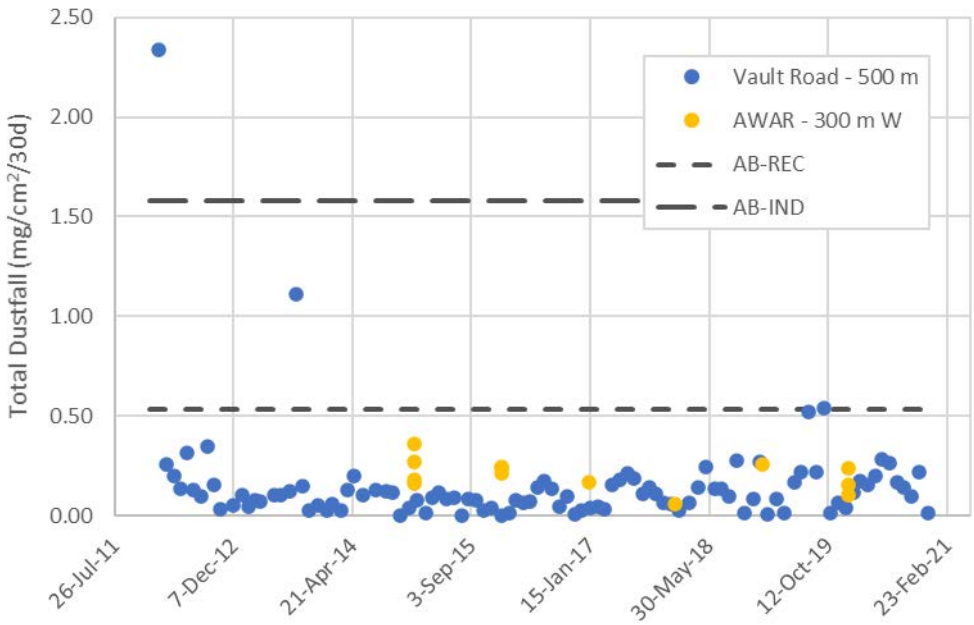
To validate this assumption of the FEIS, dustfall monitoring results from the Vault Haul Road area were compared with those collected along the AWAR, to determine whether air quality impacts (as measured through this FEIS-recommended monitoring method) are similar.

Dustfall results for DF-4 (500 m west of the Vault Haul Road) and comparable locations with respect to the AWAR (km 18 and 78; 300 m west of the road) are provided in Figure 57. The following differences in sample collection methods are kept in mind while interpreting this data:

- Samples collected along the Vault Haul Road are collected on a 2 m stand (ASTM method), while those collected historically (prior to 2020) along the AWAR are at ground level, due to logistical constraints. As described in the 2019 Air Quality and Dustfall Monitoring Report, results for ground level samples have always been higher than results for associated samples at 2-m height.
- Samples collected along the Vault Haul Road are at a distance of approximately 500 m from the road, while those used in this comparison for the AWAR are at a distance of 300 m. No samples have been collected at 500 m from the AWAR, and results at 300 m are expected to provide a conservatively high comparison.
- Results for the AWAR are only available for the summer season, when higher traffic rates and dry road conditions prevail. Results used in historical comparisons are from the August sampling event only. These results can therefore be considered peak values, and averages based on these are likely inflated compared to the true annual average (as calculated for the Vault Haul Road dataset).
- AWAR samples provided here are collected in locations where dust suppression is not applied, whereas the Vault Haul Road is watered near-continuously in the snow-free season.

Despite these differences which generally result in a very conservative comparison of dustfall rates between the Vault Haul Road location and AWAR samples, dustfall rates in both locations are historically similar. While the AWAR dataset for this purpose is limited, these results suggests that the FEIS assumption of lower air quality impacts along the AWAR as compared to the Vault Haul Road were accurate.

Figure 57 30-d rates of total dustfall measured at monitoring station DF-4 (500 m west of the Vault Haul Road) and along the AWAR (km 18, 78; 300 m west). Alberta Environment dustfall guidelines for recreational areas (AB-Rec) and industrial areas (AB-Ind) are shown.



12.4.4.3 *Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

As described in Section 12.4.4.1, only a subset of FEIS air quality predictions are readily comparable to monitoring results. However, air quality monitoring at the Meadowbank site is well suited to understanding ambient air quality at the site in relation to regulatory criteria, and is therefore considered effective as designed in plans approved at the FEIS stage of the Project. A complete analysis of air quality monitoring results in comparison to regulatory criteria is provided in the 2020 Air Quality and Dustfall Monitoring Report (Appendix 46).

Effectiveness of Mitigation

A summary of the planned mitigation measures for air quality (per Air Quality and Noise Management Plan, 2005) is provided in Table 12-14, along with a commentary on current implementation.

Table 12-14 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 (2020)
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 applied 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 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	Blasting follow the approved Blast Monitoring Program
	Cover dewatered tailings with non-potentially acid-generating (non-PAG) aggregates to control wind erosion	Progressive reclamation of the North Cell Tailings Pond was started in previous years but no cover added in 2020
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

Emission Source	Planned Mitigation Measure (Air Quality and Noise Management Plan, 2005)	Implementation (2020)
	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.
	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.

Adaptive Management

Since no exceedances of impact predictions occurred, no adaptive management actions or supplemental monitoring programs are planned for 2021 based on this PEAMP analysis.

12.4.5 Permafrost

12.4.5.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

A summary of predicted residual impacts to permafrost (after mitigation), as described in the FEIS (Cumberland, 2005; Table B1.2), and results of monitoring being conducted to assess the accuracy of these predictions is provided in Table 12-13 below. A complete description of monitoring results is provided in the 2020 Geotechnical Inspection Report (Appendix 9), which reviewed instrument data collected between September 2019 and July 2020.

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. Therefore, 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 12-15 Predicted and measured impacts to permafrost for the Meadowbank site. Predicted impacts according to Cumberland, 2005, Table B1.2. Measured impacts according to the 2020 Geotechnical Inspection Report (Appendix 9)

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted	Predicted Impact in FEIS	Measured Impacts		
					2018	2019	2020
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		East Dike, Bay-Goose Dike, South Camp Dike: similar to historical trends, partially frozen foundations with cooling trends at edges of seepage zones. Vault Dike: frozen foundation Central Dike: similar to historical trends, partially frozen foundation SD1&2, 4&5: frozen foundations; SD3: 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.	Thermistors indicate tailings are not completely frozen. Freezeback and progression of freezing front is occurring in the North Cell in section not entirely frozen. Data are showing quicker freezeback than anticipated	
Permafrost changes in Third Portage Lake (TPL) north central shoreline and Portage Pit area	Portage pit development	Assessment of suspected ground ice development in conjunction with permafrost aggradation. Assessment of ground ice content of select shoreline polygons.	None	Net increase in permafrost distribution and/or decrease in ground temperatures	General increase in permafrost aggradation due to structures; permafrost is developed in part of the Portage Pit and Goose Pit walls, under the Goose Dike.		
Permafrost	Construction	Internal and	Thermistor	Fall, winter and spring	Frozen ground	Frozen ground conditions under the Portage	

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted	Predicted Impact in FEIS	Measured Impacts		
					2018	2019	2020
changes in waste rock area	of waste rock facility	foundation temperatures to be monitored	monitoring of internal and foundation temperatures	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.	conditions under the Portage RSF for all thermistor locations. Rockfill temperature below 0 °C for at least 10m above ground surface for all instruments.	RSF for all thermistor locations. Rockfill temperature below 0 °C for at least 10m above ground surface for all instruments. Decreasing trends in active zone depth are recorded at most thermistor locations. Temperature trends in the structure are becoming more consistent with predicted temperature over time.	
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 pipelines	Stabilization of permafrost temperature and active layer thickness	Monitor pipeline alignment for potential permafrost degradation	None	Minor any undifferentiated net gain or loss of permafrost	No ground temperature measurements but no observations of thawing due to pipelines.		

12.4.5.2 *Parts 3 & 4: Discussion*

Permafrost conditions continue to be monitored, but since final impact predictions relate to the closure/post-closure phase, no commentary on potential exceedances is made at this time.

Nevertheless, to help demonstrate the current status towards achieving these predictions, historical trends for all thermal monitoring results are provided in Appendix 25 of the 2020 Annual Report.

12.4.5.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

Based on Table 12-13, all FEIS predictions for which monitoring was recommended are being addressed through current programs. Monitoring is therefore considered effective.

Effectiveness of Mitigation

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 2019 is provided in Table 12-16. 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 12-16 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	
		2019	2020
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 and elevated (freshwater line)	
Discharge facilities & pipeline	Use insulated pipe with heat tracing; elevate pipeline across thaw sensitive terrain	Insulated pipe 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 yet required	

Adaptive Management

No changes to permafrost monitoring or management programs are planned in 2021.

12.4.6 Socio-Economic

A comprehensive assessment of socio-economic indicators, comparison to FEIS predictions, and review of management/mitigation measures is provided in the 2020 Socio-Economic Monitoring Report (Appendix 52) and summarized here in the PEAMP format. Since, in many cases, is it not possible to distinguish impacts of the Meadowbank project from those of the Whale Tail project, the PEAMP evaluation is combined for this sector.

12.4.6.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

Based on results of the 2020 Socio-Economic Monitoring Report (SEMR), the accuracy of Project impacts as predicted in the FEIS documents (Cumberland, 2005 - Table B15.2; Golder, 2018) is assessed for each identified valued socio-economic component in Table 12-17, below. For each metric assessed, 2020 results are presented along with the overall trend since the Project construction phase. When specific impact predictions are not being met, further discussion is provided in Section 12.4.6.2.

As described in the 2020 SEMR, COVID-19 has been a major factor in movement of a number of indicators for 2020.

Table 12-17 Summary of FEIS predictions for VSECs, observed trends, and interpretation of monitoring results in comparison to FEIS predictions (Cumberland, 2006; Golder, 2018). Measured impacts that are trending in a negative manner outside of predictions are further discussed in Section 12.4.6.2. Plus symbol (+) indicates a result that is measured outside of impact predictions in a manner that is considered positive – these results are not discussed further here, but explained in detail in the corresponding section of the 2020 SEMR.

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
1. Employment	1.1 Total project employment (Agnico Eagle & contractors)						
MEADOWBANK: "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, p. 120) WHALE TAIL: "The Expansion Project will create direct, indirect and induced employment opportunities." (Golder Associates, 2018, p. 9)	Project employment (permanent & temporary, on-call, students & co-op & contractor)	N/A	↑	↑	Employment at Meadowbank / Whale Tail grew by 10% overall in 2020 to 1,717, with both Agnico Eagle and contractor employees increasing from 2018. Contractors account for 43% of Meadowbank / Whale Tail employment.	MEADOWBANK "It is expected that the construction phase workforce will average 160 and peak at 310, and the operation phase workforce is estimated at 370." (Cumberland Resources, 2006, p. 119) WHALE TAIL "Direct average operational employment is expected to be 1,166 positions." (Golder Associates, 2018, p. 9)	MEADOWBANK – Prediction exceeded (+) WHALE TAIL – Prediction supported or exceeded
	1.2 Project Inuit employment (Agnico Eagle and contractors)						
	Project Agnico Eagle employment (Inuit & non-Inuit)				Across both projects in 2020, Agnico Eagle and contractors employed a total of 378 Inuit FTEs, constituting 13% of FTEs and a decrease from 18% in 2019. At Meadowbank / Whale Tail there were 260 Inuit FTEs, or 15% of the workforce, down from 20% in 2019.	MEADOWBANK – none WHALE TAIL (inc. contractors) 25% of direct construction positions will be sourced locally, and are expected to be filled by the existing Meadowbank Mine workforce (Golder Associates, 2016, pp. 7-51) Operational employment is expected to be 931 positions… of these nearly half (392 or 42%) are expected to be filled by Nunavummiut (Golder Associates, 2016, pp. 7-52) "The Expansion Project serves to extend employment opportunities for the Approved Project workforce, and adds a projected 99 opportunities for Nunavummiut" (Golder Associates, 2018, p. 19)	MEADOWBANK – N/A **WHALE TAIL - Predictions not supported (see Discussion, Section 12.4.6.2.1)**
	Inuit FTEs	N/A	→	↓			
	Inuit FTE rate	N/A	→	↓			
	Project contractor employment (Inuit & non-Inuit)						
	Inuit employees / FTEs	N/A	→	↓			
	Inuit employee / FTE rate	N/A	↓	↓			
	1.3 Project Agnico Eagle employment by Kivalliq community						

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends Pre-dev	Post-dev	Last year	2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
	Project employment by Kivalliq community	N/A	↑	↓	The number of Kivalliq-based employees shrunk to 299 at Meadowbank / Whale Tail, an 8% decline from 2019, counter to the trend from 2016 through 2019. In 2020, over half (57%) of Meadowbank / Whale Tail's Kivalliq based employees were from Baker Lake.	MEADOWBANK – none WHALE TAIL The FEIS estimates 217 positions will be filled by employees from Baker Lake. (Golder Associates, 2016, pp. 7-53)	MEADOWBANK – N/A **WHALE TAIL - Prediction not supported. See discussion, Section 12.4.6.2.2.**
	1.4 Project turnover						
	Agnico Eagle Inuit employee turnover by reason	N/A	N/A	N/A	Inuit turnover rates at Meadowbank / Whale Tail decreased in 2020 to 17% from 39% in 2019, and at Meliadine decreased in 2020 to 9% from 28% in 2019, potentially due to the ability to retain pay while returning home in response to COVID-19 restrictions. The turnover rate for Inuit employees at all Agnico Eagle projects is consistently higher than that for non-Inuit employees. Resignations and dismissals account for the majority of Inuit turnover across the sites.	MEADOWBANK – none WHALE TAIL - none	N/A
	Turnover rates						
	Inuit rates	N/A	→	↓			
	Non-Inuit rates	N/A	→	↓			
	Turnover rate by community	N/A	→	↓			
2.Income	2.1 Income paid to projects' Inuit employees						

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
MEADOWBANK: "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) WHALE TAIL: "The Expansion Project will generate direct, indirect and induced incomes." (Golder Associates, 2018, p. 12)	Income paid to Agnico Eagle project Inuit employees	N/A	↑	↓	Total income paid to both project's Inuit employees (excluding contractors) in 2020 was $26.8M, a 20% decrease from 2019 but explained partly by COVID-19 restrictions which sent Inuit employees home with 75% of their pay over much of 2020. Inuit income at Meadowbank / Whale Tail declined by 27% in 2020 compared to 2019.	MEADOWBANK "Direct project wages paid to people in Kivalliq Region, primarily Baker Lake, could exceed $4 M annually" WHALE TAIL "During operations, the Expansion Project is projected to generate $421.1 million (cumulatively) in direct labour income in Nunavut, and $509.3 million in total territorial labour income." (Golder Associates, 2018, p. 12)	MEADOWBANK - Prediction exceeded (+) WHALE TAIL - TBD
	2.2 Income by Kivalliq community						
	Median employment income of tax filers by Kivalliq community	→	↑	N/A	Median income in Baker Lake and Rankin Inlet have had the highest median incomes in the Kivalliq region during several years since Meadowbank opened except for 2017 (the latest year for which data is available) when Chesterfield Inlet surpassed Baker Lake. Each of Rankin Inlet, Baker Lake, and Chesterfield Inlet have experienced rises in median income over the lives of the Agnico Eagle mines. Growth in median employment income has been most positive among communities with the highest levels of Agnico Eagle employment.	MEADOWBANK The Meadowbank FEIS makes no specific predictions regarding changes in the median income of Kivalliq communities but does predict that Baker Lake will experience the most positive effects of increased income. WHALE TAIL - none	MEADOWBANK - Prediction supported WHALE TAIL – N/A
3. Contracting and Business Opportunities	3.1 Contract expenditures						

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
MEADOWBANK: "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) WHALE TAIL: The Project will generate "continued local economic activity" (Golder Associates, 2016, p. 68) and is expected to have "high positive impacts…" (Golder Associates, 2016, p. 68) on local procurement.	Contract expenditures on NTI-registered businesses				Agnico Eagle spending with Inuit businesses increased 26% in 2020 to $630M, and spending on Inuit businesses as a percentage of total spend rose to 69%. The proportion of expenditures going to Inuit businesses has almost continually risen over the last decade. Meadowbank / Whale Tail spending at NTI registered businesses increased in 2020 to $360M. The proportion of total spend increased to 74% (from 64%).	MEADOWBANK "With continuing preferential contracting, local business participation in the project is expected to grow with time." (Cumberland Resources Ltd., 2006, p. 7) WHALE TAIL "…about $271 million procured from Nunavut-registered companies. Of this, roughly 84% ($223 million) will be through Kivalliq-registered businesses…[of which]…67% is expected to accrue to those in Rankin Inlet, with 32% accruing to those in Baker Lake." (Golder Associates, 2018, p. 19)	MEADOWBANK - Prediction supported WHALE TAIL - Prediction supported
	NTI expenditures	N/A	↑	↑			
	Proportion NTI	N/A	↑	↑			
	NTI-registered business expenditures by Nunavut community	N/A	→	↑	Expenditures at NTI-registered businesses within Baker Lake increased in 2020 to $38M, up from $30M in 2019. Expenditures in Rankin Inlet increased in 2020 to $351M from $295M in 2019. The amount spent in non-Kivalliq Inuit communities increased in 2020 to $207M from $170M in 2019, but was slight lower than spent in 2018 ($208M).		
	Contract expenditure on Nunavut-based businesses				Meadowbank / Whale Tail contract expenditures on Nunavut-based businesses (including NTI-registered businesses) increased to $376M in 2020 from $323M in 2019. Meadowbank / Whale Tail		
	Nunavut-based expenditures	N/A	↑	↑			
	Proportion Nunavut-based	N/A	↑	↓			

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
	Contract expenditures from Meadowbank/Whale Tail on Baker Lake-based businesses	N/A	↓	↑			
4. Education and Training	4.1 Investment in education-based initiatives						
MEADOWBANK: "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) WHALE TAIL: "The Project will provide training opportunities for its workforce… The project will contribute to community education" (Golder Associates, 2016, pp. 3-C-38)	Agnico Eagle investments in education-based initiatives	N/A	/	↓	In 2020, Agnico Eagle made $220,000 in contributions to education-based initiatives, with investments since the beginning of operations totalling over $2.6 million.	MEADOWBANK "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 would be intended to contribute to encouraging a commitment to education on the part of youth." (Cumberland Resources Ltd., 2006, p. 121) WHALE TAIL "The Project will provide workforce training and support community education" (Golder Associates, 2016, pp. 7-55)	MEADOWBANK - Prediction supported WHALE TAIL - Prediction supported
	4.2 Secondary school graduation by region						
	Secondary school graduation rate by region	↑	↑	↑	The overall upward trend in graduation rates continued in 2020. Rates have been at all-time highs for the Kivalliq region, and consistently higher than those in the other two regions of Nunavut, since 2010.	MEADOWBANK – none WHALE TAIL - none	N/A
	4.3 Project training and education						
	Agnico Eagle investments in mine training and education programs	N/A	→	→	Agnico Eagle's financial investments in externally delivered training programs have dropped substantially since 2016; internal spending has increased accordingly to maintain a	MEADOWBANK "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.,	MEADOWABNK - Prediction supported WHALE TAIL - Prediction supported
	Average mandatory training hours provided to Agnico Eagle Inuit	N/A	→	↓			

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
	employees				minimum of $3.6M in training spending as per the IIBA with the KIA. Mandatory training hours for Inuit at Meadowbank/Whale Tail declined in 2020 to 2 hours/FTE from 20 hours/FTE in 2019, and at Meliadine from 30 hours/FTE in 2019 to 4 in 2020. Average specific training hours for Inuit decreased at Meadowbank /Whale Tail to 23 hours/FTE in 2020 from 56 2019 and decreased at Meliadine to 58 in 2020 from 161 in 2019. This large decline was largely due to the Nunavummiut workforce being sent home early in March due to COVID-19. Participants and graduates in career and skills programs were lower in 2020, at a total of 24, compared to 30 in 2019. There were ten active Inuit apprentices across Agnico Eagle projects in 2020, the same number as in 2019 but down from a peak of 18 in 2018.	2006, p. 121) WHALE TAIL "The Project will continue the workforce training programs in place at Meadowbank Mine" (Golder Associates, 2016, pp. 7-55)	
	Average specific training hours provided to Agnico Eagle Inuit employees	N/A	→	↓			
	Participation in career and skills programs	N/A	↓	↓			
	Pre-apprenticeship and apprenticeship participation by type	N/A	↓	→			
	4.4 Project employment by skill level						
	Project Agnico Eagle Inuit employees by skill-level	N/A	↑	↑	In 2020 there were 14 Inuit employees working at Agnico Eagle projects in positions classified as 'skilled' or 'management and professional',	MEADOWBANK - none WHALE TAIL "As Nunavummiut employees achieve further training and education, it is expected that they	MEADOWBANK – N/A **WHALE TAIL - Limited success - further discussion is provided in**

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends Pre-dev	MBK / WT Trends Post-dev	MBK / WT Trends Last year	2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
					unchanged from 2019. The majority of these positions (10 of the 14, or 71%) were at Meliadine. The number of skilled workers at both projects peaked at 10 in 2018 and has since fallen to 7 in 2020. Meadowbank and Whale Tail have struggled to increase the number of skilled Inuit, with the highest number being 6 in 2017 and with only 3 in 2020. The number of semi-skilled Inuit employed has generally increased over time, though there was a 3% decrease in 2020 to 215.	will be better poised to advance to more skilled positions as they arise, thereby increasing representation of Nunavut residents in the skilled, professional and management employment categories” (Golder Associates, 2016, pp. 7-55)	**Section 12.4.6.2.3**
5. Culture and Traditional Lifestyle	5.1 Perceptions of culture and traditional lifestyle						
MEADOWBANK: “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)	Self-reported effect of project on culture and traditional activities	N/A	N/A	/	A survey of Inuit employees was conducted in 2019; no follow-up survey was conducted in 2020. As reported in the 2019 survey, a large majority of survey respondents strongly agree (59%) or somewhat agree (21%) that knowledge and respect of Nunavut’s environment and land is valued by Agnico Eagle. When asked about the impact of the mine on their ability to participate in cultural and traditional activities, 10% said they	MEADOWBANK – none WHALE TAIL - none	N/A

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
WHALE TAIL: “Project activities may affect continued opportunities for traditional wildlife harvesting… fishing…plant harvesting…the use of culturally important sites… [and it may] change access to traditional use area.” (Golder Associates, 2016, pp. 3-C-33-37)					participated more, 34% felt they participated the same amount, 31% indicated their participation had decreased.		
	5.2 Culture and traditional lifestyle						
	Proportion of total population identifying Inuktitut as their mother tongue by community	→	↓	N/A	The last national survey was conducted in 2016, and no new data is available for reporting. As indicated in the previous year’s monitoring report, 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.	MEADOWBANK “The project will not significantly restrict access to or productivity of lands used for traditional activity.” (Cumberland Resources Ltd., 2006, p. 122) WHALE TAIL “Project activities may affect continued opportunities for traditional wildlife harvesting… fishing…plant harvesting…the use of culturally important sites… [and it may] change access to traditional use areas” (Golder Associates, 2016, pp. p. 3-C-33-37)	MEADOWBANK Prediction supported WHALE TAIL: TBD (cannot be determined at this time)
	Use of AWAR by community	N/A	↑	↑	There was an increase in usage of the Meadowbank AWAR in 2020 to 2,223 times from 2,134 times in 2019.		
	5.3 Country food use at project						
	Country food kitchen usage	N/A	→	↓	Agnico Eagle offers a variety of services to support use of country food at their projects, including country food nights, country food events, and a country food kitchen for use by Inuit employees. The number of country food events grew over the 2017 to 2019 period but dropped in 2020 due to	MEADOWBANK – none WHALE TAIL - none	N/A
	Country food night events	N/A	/	↓			

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
					COVID-19.		
6. Population Demographics	6.1 Employee migration						
MEADOWBANK: "The potential impacts of 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) WHALE TAIL: "Expansion Project employment opportunities could spur migration to Baker Lake and Rankin Inlet… dependant [sic] on scale of speculative migration." (Golder Associates, 2018, p. 18)	Project Agnico Eagle Inuit employees residing outside Nunavut				At Meadowbank / Whale Tail, the number of Inuit employees residing outside Nunavut has remained stable since 2015, currently at 21 in 2020, which accounts for 7% of the Inuit workforce	MEADOWBANK The Meadowbank FEIS suggests that in-migration of Southerners to Baker Lake would be the primary concern. WHALE TAIL "Project is not expected to generate employment-driven migration." (Golder Associates, 2016, 3-C-38)	MEADOWBANK: Prediction is not supported (+) WHALE TAIL: Prediction supported
	Total Inuit employees	N/A	→	→			
	Proportion of Inuit to non-Inuit employees	N/A	→	→			
	6.2 Population estimates in Kivalliq communities						
	Population estimates of				In 2020, the average annual percent change in population across Kivalliq communities was 1.1%, down slightly from 1.6% in 2019, but consistent with rates since the early 2000s. Based on available and current data, there is no indication of mining induced in-migration.	MEADOWBANK "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. WHALE TAIL "No Project employment-driven migration or population change is anticipated." (Golder Associates, 2016, 3-C-38)	MEADOWBANK: N/A WHALE TAIL: Prediction supported
	Estimates in communities	↑	↑	→			
	Annual percent change	→	→	↓			
7. Individual and Community Wellness	7.1 Agnico Eagle's Programs						
MEADOWBANK: 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	Agnico Eagle wellness programs offerings & utilization by project employees	N/A	N/A	N/A	Agnico Eagle continues to offer a variety of wellness programs to both employees and community members. Where data can be and are collected, all programs have seen some usage by their intended audience.	MEADOWBANK - none WHALE TAIL "The Project will continue existing individual and family wellness programming (e.g., Employee Family Assistance Program)." (Golder Associates, 2016, p. 3-C-38)	MEADOWBANK: N/A WHALE TAIL: Prediction supported
	Agnico Eagle wellness programs offerings & utilization by community members	N/A	N/A	N/A			
	7.2 Perceptions of health & wellness						

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
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) WHALE TAIL: "Project incomes may adversely affect family and community cohesion through social ills (e.g., substance abuse, sexual misconduct, family violence, crime);" Incomes may also "exacerbate income inequality, social disparity, and, potentially, related conflict in families and crime in communities."	Self-reported effect of project on health & wellness	N/A	N/A	/	At least 80% of Inuit employee survey respondents believe Agnico Eagle has created a positive work environment driven by respect, indicate they are happy at work, and say they have shared positive work values with youth at home or in the community. There do not appear to be significant systemic impacts on relationships related to working at Agnico Eagle (based on survey responses), as nearly half reported no change, and an equal and smaller number reported either a positive or negative impact. Inuit employee survey respondents worry the most about family and financial situations, and some struggle with loneliness; work-related difficulties impact fewer than 25%. Nearly 60% of Inuit survey respondents reported that they did not save any money over the last year, and two thirds of survey respondents reported that they did not seek or receive financial advice in the past year.	MEADOWBANK – none WHALE TAIL - none	N/A
(Golder Associates, 2016,	7.3 Criminal violations						
3-C-38). "Project rotational	Criminal violations per hundred people by Kivalliq community	/	/	/	By 2018, the latest year for which data are available, crime	MEADOWBANK – none	MEADOWBANK: N/A WHALE TAIL: TBD (cannot be

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends Pre-dev	MBK / WT Trends Post-dev	MBK / WT Trends Last year	2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
employment may adversely affect family and community cohesion related to extended time away from family and community." (Golder Associates, 2016, 3-C-38) "Expansion Project induced inmigration could increase demand for housing in Baker Lake and Rankin Inlet… dependant on scale of speculative migration." (Golder Associates, 2018, p. 18)	Criminal violations per hundred people by type (Baker Lake, Rankin Inlet, Chesterfield Inlet)				rates across the Kivalliq region averaged 25.1 violations per 100 people, a rate higher than even 2011 when Baker Lake and Rankin Inlet were having historical spikes in rates. Each of Arviat, Baker Lake and Rankin Inlet exhibit a "U-shape" in their curves between highs around 2010 to 2012, lows in the mid-2010s, and then a resumption in higher rates by the late 2010s.These patterns roughly coincide with Agnico Eagle mine construction.	WHALE TAIL "Project incomes may exacerbate …crime in communities." (Golder Associates, 2016, p. 3-C-38)	determined at this time)
	Baker Lake	→	/	↑			
	Rankin Inlet	→	/	↑			
	Chesterfield Inlet	↑	/	↓			
	7.4 Health centre visits						
	Health centre/clinic visits by Kivalliq community by reason for visit	↓	↑	N/A	No new data in 2020. Changes in the number of individual visits to health centres by reason for the visit can provide some indication of individual and community wellness. From 2009 to 2016, the number of health centre visits increased for a number of different types of services, including for: mental health and behavioural disorders (240% increase), signs of symptoms of illness (cause unknown; 76% increase), musculoskeletal system diseases (60% increase), and injuries and poisonings (39% increase). A number of factors may be contributing to these changes, including but not limited to: increased needs	MEADOWBANK "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) WHALE TAIL "Project-induced migration can increase demand for social and healthcare services…[but] no Project employment-driven migration or population change is anticipated." (Golder Associates, 2016, pp. 3-C-39)	**MEADOWBANK: Impact of Agnico operations cannot be determined – (see Discussion, Section 12.3.6.2.3 of the 2019 PEAMP – no new data in 2020)** WHALE TAIL: TBD (cannot be determined at this time due to lack of employment-driven migration)

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends Pre-dev	MBK / WT Trends Post-dev	MBK / WT Trends Last year	2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
					for medical care due to changes in community health, increased capacity of health centres (size, services), greater awareness of available health services, and willingness to seek help.		
	7.5 Housing						
	Persons on waitlist for public housing by community	/	/	/	While there is potential for mining projects to impact housing supply and demand, (e.g. through changes in income, increased in and out migration, private investment) there is not enough data to draw conclusions on impacts to housing in the territory.	MEADOWBANK – none WHALE TAIL "Project-induced migration can increase demand for housing and associated crowding...[but] no Project employment-driven migration or population change is anticipated" (Golder Associates, 2016, pp. 3-C-39)	MEADOWBANK: N/A WHALE TAIL: Prediction supported – no project impact on housing.
	7.6 Food security						
	Food security by region or community	N/A	N/A	N/A	While there is no available year-over-year data on food security in Kivalliq communities, Agnico Eagle projects offer potential pathways that may positively impact food security in the Kivalliq. This includes providing employees with healthy food choices while on site; increasing household incomes, allowing for greater food purchasing; and enhancing availability and accessibility of country food. However, 59% of Inuit survey respondents reported that they were worried their food would run out before they got more money all, most or some of the time, and only	MEADOWBANK – none WHALE TAIL "Project incomes may enhance individual and community wellness by providing access to… nutritious food." (Golder Associates, 2016, p. 3-C-38)	MEADOWBANK: N/A WHALE TAIL: TBD (cannot be determined at this time)

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
					22% never worried about running out of food.		
	7.7 Suicide						
	Suicides per 10,000 people by region	/	→	/	The factors contributing to suicide are numerous and complex, so it is difficult to assess impacts of Agnico Eagle's projects on suicide rates. Community suicide rates (e.g., for Baker Lake) are highly variable from year to year, but there is a persistent and territory-wide suicide crisis in Nunavut.	MEADOWBANK – none WHALE TAIL - none	N/A
8. Health and Safety	8.1 Health and safety training						
MEADOWBANK: The FEIS considers both the 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) WHALE TAIL: "The Expansion Project may improve worker and public health and	Average (per FTE) mandatory training hours provided to Agnico Eagle Inuit employees	N/A	→	↓	In general, the level training of Inuit employees has been rising over time. However, mandatory training hours at Meadowbank / Whale Tail and Meliadine declined in 2020, largely due to the Nunavummiut workforce being sent home due to COVID-19.	MEADOWBANK – none WHALE TAIL "The Expansion Project may improve worker and public health and safety." (Golder Associates, 2018, p. 13)	MEADOWBANK: N/A WHALE TAIL: N/A - Prediction cannot be assessed through this metric.
	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	↑	↑	Since they have been offered, approximately 80% of visits to Agnico Eagle clinics, at both Meadowbank / Whale Tail and Meliadine, have been for non-work-related conditions, indicating that these clinics serve an important function in addressing the general health needs of workers. Clinic visits at Meadowbank / Whale Tail and Meliadine rose	MEADOWBANK – none WHALE TAIL "The Expansion Project has the potential to result in accidents and emergencies." (Golder Associates, 2018, p. 13)	MEADOWBANK – N/A WHALE TAIL - Prediction supported

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends Pre-dev	MBK / WT Trends Post-dev	MBK / WT Trends Last year	2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
safety." (Golder Associates, 2018, p. 13)					significantly in 2020, with work-related visits doubling and more than doubling, respectively.		
	Project combined lost-time and light duty accident frequency (per 200,000 person-hours)	N/A	/	↓	The lost time and light duty accident frequency rate incidents per 200,000 person-hours worked) at Agnico Eagle projects declined slightly to 1.48 in 2020 from 1.64 in 2019. Note that 2019 still involved a significant amount of construction.		
9. Community Infrastructure and Services	9.1 Use of GN health services						
MEADOWBANK: "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) WHALE TAIL: "Project-induced migration can increase demand on physical infrastructure…[but] no Project employment-driven migration or	Kivalliq community health centre visits per capita	**/**	**/**	/	It is unclear whether and to what extent Agnico Eagle's projects have impacted health centre usage in Kivalliq communities. In 2020, 26 employees were referred to community health care centres, down from 125 in 2019. Since 2010, the majority of visits to Agnico Eagle clinics have been for non-work-related conditions. This indicates that these clinics may lessen the local health infrastructure burden. Incidents requiring use of GN health services decreased at Meadowbank / Whale Tail (down from 16 to 4).	MEADOWBANK "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) WHALE TAIL "Project-induced in-migration could increase demand for services and infrastructure in Baker Lake and Rankin Inlet … [including] healthcare services." (Golder Associates, 2018, p. 17)	MEADOWBANK – TBD (cannot be determined at this time) WHALE TAIL - TBD (cannot be determined at this time)
	Employees referred to community health care centre (personal and work-related) (2018)	N/A	N/A	↓			
	Incidents requiring use of GN health services	N/A	↓	↓			
	9.2 Use of public infrastructure						

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends Pre-dev	MBK / WT Trends Post-dev	MBK / WT Trends Last year	2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
population change is anticipated." (Golder Associates, 2016, p.3-C-39)	Estimates of use of public physical infrastructure directly related to Project (airports, port, meeting facilities, roads)	/	/	/	The use of public physical infrastructure by Meadowbank / Whale Tail 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. Both Meliadine and Meadowbank AWARs continue to see significant community usage.	MEADOWBANK "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) WHALE TAIL "Project-induced in-migration could increase demand for services and infrastructure in Baker Lake and Rankin Inlet." (Golder Associates, 2018, p. 17)	**MEADOWBANK & WHALE TAIL – Prediction not supported or refuted (see Discussion, Section 12.4.6.2.4)**
	All-weather access road (AWAR)	N/A	/	↑			
	9.3 Social assistance						
	Per capita social assistance expenditures by community	↓	/	N/A	No new data were obtained in 2020. Per capita social assistance expenditures declined in all Kivalliq communities in 2018 (the latest year for which data is available) following an increase across communities starting in 2012, though current levels are still above the historical average. The percentage of households receiving social assistance has been remaining steady or declining for most Kivalliq communities over the past 10 years. Despite declines from historical highs, social assistance data does not show a clear correlation between Agnico-related employment and social assistance requirements in Baker Lake or Arviat. Data suggests that both expenditures and	MEADOWBANK "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) WHALE TAIL - none	**MEADOWBANK – Prediction not supported or refuted (see Discussion, Section 12.4.6.2.5)** WHALE TAIL - N/A
	Percentage of households receiving social assistance by community	↓	↓	N/A			

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends Pre-dev	MBK / WT Trends Post-dev	MBK / WT Trends Last year	2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
					percentage of households receiving social assistance have been declining in Rankin Inlet since Meadowbank began operation.		
10. Nunavut Economy	10.1 Royalties and taxes						
MEADOWBANK: "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) WHALE TAIL: "The Project will contribute to territorial economic activity via expenditures, procurement and Gross Domestic Product contributions." It will also "contribute to government revenues through the payment of taxes and royalties." Both contributions "will be large relative to [the] territorial economy."	Project payments, royalties and taxes	↑	↑	↑	Agnico Eagle continues to pay taxes, royalties and other payments to the Government of Nunavut, Government of Canada, NTI and the KIA. Total values paid across sites rose from \$89M in 2019 to \$115M in 2020.	MEADOWBANK – none WHALE TAIL "The Project will contribute to government revenues through the payment of taxes and royalties, [which will be]…large relative to [the] territorial economy." (Golder Associates, 2016, p. 3-C-38)	MEADOWBANK – N/A WHALE TAIL - Prediction supported
	10.2 Trade Balance						
	Nunavut trade balance	↓	→	↑	Nunavut's trade balance held fairly steady from 2010 to 2017, averaging -\$1,076M, but has been about \$300M lower in 2019 and 2020, with a balance of -\$1,328M in 2020, up slightly from -\$1,385M in 2019. Lower trade balances have coincided with the years of Agnico Eagle mine construction, as large construction projects tend to increase the trade deficit.	MEADOWBANK – none WHALE TAIL - none	N/A

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends Pre-dev	MBK / WT Trends Post-dev	MBK / WT Trends Last year	2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
	10.3 Nunavut GDP						
	Nunavut GDP by all industries and mining, quarrying and oil & gas	↑	↑	↑	GDP growth from 2009 onwards in Nunavut correlates well with an increase in mining, quarrying and oil & gas activity across the territory. The average annual rate of GDP growth from 2011 to 2019 was 5%. The initial growth in mining GDP leading up to 2011 coincides with Meadowbank construction – construction expenditures, and thus impact on GDP, tend to be greater than mine operations – and construction of Baffinland's Mary River Project in the years leading up to 2014. The resumption of growth in mining GDP in 2017 coincides with Meliadine construction.	MEADOWBANK "The results indicate that during the construction phase, the project would contribute $120.3 M to the GDP of Nunavut … During the operations phase, the annual contribution to GDP would be $35.5M…" (Cumberland Resources, 2006, p. 119) WHALE TAIL "During operations, the Expansion Project will represent a contribution to the territorial economy, with total annual GDP contributions of $100 million to $120 million annually." (Golder Associates, 2018, p. 7)	MEADOWBANK – Prediction exceeded (+) WHALE TAIL – Prediction supported
11. Gender	11.1 Gender-specific initiatives						
MEADOWBANK – none WHALE TAIL - none	Overview and assessment of gender-specific initiatives	N/A	/	/	Agnico Eagle is continuing to develop its policy and programs to encourage greater gender equality. At present, four programs are active (though two of these are paused due to COVID-19 restrictions), one is under development, and eight more programs are under consideration.	MEADOWBANK – none WHALE TAIL - none	MEADOWBANK - N/A WHALE TAIL - N/A

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
	11.2 Project employment by gender						
	Project employment (gender)				Overall female employment FTEs (i.e., employed by Agnico Eagle and contractors) for both projects increased slightly to 13% in 2020 from 12% in 2019.	MEADOWBANK – none WHALE TAIL - none	MEADOWBANK - N/A WHALE TAIL - N/A
	Headcount	N/A	↑	↑	In terms of FTE counts of Agnico Eagle employment, there were 173 female FTEs at Meadowbank / Whale Tail in 2020, up from 159 in 2019. In terms of FTE counts of contractor employment, there were 51 female FTEs at Meadowbank / Whale Tail in 2020, up from 22 in 2019.	MEADOWBANK – none WHALE TAIL - none	MEADOWBANK - N/A WHALE TAIL - N/A
	Rate	N/A	→	→	In terms of Agnico Eagle employment FTEs, the proportion of female employment at Meadowbank / Whale Tail in 2020 was 18%, the same as in 2019. In terms of contractor employment FTEs, the proportion at Meadowbank / Whale Tail in 2020 was 7%, up from 4% in 2019.	MEADOWBANK – none WHALE TAIL - none	MEADOWBANK - N/A WHALE TAIL - N/A
	11.3 Project employment by gender and skill level						
	Project employment by skill level (gender)	N/A	N/A	N/A	Across all of the Projects, approximately one-third of female employees are in semi-skilled positions, one-third are in management and professional positions, and the remaining third is split between unskilled (22%) and skilled positions (11%). Over the past three	MEADOWBANK – none WHALE TAIL - none	MEADOWBANK - N/A WHALE TAIL - N/A

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2020 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
					years, the greatest growth has occurred in the number of semi-skilled and management and professional jobs being filled by women.		

12.4.6.2 *Parts 3 & 4: Discussion*

For each metric with a specific FEIS prediction that is not supported (as identified in Table 12-17), a trend analysis and discussion is provided here from the 2020 Socio-Economic Monitoring Report (Appendix 52). That report further provides trend analyses and discussions for every metric assessed in Table 12-17, above.

12.4.6.2.1 Project Inuit Employment (Agnico Eagle and Contractors)

A complete discussion of this issue is provided in Section 1.2 of the 2020 SEMR (Appendix 52), as summarized below.

FEIS Prediction:

MEADOWBANK – none

WHALE TAIL (including contractors) -

> 25% of direct construction positions will be sourced locally, and are expected to be filled by the existing Meadowbank Mine workforce (Golder Associates, 2016, pp. 7-51)
>
> Operational employment is expected to be 931 positions…of these nearly half (392 or 42%) are expected to be filled by Nunavummiut (Golder Associates, 2016, pp. 7-52)
>
> “The Expansion Project serves to extend employment opportunities for the Approved Project workforce, and adds a projected 99 opportunities for Nunavummiut” (Golder Associates, 2018, p. 19)

Discussion: Trends in Agnico Eagle and contractor employment numbers are provided in Figures 58 and 59. At Meadowbank / Whale Tail, Inuit FTEs comprised 15% of the total in 2020, down from 20% in 2019, and significantly lower than the 42% predicted. The primary reason for this decline from 2019 is assumed to be due to the impact of COVID-19 restrictions. However, as we compare actual numbers to predictions, it is important to note that the prediction (392 or 42%) was based on headcount, which results in higher numbers than FTEs (see footnote 7).

Due to health and safety concerns related to the COVID-19 pandemic, Agnico Eagle maintained employment of its existing Nunavummiut employees (all of whom are Inuit) but did not hire new Nunavummiut employees as they were not permitted to work on site. Community recruitment efforts were also paused due to the pandemic.

The relatively low level of Inuit employment at Agnico is explored in the KLMA. The 2020 KLMA repeats findings of previous versions – that the Kivalliq Inuit labour supply does not meet Agnico Eagle’s labour demands due to a combination of factors related to demographics, education and skills, and willingness to work. The 2020 KLMA notes that at a high level there would appear to be sufficient Inuit labour for Agnico’s demands, but that once one looks at the details it is clear that there are several important and substantial obstacles towards Agnico fulfilling its Inuit Employment Goals, and identifies a range of strategies and measures to improve Inuit participation in Agnico employment.

Figure 58 Project Agnico Eagle employment (Inuit & non-Inuit)

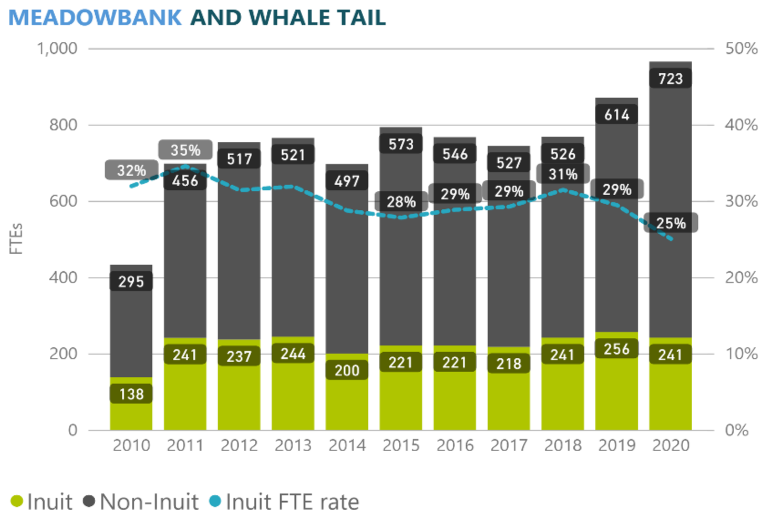
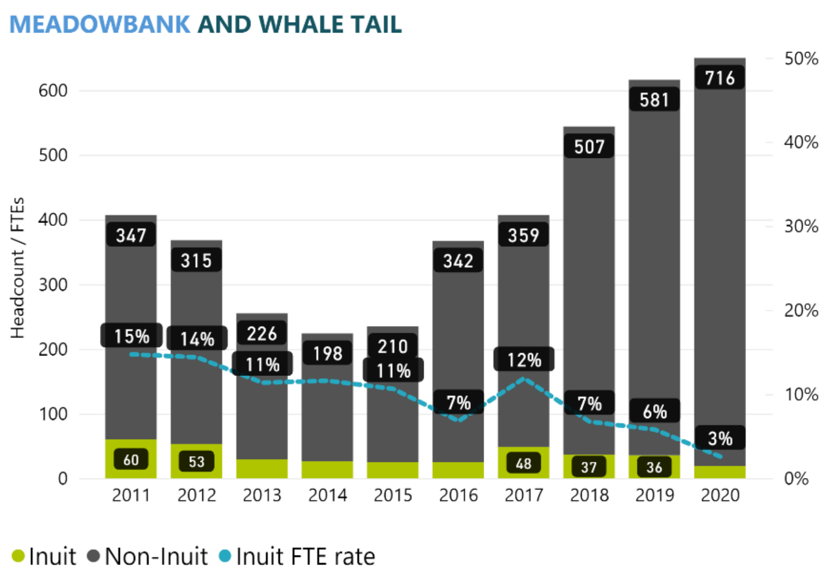


Figure 59 Project contractor employment (Inuit & non-Inuit) [7]



12.4.6.2.2 Project Agnico Eagle Employment by Kivalliq Community

A complete discussion is provided in Section 1.3 of the 2020 SEMR (Appendix 52), and the issue is summarized below.

[7] Due to data availability, post 2017 Meadowbank / Whale Tail contractor data and all Meliadine contractor data represent full time equivalents (FTEs), derived based on person-hours worked. The remainder of data points (Meadowbank 2010 to 2016) represent the number of employees as a snapshot at one time of year. Trends between these years should be interpreted with caution.

***FEIS Prediction*:**

MEADOWBANK - none

WHALE TAIL –

> "The FEIS estimates 217 positions will be filled by employees from Baker Lake." (Golder Associates, 2016, pp. 7-53)

Discussion: From 2016 – 2019, the number of Kivalliq-based Inuit employees rose by at least 5% every year, reaching 334 (Meadowbank / Whale Tail) in 2019, but in 2020 this number shrunk to 299, an 8% decline from 2019. Of these, 190 were from Baker Lake. The Whale Tail EIS prediction of 217 employees from Baker Lake is therefore not currently fully supported

12.4.6.2.3 Project Employment by Skill Level

Overall, despite the investments that the company has been making since project initiation, the data indicate that Agnico Eagle has had limited success at growing the number of Kivalliq Inuit labour in higher skilled positions. A summary of the interpretation is provided (see Appendix 52, Section 4.4)

***FEIS Prediction*:**

MEADOWBANK - none

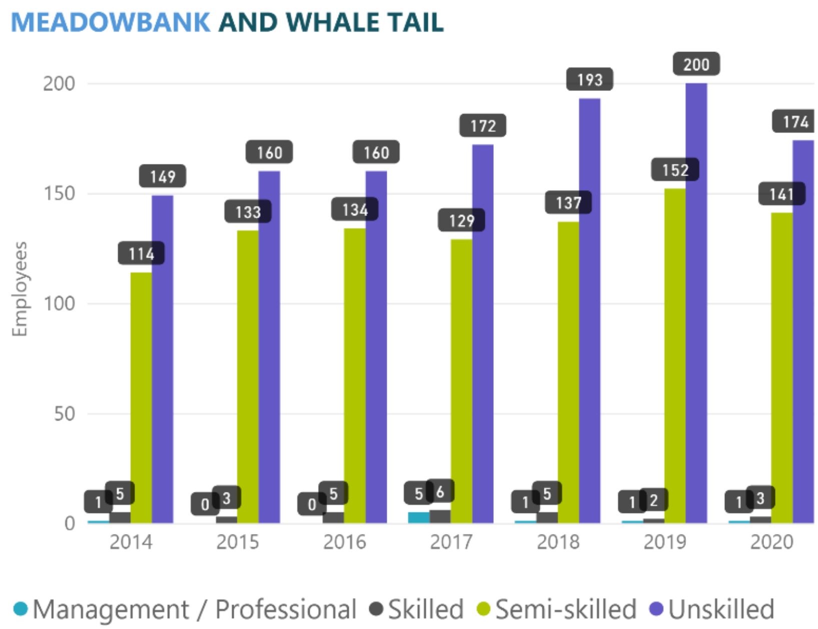
WHALE TAIL –

> "As Nunavummiut employees achieve further training and education, it is expected that they will be better poised to advance to more skilled positions as they arise, thereby increasing representation of Nunavut residents in the skilled, professional and management employment categories" (Golder Associates, 2016, pp. 7-55)

***Discussion*:**

Figure 60 shows the number of Inuit employees at each skill level between 2014 and 2020. Despite significant investments in training since the projects opened nearly ten years ago, there are still only four Inuit in skilled or management/professional positions at Meadowbank / Whale Tail. The 2018 IWBS (Mining Industry Human Resources Council, 2018a) and KLMA (Mining Industry Human Resources Council, 2018b) identify several barriers to retention and advancement of Inuit in the workplace, and provide some insight into addressing these challenges.

Figure 60 Project Agnico Eagle Inuit employees by skill-level



12.4.6.2.4 Use of Public Infrastructure

The complete interpretation of this metric is provided in Appendix 52 (Section 9.2), with a summary below. The predictions are not specifically supported or refuted by the available data.

FEIS Prediction:

MEADOWBANK

> "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)

WHALE TAIL

> "Project-induced in-migration could increase demand for services and infrastructure in Baker Lake and Rankin Inlet." (Golder Associates, 2018, p. 17)

Discussion:

The use of public physical infrastructure by Meadowbank / Whale Tail 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.

12.4.6.2.5 Social Assistance

Changes in community use of social assistance are discussed in Appendix 52, Section 9.3, and summarized below. The predictions are not specifically supported or refuted by the available data.

FEIS Prediction:

MEADOWBANK

> "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)

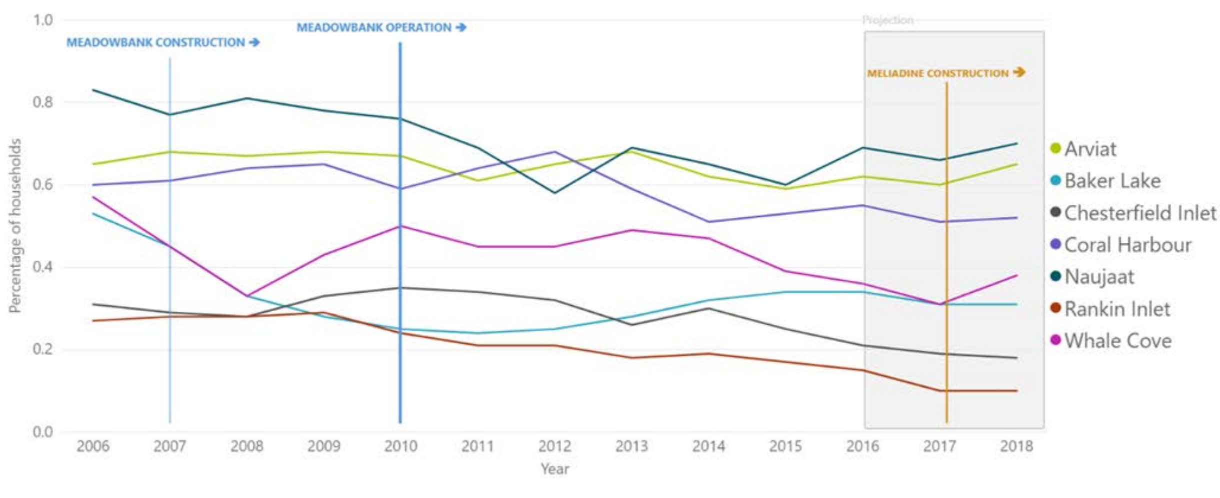
WHALE TAIL - none

Discussion:

Figure 61 shows the percentage of households receiving social assistance by Kivalliq Community. 2018 is the last year for which data was available. Per capita social assistance expenditures declined in all Kivalliq communities in 2018 following an increase across communities starting in 2012, though current levels are still above the historical average with the exception of Rankin Inlet. The percentage of households receiving social assistance has been steady or declining across the region over the past decade. Despite declines from historical highs, social assistance data do not show a strong correlation between Agnico-related employment and social assistance requirements; other factors may be at play.

The need for social assistance is often determined by a diverse range of factors. Due to this, along with an inability to observe a correlation between project activities and social assistance data, any impact between Agnico Eagle projects and social assistance cannot be determined at this time.

Figure 61 Per capita social assistance expenditures by community



(Department of Family Services, 2019; Statistics Canada, 2006a; Statistics Canada, 2011a; Statistics Canada, 2016a)

12.4.6.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

Existing monitoring programs are able to address most FEIS predictions (Table 12-17), so these monitoring measures are considered to be effective. In some cases, existing monitoring programs (mainly those run at the community- or territory-level) cannot specifically determine the impact of Agnico's operations on observed changes. Namely these metrics include: health centre visits, social assistance use, and health and safety awareness among families and communities.

Effectiveness of Mitigation

A summary of the planned mitigation measures for socio-economic impacts for the Meadowbank operations phase (per FEIS, Appendix B, Table B.15-2) along with implementation in 2020 is provided in Table 12-18.

A summary of the planned mitigation measures for socio-economic impacts for the Whale Tail construction and operations phase (per FEIS, Volume 3, Table 3-C-8, Table 3-C-9, Table 3-C-10) along with implementation in 2020 is provided in Table 12-19.

Overall, the only potentially significant departures from FEIS predictions identified in Section 12.4.6.1 are regarding Project Inuit employment, and Project employment by skill level. Agnico continues to recognize and address these gaps through new management and mitigation initiatives such as the Rapid Inuit Specific Education (RISE) Program (initiated 2019), and others, as described in the 2020 SEMR.

Table 12-18 Mitigation measures described in the Meadowbank Project FEIS to reduce impacts of the project on socio-economic VECs (sub-headings in italics), and commentary on current implementation.

Planned Mitigation Measure (FEIS, Appendix B, Table B.15-2)	Implementation (unless indicated, reference to 2020 Socio-Economic Monitoring Report, Appendix 52)
Employment, training, and business opportunities	
Preferential employment and contracting	**Yes -** see Section 1.1, 3.1 and "Existing Management and Mitigation"
Preferential hiring	**Yes -** see Section 1.1, 3.1 and "Existing Management and Mitigation"
Preferential procurement	**Yes** - see Section 3.1
Education and training initiatives	**Yes –** Section 4
Education initiatives directed at specific concern around youth and their future in a mixed economy	**Yes –** Section 4.1 and 4.2 and "Existing Management and Mitigation"
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** – Section 5
Workforce management and community initiatives in support of traditional activity	**Yes** – Section 5
Individual and community wellness	
Assistance to individuals experiencing problems and their families, zero tolerance policies	**Yes** – Section 7.1
Short rotations	**Yes –** Inuit Workforce Barriers and Strategies (IWBS) report (Appendix 61 of the 2018 Annual Report)

Planned Mitigation Measure (FEIS, Appendix B, Table B.15-2)	**Implementation (unless indicated, reference to 2020 Socio-Economic Monitoring Report, Appendix 52)**
Workforce management best practice, including codes of conduct, rotation to point of hire, etc.	**Yes –** Inuit Workforce Barriers and Strategies (IWBS) report (Appendix 61 of the 2018 Annual Report)
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** – e.g. Emergency Response Team (ERT) Training, Crisis Management Plan, Emergency Response Plan
Support for community wellness initiatives	**Yes** – Section 7
Infrastructure and social services	
Employment at good wages	**Yes** – Section 1 and 2
Avoidance of sites of heritage significance, protocol in place in event that new sites are identified	**Yes** – Socioeconomic and Archaeology Management Plan: 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.

Table 12-19 Mitigation measures described in the Whale Tail Project FEIS to reduce impacts of the project on socio-economic valued components (sub-headings in italics), and commentary on current implementation. Excludes environmental design features, as these are a component of completed design plans and not ongoing mitigation. TEMP = Terrestrial Ecosystem Management Plan.

Planned Mitigation Measure (FEIS Table 3-C-1)	**Implementation (2020)**
Heritage Sites	
Complete heritage assessment for the Project footprint to identify archaeological sites present.	**Yes** – Socioeconomic and Archaeology Management Plan - 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.
Alter or adjust the location of a Project component or activity to fully avoid impacts on culturally important sites such as graves; otherwise mitigate and conduct heritage resource surveys in accordance with the GN department of Culture and Heritage.	
For archaeological sites that will be adversely affected by the Project, and where more passive mitigation strategies (e.g., capping, relocation) are not viable for those locations, preservation by systematic recording (i.e., excavation or documentation) is an option.	
Complete additional heritage baseline assessment for any changes to the Project footprint in areas considered to have potential to contain heritage resources.	
Agnico Eagle will mark the perimeter of heritage sites to be avoided with flagged stakes or similar, will erect “no work zone” signage, and, if in a potentially high traffic area, will erect snow fencing or similar barrier to prevent entry. Agnico Eagle will monitor condition of site barriers.	N/A,
Agnico Eagle will include no work areas on project drawings.	**Yes** – Socioeconomic and Archaeology Management Plan
Provide awareness training for Agnico Eagle and Contractors that includes general guidelines for the appropriate response to the inadvertent discovery of known or suspected archaeological materials.	**Yes** – Socioeconomic and Archaeology Management Plan
Traditional Land Use – Wildlife Harvesting	
Surveys of proposed granular sources for dens and nests	**Yes** – TEMP

Planned Mitigation Measure (FEIS Table 3-C-1)	**Implementation (2020)**
will take place prior to construction.	
Wildlife will have the right-of-way and vehicle traffic will be minimized according to the TEMP. Maximum speed limits of 50 km/hr will be enforced.	**Yes** – TEMP
Traffic volumes will be managed and roads closed when large numbers of caribou are present, in consultation with the HTO, GN, and KIA according to the TEMP.	**Yes** – TEMP
All employees will be provided with wildlife environmental awareness training.	**Yes** – TEMP
Drivers will be alerted when caribou are observed near the haul road.	**Yes** – TEMP
Littering and feeding of wildlife will be prohibited.	**Yes** – TEMP
Employees will be notified when caribou, muskox and predatory mammals are observed in the local study area.	**Yes** – TEMP
Land will be cleared outside the breeding season (June 1 to August 1). Mitigation to reduce impacts to nesting birds will be discussed with Environment Canada.	**Yes** – TEMP
All spills will be immediately reported, cleaned up and/or isolated from the receiving environment. Ready access to emergency spill kits. Regular maintenance of equipment to reduce oil leakage. Training in refueling procedures for site staff. Hazardous materials and fuel will be stored according to regulatory requirements.	**Yes -** Detailed mitigation is provided in the Emergency Response Plan, Hazardous Materials Management Plan, Whale Tail Haul Road Management Plan and Spill Contingency Plan.
Monitoring for bird nesting activity. Birds showing nesting activity will be discouraged from nesting and roosting on site infrastructure.	**Yes -** Detailed mitigation is described in the TEMP.
Attenuation Ponds will be monitored for use by water birds. Deterrents will be used if required. Attenuation Ponds will be monitored for water quality.	**Yes -**Detailed mitigation is described in the TEMP.
Enforce no hunting, trapping, harvesting or fishing policy for employees and contractors. Hunter harvest survey, consistent with the Meadowbank Mine will continue. Access to the Project will be controlled (gated at Meadowbank); Restricting public vehicle access beyond km 85 of Meadowbank All-weather Access Road. All efforts will be made to enforce a no shooting zone for the public along the road and around the Project site.	Detailed mitigation is provided in the Whale Tail Haul Road Management Plan, Interim Closure Plan and Reclamation Plan and TEMP.
Any PAG or high metal leaching waste rock will be segregated at source and placed into designated areas within waste rock storage facilities to control acid generating reactions and the migration of contaminants. Leachate from the waste rock piles will be monitored and controlled and not released to the natural environment.	**Yes -** Detailed mitigation is provided in the Operational ARD-ML Sampling and Testing Plan, Landfarm Design and Management Plan, Landfill Design and Management Plan, and Mine Waste Rock and Tailings Management Plan, Air Quality and Dustfall Monitoring Plan, Road Management Plan, Water Management Plan, AEMP, CREMP and the TEMP.
Traditional Land Use - Fishing	
Best management practices for erosion and sedimentation control (e.g., ground cover, silt fences and curtains, runoff management), where needed.	**Yes –** Water Management Plan
Quarries will be inspected on a regular basis to monitor water ponding, particularly at spring melt; when there is flow from a quarry that could enter a waterbody, a water quality sample will be collected and analyzed.	**Yes –** Water Quality and Flow Monitoring Plan
The dike will be constructed using non- potentially acid-generating rock or low potential for metal leaching material	**Yes**
In-stream works will be constructed in winter, when possible, to avoid increased TSS and turbidity, and changes to water and sediment quality.	Best practices
Mining staff will not be allowed to hunt or fish while on their work rotation; Agnico Eagle will develop and enforce “no	**Yes**

Planned Mitigation Measure (FEIS Table 3-C-1)	**Implementation (2020)**
hunting, trapping, harvesting or fishing policy" for employees and contractors, which will be consistent with the Meadowbank Mine.	
Runoff and seepage from the Project site will be diverted to sumps and attenuation ponds (and treated if required), prior to release.	**Yes –** Water Management Plan, Water Quality and Flow Monitoring Plan
Water quality in attenuation ponds will be monitored and managed such that the discharge meets discharge limits.	**Yes –** Water Quality and Flow Monitoring Plan
Any potentially acid generating (PAG) or high metal leaching waste rock will be segregated at source and placed into designated areas within the waste rock storage facility.	**Yes –** Operational ARD-ML sampling and testing plan
Traditional Land Use – Plant Gathering	
Implement the spill plan for potential chemical spills, including hydrocarbons.	**Yes -** Spill Contingency Plan
Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, sloping of banks), where needed.	**Yes –** Erosion Management Plan
Use of non-acid generating materials for road bed and fills.	**Yes –** Operational ARD-ML sampling and testing plan
Implement dust control measures on mine roads, when required, including enforcing speed limits.	**Yes –** Air Quality and Dustfall Monitoring Plan, Road Management Plan
Road surfaces will be maintained through grading and the addition of granular material.	**Yes –** Road Management Plan
Equipment and vehicles will comply with relevant non-road emission criteria at that time of purchase.	**Yes**
Waste rock management procedures developed for potentially problematic waste rock/overburden material. Implement the Mine Waste Rock and Tailings Management Plan.	**Yes** - Mine Waste Rock and Tailings Management Plan.
Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers.	**Yes –** Hazardous Management Plan
Adherence to the AWAR and Whale Tail Pit Haul Road Dustall Monitoring Plan (Appendix B of the TEMP).	**Yes** – Air Quality and Dustfall Management Plan
Traditional Land Use – Culturally Important Sites	
See measures listed under Heritage Resources, above.	**N/A**
Provide ongoing consultation with the community of Baker Lake (specifically Elders and the HTO Members), and provide opportunities for participation in heritage resource surveys and mitigation measures.	**Yes**
Best Management practices for controlling equipment noise emissions, including: • Use of silencers on all trucks • Enforcing speed limits • Regular maintenance will be implemented for equipment and vehicles	**Yes –** Noise monitoring and abatement plan
Implement the mitigation measures outlined in the Noise Monitoring and Abatement Plan that was developed for the Meadowbank mine site in 2009 (Agnico Eagle 2009) and refined in 2013 (Agnico Eagle 2013).	**Yes –** Noise report
Traditional Land Use Access	
The haul road will be closed to the public. Access to the Project will be controlled (gated at Meadowbank); Restricting public vehicle access beyond km 85 of Meadowbank All-weather Access Road.	**Yes**
Enforce no hunting, trapping, harvesting or fishing policy for employees and contractors.	**Yes**
Hunter harvest survey, consistent with the Meadowbank Mine will continue.	**Yes -** TEMP

Planned Mitigation Measure (FEIS Table 3-C-1)	**Implementation (2020)**
Agnico Eagle will work with local wildlife harvesters to ensure the preferred ATV and snowmobile crossing areas are well identified for both hunters and operators on the road.	**Yes** – HTO/Elders consultation
Socio-Economics	
Use of existing Meadowbank Mine workforce.	**Yes**
Continue existing training initiatives for the Project's workforce.	**Yes –** see 2020 Socio-Economic Monitoring Program Report section "Existing Management and Mitigation"
Housing out-of-area workers in on-site camp; Fly-in/fly-out to and from Kivalliq communities	**Yes**
Continue social management approach identified in the Socio-Economic Management and Monitoring Plan (Appendix 8-E.6).	**Yes**
Implement noise and air quality mitigations including: Adherence to the • Air Quality Monitoring Plan. • Enclosures are used to reduce fugitive emissions at the processing facility. • Adherence to the Incinerator Waste Management Plan •Adherence to the AWAR and Whale Tail Pit Haul Road Dustfall Monitoring Plan (Appendix B of the TEMP). • Best Management practices for controlling equipment noise emissions, including use of silencers on all trucks • Enforcing speed limits. • Regular maintenance will be implemented for equipment and vehicle.	**Yes**- Air and Noise reports

Adaptive Management

Existing management and mitigation related to VSECs is described in the 2020 SEMR (Appendix 52), with any comments for changes to implementation in 2021. These include, for example, a new Community Liaison Officer (CLO) development program, with the objective to maximize CLO involvement within each community and to foster better communication channels between the communities and Aginco operations.

12.5 WHALE TAIL PEAMP EVALUATION

For each valued component (VC) in the FEIS Addendum for the Whale Tail Pit – Expansion Project (Agnico Eagle, 2018), a summary of the primary effects pathways that were evaluated is provided in Section 12.3. The completed PEAMP evaluation for residual effects associated with those pathways is presented in Sections 12.5.1 – 12.5.6, below.

VCs in this FEIS Addendum include Climate, Air Quality, Noise, Permafrost, Terrestrial Environment (vegetation, wildlife and birds), Aquatic Environment (surface water quantity, surface water quality, hydrogeology and groundwater, fish and fish habitat), Heritage Resources, Traditional Land Use, and Socio-Economics. These are generally the same VCs as identified and assessed for the original Meadowbank FEIS (Cumberland, 2005). For two VCs (hydrogeology and groundwater, heritage resources) no primary effects pathways or residual impacts were identified. For the remaining VCs, predicted residual impacts and measured residual impacts are examined here.

12.5.1 Aquatic Environment

Key mine development activities that could result in changes to the aquatic receiving environment for the Whale Tail site include: Whale Tail and Mammoth Dike construction, IVR dike construction, dewatering of Whale Tail Lake – North Basin and the IVR area waterbodies, effluent discharge, and dust generated through onsite activities including roads.

Within the Project FEIS Addendum (Agnico Eagle, 2018), impacts to the aquatic environment potentially generated through these activities are described for water quantity, water quality, and fish/fish habitat. Predicted and measured residual impacts for each of these VCs are described below.

12.5.1.1 *Water Quantity*

12.5.1.1.1 Parts 1 & 2: Summary of Predicted and Measured Residual Impacts

A summary of predictions for impacts to surface water quantity (FEIS Addendum, Section 6.3, as summarized in Table 3-C-5) and the accuracy of these predictions since 2019 (measured impacts) are provided in Table 12-20. Cells are highlighted in grey when measured impacts exceed predictions for the current year. Future results will be added to that section to ensure historical trends can be observed, even when predicted impacts are not exceeded in a given year.

Table 12-20 Predicted and measured impacts to surface water quantity for the Whale Tail Site during the constructions and operations period (primary pathways according to FEIS Volume 3, Table 3-C-5). Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.5.1.1.2.

Primary Effect Pathways	Residual Impact	Proposed Monitoring	Key Monitoring Parameters	Key Predicted Impact	Measured Impact	
					2019	2020
Project footprint, which will physically alter watershed areas and drainage patterns, may change downstream discharge, water levels, and channel/bank stability in streams, and affect water quality, fish habitat, and fish	Change in discharge rate and the spatial distribution of water	Monitoring of flows and water levels at key locations All piped and/or pumped discharges to waterbodies will be monitored continuously Climate monitoring, including continuous measurements of rainfall and temperature, will be performed to allow validation of the hydrological model, assessment of seasonal conditions and to provide input to water management. Whale Tail Pit Haul Road Management Plan	Whale Tail South water level	Operations (2020+): 156.0 masl	See discussion, Section 12.5.1.1.2.1 below	
Dewatering of lakes may change discharges, water levels, and channel/bank stability in receiving and downstream waterbodies, and affect water quality, fish and fish habitat			Mammoth Lake water level	Construction (2018): Decrease from baseline Dewatering (2019): Slight decrease from baseline Operations (2020/2021): Slight increase from baseline	See discussion, Section 12.5.1.1.2.2 below	
			Northeast Diversion water level	Dewatering in 2020 to permit construction of the IVR Pit	See discussion, Section 12.5.1.1.2.3 below	
			Nemo Lake water level	Operations (2020+): similar to or slight decrease from baseline	See discussion, Section 12.5.1.1.2.4 below	
Alteration of watershed flow paths may change flows, water levels, and channel/bank stability in diverted and receiving waterbodies, and affect water quantity, water quality, fish and fish habitat			Whale Tail Lake dewatering discharge monitoring	Total discharge will occur in 2019, with a volume of 4,643,712 m^3	4,940,198 m^3	741,620 m^3 See discussion, Section 12.5.1.1.2.1
			Freshwater withdrawal monitoring (Nemo Lake)	Operations – 2020+: 125,143 m^3/year NWB Water License 2AM-WTP1830: 209,544 m^3	50,559 m^3	43,252 m^3

12.5.1.1.2 Parts 3 & 4: Discussion

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here.

12.5.1.1.2.1 Whale Tail Lake Water Level and Dewatering Discharge

A complete discussion of measured and predicted water levels in the Whale Tail South flood zone is provided in the 2020 Report on Water Quality Monitoring for Dike Construction and Dewatering (Appendix 39) and summarized here.

From March to October, 2019, Whale Tail Lake – North Basin was dewatered with discharge to Whale Tail Lake – South Basin, and Mammoth Lake. Total dewatering discharge volume in 2019 was 4,940,198 m^3, which is within 7% of the FEIS-predicted value (4,643,712 m^3).

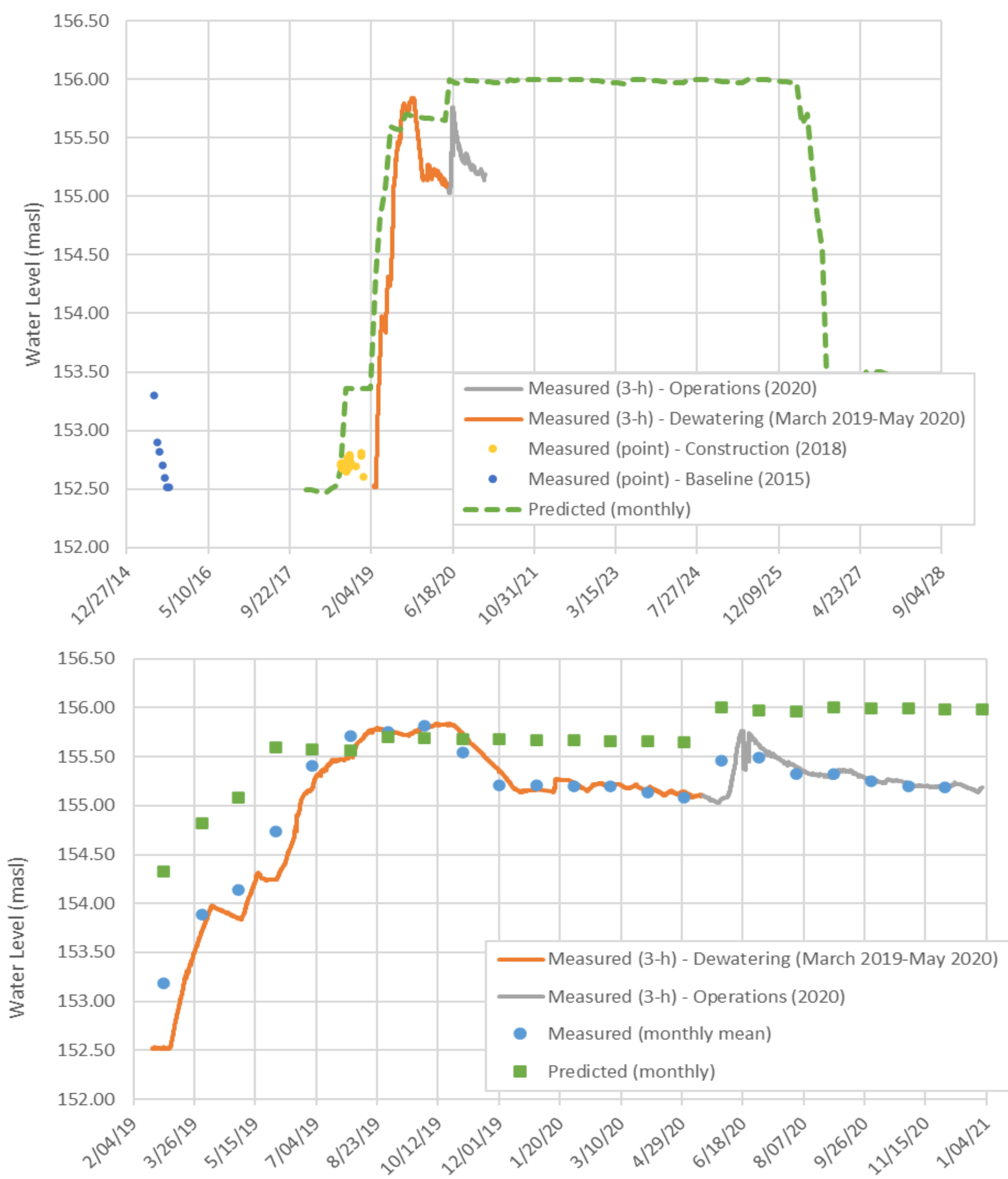
In 2020, dewatering of Whale Tail North to Whale Tail South occurred between January 1 and May 15, at which time the dewatering was complete. The total discharge volume in 2020 was 741,620 m^3. This volume includes Whale Tail Dike seepage water, as this was managed as part of Whale Tail North dewatering until May 2020. Dewatering of Whale Tail North was assessed in the Project FEIS (Agnico Eagle, 2016), and not re-visited in the FEIS Addendum. Dewatering of this area was planned to be complete in 2019 (e.g. Agnico Eagle, 2016 - Appendix 6-F, Section 6.F-2.1), so no dewatering discharge from Whale Tail North was predicted for 2020. However, contributions of discharge of Whale Tail Dike seepage to Whale Tail South water levels were qualitatively assessed in the FEIS Addendum (Section 6.3.3.1.4.1), and determined to result in negligible effects on surface water quantity.

Water levels in Whale Tail Lake South Basin as measured throughout 2019 and 2020 using piezometric data are shown in Figure 62a and b, below, along with measurements during the construction phase (2018; measured by GPS survey), available baseline measurements (2015), and FEIS Addendum predictions (from FEIS Appendix 6-F). Figure 62a shows the long-term trend in predicted water levels in relation to available baseline, dewatering- and operations-phase measurements. However, it is noted that FEIS-predicted water levels were calculated as monthly timesteps in a mean annual water balance, whereas measured water levels are assessed every 3 hours. Measured values may therefore be expected to vary around the prediction, due to both inter-annual climate variability and scale of measurement. Figure 62b more closely examines this variability for the period since flooding began (2019), and demonstrates in particular how the very rapid flood peak that is observed during freshet with daily water level measurements is substantially smoothed when monthly means are plotted.

Due to record rainfall, peak water levels in 2019 exceeded predictions in July (up to 155.8 masl), but did not reach the maximum predicted final flood level of 156.0 masl, which was planned to occur in 2020. Following discussions with NWB, Agnico pumped non-contact water from the Whale Tail South flood zone directly to Mammoth Lake beginning in October, 2019. This activity temporarily substituted for the passive flow which now occurs through the South Whale Tail Channel (SWTC). The SWTC was constructed from December 2019 – April, 2020 to direct water from the flooded lake A20 to Mammoth Lake. During freshet in 2020, water flowed through the SWTC as planned.

Water levels in Whale Tail South in 2020 were lower than FEIS Addendum model results, which predicted a level of 156.0 masl would be maintained throughout the operations period. This change follows an amendment to the final design[8] of the South Whale Tail Channel, which included a decrease in the original inlet elevation by 0.5 m, to 155.3 masl. Operational water levels moving forward are therefore expected to be lower than the 156.0 masl mark.

Figure 62 a and b. Measured (3-h interval and monthly mean, as indicated) and predicted water levels in the Whale Tail South flood zone. Predicted water levels from FEIS Addendum for the Whale Tail Pit Expansion Project, Appendix 6-O, Table D-14. Monthly mean water levels are plotted by the month start date.



[8] The completed construction summary report for the South Whale Tail Channel is available through the NWB public registry here: ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-WTP1830%20Agnico/3%20TECH/D%20CONSTRUCTION/D16/South%20Channel/

12.5.1.1.2.2 Mammoth Lake Water Level

Water levels in Mammoth Lake as measured primarily throughout the open water seasons of 2018 (construction period) and 2019 (dewatering period) by GPS survey are shown in Figure 63, along with available baseline measurements (2015) and 2020 piezometer results.

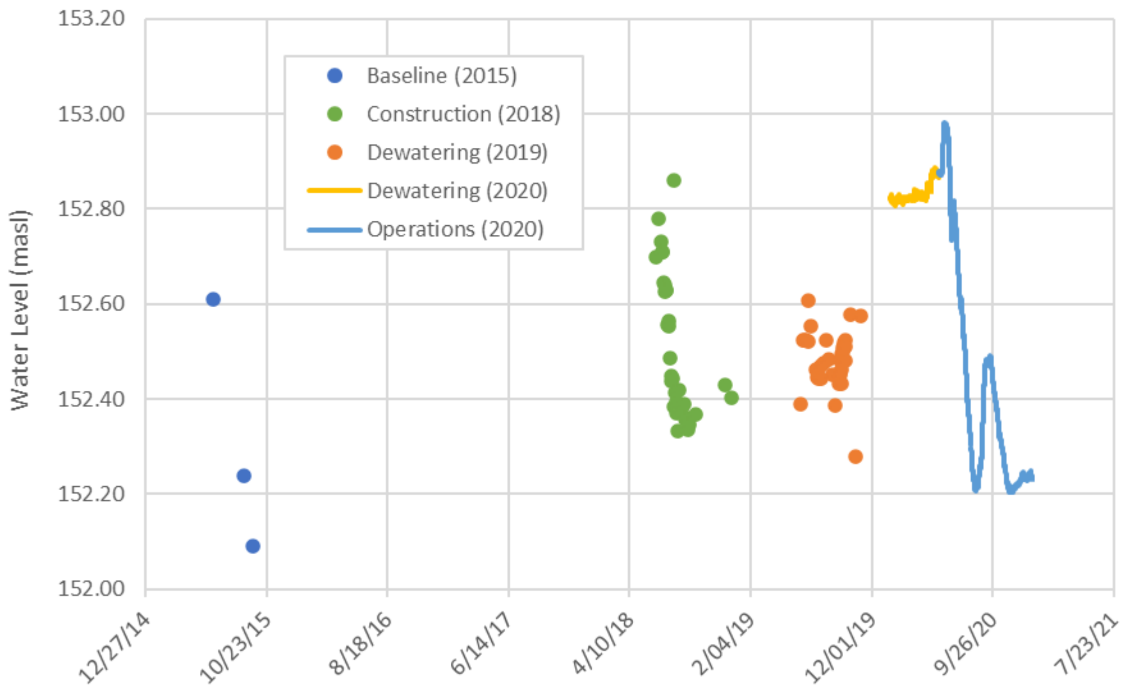
As shown in Table 12-21, FEIS predictions (Agnico Eagle, 2016 - Appendix 6-E) indicated that mean monthly water levels in Mammoth Lake would decline up to 12 cm below baseline values during the dewatering phase. Predictions for the operations phase were updated in the FEIS Addendum (Section 6.3.3.1.4.2, Table 6.3-3) and indicated that mean monthly water levels may increase up to 5 cm from baseline.

However, modeled baseline water levels were not specified in the FEIS documents, and measured baseline data for Mammoth Lake is only available for three time points in 2015. As a result, quantitative comparison of measured values to FEIS predictions is difficult. However, to date, measured water levels have not declined below baseline values measured in 2015.

Table 12-21 Predicted change in water levels from baseline in Mammoth Lake during the construction and dewatering phases (from FEIS Appendix 6-E) and operations phase (from FEIS Addendum Section 6.3.3.1.4.2, Table 6.3-3) under mean monthly discharge scenarios

Project Phase	June	July	August	September	October
Construction (m)	-0.16	-0.16	-0.11	-0.14	-0.13
Dewatering (m)	-0.12	-0.04	-0.05	-0.09	-0.10
Operations (m)	+0.05	+0.02	+0.03	+0.04	+0.03
Closure (m)	-0.20	-0.20	-0.14	-0.14	-0.13

Figure 63 Measured water levels in Mammoth Lake. Results from 2015 – 2019 are by GPS survey, and results for 2020 are from piezometric data (3-h intervals)



12.5.1.1.2.3 Northeast Diversion Water Levels

A complete discussion of measured and predicted water levels in the Northeast Diversion flood zone is also provided in the 2020 Migratory Bird Protection Report (Appendix E of the Wildlife Summary Report Appendix 47), and summarized here.

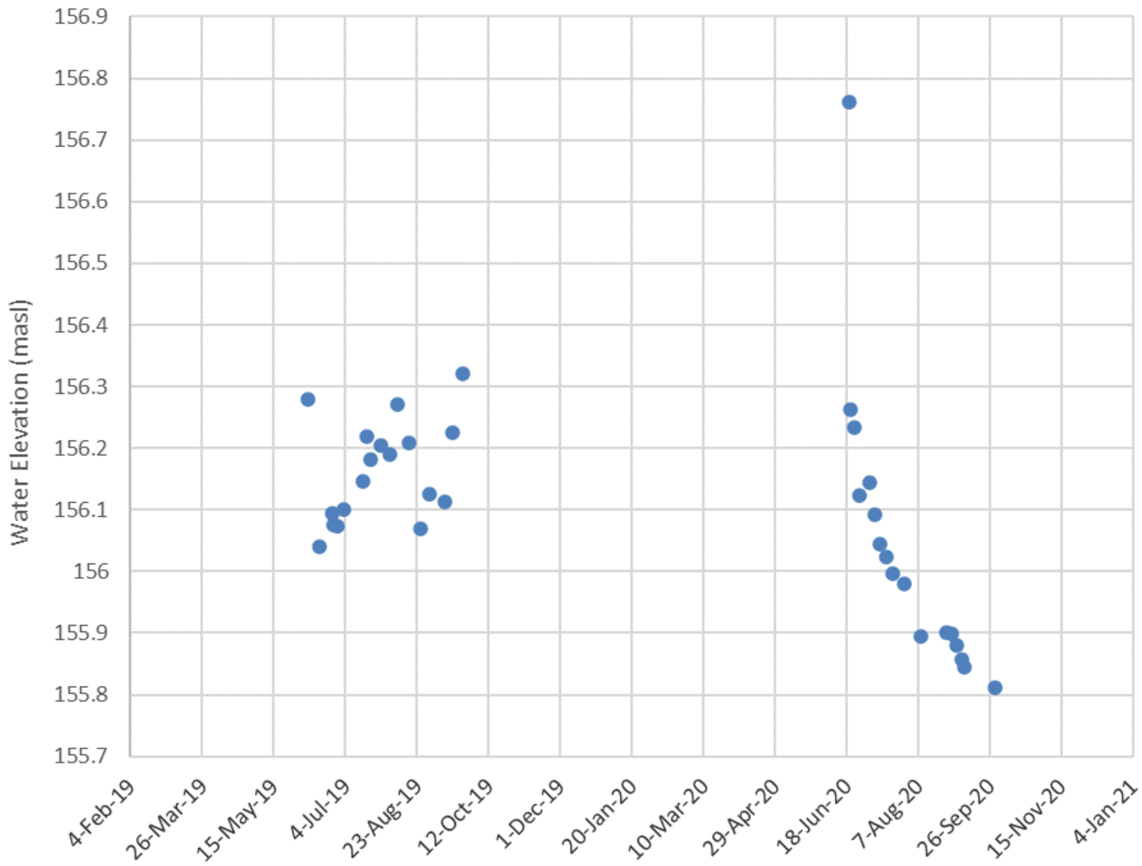
The Northeast Dike was constructed from September 2018 to February 2019. Original Whale Tail FEIS (Agnico Eagle, 2016) water management plans indicated that flooding in this area would increase to the maximum elevation of 156.6 masl, and then flow naturally through a tundra pond system to Nemo Lake. The maximum predicted flood level in this area (156.6 masl) was reached on July 6, 2019. At that point, it was observed that the topography toward Nemo Lake would not allow water to overflow naturally before overtopping the dike liner. As a result, following approval by NWB (see 2019 Annual Report for further details), non-contact water was pumped out of that area beginning in July, 2019, to maintain safe water operating levels against the Northeast Dike. Water was pumped from July to October 2019, and June to July 2020 towards the watershed of Nemo Lake.

Waterbodies in this area were then fished out in July – September 2020, and dewatered to permit construction of the Whale Tail Pit Expansion Project (IVR Pit area), and the Northeast Dike was dismantled. This area will undergo mine development activities, and no future flooding is planned.

12.5.1.1.2.4 Nemo Lake Water Levels

In the FEIS Addendum (Agnico Eagle, 2018), impacts to Nemo Lake water levels were assessed as a result of freshwater intake and changes to discharge patterns as a result of the IVR Diversion. During the operations phase, mean monthly water levels are expected to remain similar to baseline values in May and decrease by 0.07 m in June, 0.09 m in July, 0.08 m in August, 0.07 m in September, and 0.04 m in October, from the baseline values. Measured water levels are shown in Figure 64, but since baseline values are not defined, a comparison to FEIS Addendum predictions of change is not feasible.

Figure 64. Measured water levels in Nemo Lake (2019 – 2020).



12.5.1.1.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management

<u>Effectiveness of Monitoring</u>

Although FEIS recommendations for monitoring related to surface water quantity were not always specific, and comparisons of measured results to quantitative FEIS predictions was not always feasible, the monitoring programs being implemented at the Whale Tail site are able to measure changes in receiving environment water levels in key locations. Monitoring programs are therefore considered effective.

<u>Effectiveness of Mitigation</u>

A summary of the FEIS-planned mitigation measures for surface water quantity along with a commentary on implementation in 2020 is provided in Table 12-22. This summary excludes Environmental Design Features, which are incorporated into construction plans but are not ongoing mitigation measures included in this annual review.

Mitigation measures related to water quality and fish and fish habitat are provided in Sections 12.5.1.2.3 and 12.5.1.3.3, respectively.

Table 12-22 Mitigation measures described in the Whale Tail FEIS Addendum (Agnico Eagle, 2018) to reduce impacts of the project to water quantity during the construction and operations phases, and commentary on current implementation.

Project Activity	**Planned Mitigation Measure** (FEIS Addendum, Section 3, Table 3-C-5)	**Implementation (2020)**
Mine Infrastructure Footprint (e.g. open pits, site roads, access roads)	Best management practices for erosion and sedimentation control (e.g., ground cover, silt fences and curtains, runoff management), where needed.	**Yes** – Erosion Management Plan
Site Water Management: Dewatering of Project Footprint Lakes to Downstream Receiving Lakes	Pumped discharge will be directed to the lake environment, and not directly to outlets, to attenuate flow changes.	**Yes** – Water Management Plan
	If feasible, pumped discharge to the receiving environment will cease during the winter.	N/A
Site Water Management: Watershed Modification by Diversion of Water	Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, sloping of banks), where needed.	**Yes** – Erosion Management Plan
	Where practical, natural drainage patterns will be used to reduce the use of ditches or diversion berms.	**Yes** – Erosion Management Plan
General construction and operation of the Whale Tail Haul Road	Where deemed appropriate, use of staggered culvert configuration, and removal of snow at the culvert inlet and outlet prior to the freshet to promote drainage during spring thaw and freshet.	**Yes**
	Inspection prior to spring melt period to identify build-up of snow or ice, and take remedial action.	**Yes** – Freshet Action Plan
	Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts or drains to alleviate the risk.	**Yes** – Freshet Action Plan
Open Pits	Mined-out pit flooding will be augmented by active fresh water diversion active flooding will reduce the period required to flood the pits, and the period of time with increased hydraulic gradients between waterbodies.	**Yes** – Water Management Plan
Existing Meadowbank Infrastructure	See Meadowbank site PEAMP for water quantity	-

Adaptive Management

No adaptive management measures for water quantity are proposed for 2021 at this time, based on results of the above PEAMP analysis.

12.5.1.2 *Water Quality*

12.5.1.2.1 Parts 1 & 2: Summary of Predicted and Measured Residual Impacts

A summary of predictions for residual impacts to surface water quality (FEIS Addendum, Section 6.2, as summarized in Table 3-C-6) and the accuracy of these predictions in 2019 and 2020 (measured impacts) are provided in Table 12-23. Cells are highlighted in grey when measured impacts exceed predictions for the current year. Future results will be added to that section to ensure historical trends can be observed, even when predicted impacts are not exceeded in a given year.

To assess impacts of the Project on water quality, site-wide water quality modeling was conducted for the full suite of parameters (nutrients, metals, major ions) for the operations and closure phases. Water quality predictions were developed for locations within the mine footprint (attenuation ponds [Whale Tail and IVR], flooded Whale Tail Pit, flooded IVR Pit) and the downstream receiving environment (Mammoth

Lake, Lake A15, Lake A12, Lake A76, Downstream Node 1, and Downstream Node 2) (FEIS Addendum Table 6.2-3 and Figure 6.2-1).

This PEAMP evaluation focuses on a comparison of general water quality predictions for effluent and receiving environment locations with monitoring results from the Water Quality Monitoring Plan for Dike Construction and Dewatering, the Water Quality and Flow Monitoring Plan, and the Core Receiving Environment Monitoring Program. Water quality monitoring results for onsite locations are not specifically included in this review, since any discharge from those locations to the receiving environment is assessed under effluent monitoring.

Given the uncertainties associated with the FEIS Addendum water quality modelling exercise (i.e., the development stage of the Project, laboratory-based input values, assumptions where data do not exist and consideration of an average climate year), the predicted concentrations are considered by the modellers to be order-of-magnitude estimates (FEIS Addendum Section 6.2.3.3.1). This uncertainty is considered in comparisons of annual water quality monitoring data with FEIS predictions.

The 2020 CREMP report (Appendix 33) 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. In 2020, water chemistry data (monthly measured concentrations for each parameter) from Whale Tail South (WTS) and Mammoth Lake were compared to water quality predictions in the 2018 Whale Tail FEIS Addendum. These are the only downstream lakes for which both model predictions and monitoring results are available. In previous CREMP/PEAMP assessments (2019), model results were only available for Mammoth Lake, according to the 2016 FEIS.

Exceedances of FEIS water quality model predictions are noted in Table 12-23, and a full discussion is provided in Section 12.5.1.2.2.

Table 12-23 Predicted and measured impacts to surface water quality for the Whale Tail Site during the construction and operations period (primary pathways according to FEIS Addendum Section 3, Table 3-C-6). Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.5.1.2.2. *FEIS Addendum, Appendix 6-H – as described in Section 6.2.3.3.1, these are expected to be accurate within an order of magnitude. **Appendix G of the 2020 CREMP Report. * FEIS Addendum Section 6.2.3.3.2.1.**

Effects Pathway	FEIS/FEIS Addendum Proposed Monitoring	Current Monitoring	Predicted Impact	Measured Impact	
				2019	2020
Project footprint, which will physically alter watershed areas and drainage patterns, rates and quantities of diverted non-contact water to new watersheds, change downstream flows through flooding and dewatering, water levels, channel/bank stability in streams, and disturb lakes and may affect water quality and sediment quality	Dike Construction and Monitoring Plan (FEIS Addendum – Construction Phase only)	Water Quality Monitoring Plan for Dike Construction and Dewatering	Dewatering effluent: <NWB criteria***	Dewatering effluent: mostly < NWB criteria – see discussion, Section 12.5.1.2.2	Dewatering effluent: < NWB criteria
Water management activities (dams, drainage, diversion, discharge, and dewatering) that will alter natural drainage paths and create a reservoir may cause a change in mercury cycling and bioaccumulation					
Activities from construction activities and mining operations (e.g., equipment, vehicles, buildings, open-pit mining, blasting) can create fugitive dust emissions and subsequent dust deposition may cause a change in water quality	CREMP	CREMP (inc. Mercury Monitoring Plan)	Receiving environment comparable to FEIS water quality model predictions* Total Mercury** - WTS: 5.21 ng/L MAM: 8.43 ng/L	Receiving environment comparable to FEIS water quality model predictions Total Mercury: NM (see 2019 CREMP Report)	Receiving environment generally comparable to FEIS water quality model predictions– see discussion, Section 12.5.1.2.2 Total Mercury** - WTS: <5.21 ng/L MAM: <8.43 ng/L
Activities from construction activities and mining operations (e.g., equipment, vehicles, buildings, open-pit mining, blasting) can alter air and dust emissions (including sulphur dioxide, nitrogen oxides, and particulate matter) and subsequent deposition may cause a change in water quality					
Release of treated mine effluent (including sources from sewage, WRSF pond, and attenuation pond contact) may cause changes to surface water quality and sediment quality (i.e., nutrient and metal concentrations) in Mammoth Lake in operations and closure.	Water Quality and Flow Monitoring Plan	Water Quality and Flow Monitoring Plan	Effluent <NWB criteria***	Effluent <NWB criteria – see discussion, Section 12.5.1.2.2	
Dewatering of waterbodies may change flows, water levels, channel/bank stability, and water quality (e.g., suspended sediments, nutrients, metals) in receiving and downstream waterbodies.					

12.5.1.2.2 Parts 3 & 4: Discussion

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), or require further explanation, a discussion is provided here.

12.5.1.2.2.1 MDMER/NWB Compliance Monitoring for Effluent Discharge and Dike Construction

In 2019, water quality compliance monitoring in accordance with MDMER and NWB criteria was conducted for effluent discharge and dike construction, with results as summarized below.

Among these programs, four water quality samples exceeded MDMER and/or NWB Water License criteria. All were for TSS or turbidity in dewatering effluent from Whale Tail North basin. This low number of exceedances is not expected to constitute a significant departure from overall FEIS predictions of water quality. Whale Tail North basin dewatering occurred between March and December, 2019, with discharge to Whale Tail South basin and Mammoth Lake. During daily water quality monitoring, four isolated incidents arose when individual TSS or turbidity concentrations exceeded the MDMER grab sample maximum and/or NWB Type A Water License criteria for the short-term maximum (STM). The NWB Maximum Monthly Mean (MMM) was not exceeded for any parameter. Based on standard operating procedures identified in the Water Quality Monitoring for Dike Construction and Dewatering Plan, supplemental management actions were not required.

In 2020, dewatering of the Whale Tail North basin to Whale Tail South continued from January – May, Quarry 1 was discharged to Mammoth Lake in April, Attenuation Pond discharge to Mammoth Lake occurred in May – October, and to Whale Tail South in May - December. No exceedances of MDMER/NWB water license criteria occurred

12.5.1.2.2.2 Receiving Environment Water Quality Predictions

Within the receiving environment where water quality monitoring is conducted, impact predictions in the form of water quality models are available for Mammoth Lake (2019, 2020), and WTS (2020).

In the 2020 CREMP Report (Appendix 33), monthly mean results for water quality parameters were screened against monthly FEIS Addendum predictions for Mammoth Lake and WTS. This is different to 2019 when annual means were compared.

In total, 18 parameters exceeded specific monthly predictions for at least one month in 2020 (Table 5-7 of the CREMP Report), and concentrations for those parameters are shown in Table B2-2 and B2-3 of the 2020 CREMP Report (Appendix 33). As described in Section 6.4.3.3.1 of the FEIS Addendum, these model predictions are estimated to be accurate within an order of magnitude. While some parameters exceeded exact model outputs in 2019 and 2020, only manganese in WTS exceeded that 10x range of uncertainty (2020 only). However, concentrations did not exceed the CREMP trigger value, and therefore, following the intent of the FEIS magnitude ratings, results for manganese would be considered consistent with a “low” magnitude of impact, because measured values regularly exceed baseline concentrations but are below concentrations associated with adverse effects.

Overall, the FEIS predicted the magnitude of potential effect on water quality in each of the lakes would be *low* (<1x CCME WQG) for all parameters except for total phosphorus which was *medium* (1 to 10x CCME WQG). Results to date therefore indicate that overall, impact predictions for water quality in Whale Tail South and Mammoth Lake are not being exceeded.

12.5.1.2.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management

Effectiveness of Monitoring

Based on the results in Table 12-23 and discussed above in Section 12.5.1.2.2, current monitoring programs are able to address all FEIS impacts for which monitoring was recommended (i.e. monitoring is considered effective).

Effectiveness of Mitigation

A summary of the FEIS-planned mitigation measures for surface water quality, along with a commentary on implementation in 2020 is provided in Table 12-24. Mitigation measured related to water quantity, and fish and fish habitat are provided in Sections 12.5.1.1.3 and 12.5.1.3.3, respectively, though some overlap may occur.

Table 12-24 Mitigation measures described in the Whale Tail FEIS Addendum to reduce impacts of the project on surface water quality during the construction and operations phases, and commentary on current implementation.

Project Activity	Planned Mitigation Measure (FEIS Addendum, Section 3, Table 3-C-6)	Implementation (2020)
Whale Tail Pit Infrastructure Footprint (e.g. open pits, site roads, access roads)	Erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, sloping of banks), where needed.	**Yes** – Erosion Management Plan
	Regular road inspections to check for ponding.	**Yes** – Site inspections
	Monitoring during activities and use of adaptive management where necessary.	**Yes** – Site inspections
	Pumped water from the dewatered waterbodies will be directed through properly designed structures to the lake environment, and not to lake outlets, to prevent erosion in the receiving waterbodies and to attenuate flows.	**Yes** – Water Management Plan
	During dewatering activities, TSS will be monitored, and if necessary, treated before release downstream.	**Yes** – Dike construction Dewatering monitoring plan
Site Water Management (drainage and diversions)	Water that does not meet discharge criteria will be treated prior to discharge into Mammoth Lake.	**Yes** – Water Management Plan
	A Water Management Plan has been developed and describes designs to reduce changes to local flows, drainage patterns, and drainage areas (adherence to Water Management Plan)	**Yes** – Water Management Plan
	Use of turbidity curtains during dike construction to limit disturbance to lakes and waterbodies	**Yes** – Dike construction Dewatering monitoring plan
	Monitoring during activities and use of adaptive management where necessary.	**Yes** – Water Management Plan
	Use of the Dewatering Dikes, Operations, Maintenance and Surveillance Manual developed by Agnico Eagle.	**Yes** – Dike construction Dewatering monitoring plan
Earthworks: Drilling, blasting and excavation (includes Quarry/Borrow Pit) and Crushing activities for the haul road and Whale Tail Pit development	Where possible, stockpiling of rock and fill from quarries and borrow sites will be placed such that surface water is not diverted through the piles with runoff to surface waterbodies; drainage from quarries will not flow directly into any waterbodies or watercourses.	**Yes** – Erosion Management Plan
	When there is seepage from a quarry that could enter a waterbody, a water quality sample will be collected and analyzed.	**Yes** – Site inspections
	Quarries will be inspected on a regular basis to	**Yes** – Site inspections

Project Activity	**Planned Mitigation Measure** (FEIS Addendum, Section 3, Table 3-C-6)	**Implementation (2020)**
	monitor water ponding, particularly at spring melt.	
	Best management practices for erosion and sediment control.	**Yes** – Erosion Management Plan
Site Water Management along the road (seepage and runoff)	Use of non-acid generating material at any watercourse crossings. Testing will verify lack of acid rock drainage and metal leaching potential. Testing will continue on new sources identified for road building.	**Yes** – Operational ARD-ML sampling and testing plan
	Road contact water will be monitored during construction.	**N/A**
Mining and supporting infrastructure for the Whale Tail Pit and haul road	Implement dust control measures, if needed on mine roads.	**Yes** – Air Quality and Dustfall Monitoring Plan
	Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase	**Yes**
	Enforcing speed limits (maximum speed 50 km/h) to suppress dust production.	**Yes** – Road logs
	If deemed necessary through monitoring, dust from roads will be managed through use of dust suppressant.	**Yes** – Air Quality and Dustfall Monitoring Plan
	The running surface of the road will be maintained thereby reducing the generation of dust.	**Yes** – Road maintenance
	Adherence to the Air Quality and Dustfall Monitoring Plan	**Yes** – Air Quality and Dustfall Monitoring Plan
	Most personnel arriving at or leaving the site will be transported by bus, thereby reducing the amount of traffic (and dust).	**Yes**
	Construction equipment and trucks will be equipped with industry-standard emission control systems.	**Yes**
	Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase	**Yes** – Air Quality and Dustfall Monitoring Plan
	Exhaust emissions from non-road vehicles will be managed through regular and routine maintenance of vehicles.	**Yes** – Air Quality and Dustfall Monitoring Plan
	SO2 emissions from non-road vehicles and stationary equipment will be reduced through the use of low emission diesel fuel.	**Yes**
	Adherence to existing air quality monitoring plan to detect changes in air quality	**Yes** – Air Quality and Dustfall Monitoring Plan
	Adherence to water quality monitoring and adaptive management in the CREMP to detect changes in water quality	**Yes** - CREMP
Dike Construction	Erosion and sediment control measures will be implemented during dike construction, where appropriate (e.g., installation of silt curtains for turbidity control)	**Yes** – Dike construction Dewatering monitoring plan
	The dike will be constructed using non-potentially acid-generating rock or low potential for metal leaching material	**Yes** – Dike construction Dewatering monitoring plan
	Adherence to the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering, including installation of turbidity curtains and monitoring.	**Yes** - Water Quality Monitoring and Management Plan for Dike Construction and Dewatering
Development of Supporting Infrastructure for Whale Tail Pit and the haul road	Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks), where needed to limit disturbance to lakes.	**Yes** – Erosion Management Plan
	In-stream works will be constructed in winter, when possible, to avoid increased TSS and turbidity, and	**Yes** - Water Quality Monitoring and

Project Activity	Planned Mitigation Measure (FEIS Addendum, Section 3, Table 3-C-6)	Implementation (2020)
	changes to water and sediment quality.	Management Plan for Dike Construction and Dewatering
	Where applicable, construction runoff will be captured and managed to minimize suspended solids.	**Yes** – Erosion Management Plan
	Regular road inspections to check for ponding.	**Yes** – Site Inspections
Mine Site Operations and Maintenance, including the use of existing infrastructure at Meadowbank Mine and the haul road	Best management practices for erosion and sediment control (e.g., silt curtains, runoff management) will be implemented, as needed to limit disturbance to lakes.	**Yes** – Erosion Management Plan
	Water Management Plan is approved and adhered to at existing facilities and Water Management Plan specific to the Whale Tail Pit areas has been developed and these plans have considered the containment and management of contact site water	**Yes** – Water Management Plan
	Runoff and seepage from the Project site will be diverted to sumps and attenuation ponds (and treated if required), prior to release	**Yes** – Water Management Plan
	Water quality in attenuation ponds will be monitored and managed such that the discharge meets discharge limits	**Yes** – Water Management Plan
	Any potentially acid generating (PAG) or high metal leaching waste rock will be segregated at source and placed into designated areas within the waste rock storage facility	**Yes** - Mine Waste Rock Management Plan
	Adherence to the Operational ARD/ML Testing and Sampling Plan and the Mine Waste Rock and Tailings Management Plan	**Yes** - Operational ARD/ML Testing and Sampling Plan
Construction and operation of roads	Regular road inspections to check for ponding	**Yes** – Site Inspections
	Removal of snow at the culvert inlet prior to freshet.	**Yes** – Freshet Action Plan
Development of Supporting Infrastructure for Whale Tail Pit and the haul road	Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts to alleviate the risk.	**Yes** – Freshet Action Plan
Site Water management: Seepage and Runoff	A Water Management Plan has been developed and describes the containment and management of contact water on-site	**Yes** – Water Management Plan
	Seepage will be captured at sumps and diverted to the Attenuation Pond.	**Yes** – Water Management Plan
	Facility discharge water will be monitored for water quality, and treated as required, prior to discharge	**Yes** – Water Management Plan
	Performance of the dikes will be monitored and appropriate remediation applied, if required	**Yes** – Water Management Plan
Fuel Storage and use (includes Chemical and Hazardous material Storage and Explosives Storage Area)	The Spill Contingency Plan will be implemented, including ready access to an emergency spill clean-up kit for cleaning up any spills.	**Yes** – Spill Contingency Plan
	Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers and will be stored at the Meadowbank Mine.	**Yes** – Hazardous Management Plan
	Storage tanks (e.g., fuel, engine oil, hydraulic oil, and waste oil and coolant) will be double walled, or located in lined and bermed containment areas	**Yes** – Best practices
	Hazardous wastes will be temporarily stored at Whale Tail Pit and then transported to the Meadowbank Mine in appropriate containers to prevent exposure until they are shipped off site to an approved facility.	**Yes** – Hazardous Management Plan
	Individuals working on site and handling hazardous materials will have appropriate training (e.g. WHMIS)	**Yes** – Hazardous Management Plan
	Soils from petroleum spill areas will be deposited at	**Yes** – Landfarm

Project Activity	Planned Mitigation Measure (FEIS Addendum, Section 3, Table 3-C-6)	Implementation (2020)
	the Meadowbank Mine Landfarm	Management Plan
	Equipment will be re-fueled, serviced, or washed away from the watercourse crossings	**Yes** – best practices
	Fuel, lubricants, hydraulic fluids, and other chemicals will be stored at least 31 m away from the high water mark of any waterbody.	**Yes** – Hazardous Management Plan
	Construction equipment will be regularly maintained	**Yes** – Maintenance logs
	Emergency spill kits will be available wherever toxic materials or fuel are stored and transferred	**Yes** – Spill Contingency Plan
	Enforced speed limits	**Yes**
Mining Activities and Water Management	Adherence to Water Management Plan	**Yes** – Water Management Plan
	Treated sewage will be piped to the attenuation pond	**Completed**
	Water quality in attenuation ponds will be monitored and managed such that the discharge entering Mammoth Lake meets Type A Water Licence discharge limits. If water quality does not meet discharge limits, it will be circulated and re-treated.	**Yes** – Water Management Plan
	Other applicable design features and mitigation, as outlined in the Interim Closure and Reclamation Plan	**Yes** - Interim Closure and Reclamation Plan
Water Management Infrastructure, including existing infrastructure that will be used the Meadowbank Mine site, the haul road, and the Whale Tail Pit	Manage pumping rates so total annual discharge from Whale Tail and Nemo Lake does not drop below the 10-year dry condition	**Yes** – Water Management Plan
	Water withdrawal rate(s) will be controlled to avoid effects on the source water lake(s).	**Yes** – Water Management Plan
	Capture and reuse site water to reduce fresh water requirements	**Yes** – Water Management Plan
	During dewatering activities, TSS will be monitored, and if necessary, treated before release downstream	**Yes** – Dike construction Dewatering monitoring plan
	Pumped water from the dewatered waterbodies will be directed through properly designed structures to the lake environment, and not to lake outlets, to prevent erosion in the receiving waterbodies and to attenuate flows.	**Yes** – Dike construction Dewatering monitoring plan
	Erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, sloping of banks), where needed	**Yes** – Dike construction Dewatering monitoring plan
Open Pits	Groundwater inflow to the pits or other dewatered areas will not be directly released to local watersheds	**Yes** – Groundwater Management plan
	All pit water will be pumped to the Attenuation Pond for management and treated prior to release	**Yes** – Water Management Plan
	Mined-out pit flooding will be augmented by fresh water diversion	**Yes** – Water Management Plan

<u>Adaptive Management</u>

Since no significant exceedances of FEIS predictions occurred for water quality programs in 2021, no new adaptive management measures are planned at this time based on this PEAMP analysis.

12.5.1.3 *Fish and Fish Habitat*

12.5.1.3.1 Parts 1 & 2: Summary of Predicted and Measured Residual Impacts

The FEIS for the Whale Tail Pit Project and FEIS Addendum for the Whale Tail Pit Expansion Project assessed potential direct and indirect effects to fish and fish habitat as a result of Project activities.

Residual impacts were associated with dike construction, lake dewatering, water diversion (terrestrial flooding), pit re-flooding, and effluent discharge. A summary of predictions for residual impacts to fish and fish habitat (FEIS Volume 6, Section 6.5, as summarized in Volume 3, Table 3-C-7; FEIS Addendum Section 6.5, as summarized in Table 3-C-7) and the accuracy of these predictions in 2019 and 2020 (measured impacts) are provided in Table 12-25. Cells are highlighted in grey when measured impacts exceed predictions for the current year. Future results will be added to that section to ensure historical trends can be observed, even when predicted impacts are not exceeded in a given year.

Table 12-25 Predicted and measured impacts to fish and fish habitat for the Whale Tail Site during the construction and operations period (primary pathways according to FEIS and FEIS Addendum Tables 3-C-7). *Effects Pathways added for the Expansion Project are in italics.* NA = not assessed. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.5.1.3.2. *FEIS values differ slightly from those calculated under the Whale Tail Pit Fish Habitat Offsetting Plan (March, 2018).

Effects Pathway	FEIS Proposed Monitoring	Current Monitoring	Predicted Impact		Measured Impact	
					2019	2020
Direct Effects						
The construction of the Northeast, Whale Tail, and Mammoth dikes, and Whale Tail Pit, and the dewatering of the diked area in Lake A17 (Whale Tail Lake) and Lake A16 (Mammoth Lake) will result in the direct loss or alteration of fish habitat.	None	As-built Reports for Mammoth and Whale Tail Dike	*FEIS values* (in-water footprints during operations phase, with assumed baseline water elevations)*: Mammoth Dike: 0.07 ha Mammoth Lake dewatering: 0.93 ha (TBD masl) Whale Tail Dike: 3.98 ha Whale Tail dewatering: 64.58 ha (152.5 masl)	*Offsetting Plan values* (Portt & Associates, 2018; footprints during operations phase, with baseline water elevations)*: Mammoth Dike area above water + dewatering: 1.2 ha (152.57 masl) Whale Tail Dike area above water + dewatering: 69.5 ha (153.02 masl)	NA – to be calculated following completion of the as-built reports (est. 2020)	NA – to be calculated in 2021. See discussion Section 12.5.1.3.2.
The dewatering of smaller waterbodies and watercourses in the northeast area to permit construction of the IVR Pit and WRSF for the Expansion Project, and the dewatering of and use of Lake A53 as the IVR Attenuation Pond for the Expansion Project, will result in the direct loss or alteration of fish habitat.	None	As-built Reports for IVR Pit, WRSF, Attenuation Pond	*FEIS Addendum values* (Section 6.5.4.2.2): total losses of 7.9 ha of lake/pond area; 1,155 m of stream length	*Offsetting Plan values* (ERM, 2020 – Table 7-1): Total area of 26.01 ha (inc. watercourses, excl. Whale Tail Lake)	NA	NA – to be calculated following completion of the as-built reports (est. 2026). See discussion Section 12.5.1.3.2.

Effects Pathway	FEIS Proposed Monitoring	Current Monitoring	Predicted Impact		Measured Impact	
					2019	2020
Water diversions for the Whale Tail and Northeast dikes during construction and operations will flood tributary lakes and streams, and will result in the alteration of habitat. *Extension of flooding period for Whale Tail South due to the Expansion Project.*	None	Water level monitoring & surface area calculation	***Northeast Flood Zone*** *FEIS operations phase prediction (2019):* Lake A46: +3.5 m to 34 ha, consuming lakes A47, A48, A113, Pond A-P38, and Pond A-P68 including 412 m of flooded streams. *FEIS Addendum operations phase prediction (2020+):* Dewatered to permit construction of IVR Pit	***Northeast Flood Zone*** *Offsetting Plan(s) operations phase assumption:* Northeast flood zone is assumed lost fish habitat.	Flooded to +3.5 m prior to pumping. See Water Quantity discussion, Section 12.5.1.1.2	Dewatered to permit construction of IVR Pit. See Water Quantity discussion, Section 12.5.1.1.2
			Whale Tail South Flood Zone *FEIS Addendum operations phase prediction (2020+):* +3.5 m (to 156 masl); surface area increase from 369 ha (all flood zone lakes) to 513 ha, consuming Lakes A18, A19, A20, A21, A22, A55, A62, A63, A65, Pond A-P1, and Pond A-P53. 1988 m of stream habitat flooded.	***Whale Tail South Flood Zone*** *Offsetting Plan(s) operations phase assumption:* +3.5 m (to 156 masl), resulting in 130.9 ha of flooded terrestrial zone. However, this temporary habitat was not considered part of offsetting.	NA – flooding not complete in 2019	See discussion, Section 12.5.1.1.2.1
The dewatering of the diked area in Lake A17 (Whale Tail Lake) and Lake A16 (Mammoth Lake) *and smaller waterbodies in the northeast*	None	2018 Whale Tail Lake Fishout Report 2020 Whale Tail	***Whale Tail Lake est. loss:*** 870 kg or 3346 fish ***IVR area waterbodies est. loss:*** A46 – 2.9 kg		***Whale Tail Lake loss:*** 776.6 kg or 3078 fish	***IVR area waterbodies loss:*** A46 – 0.56 kg A47 – 2.4 kg A48 – 4.3 kg

Effects Pathway	FEIS Proposed Monitoring	Current Monitoring	Predicted Impact	Measured Impact	
				2019	2020
area for the Expansion Project will result in the removal and subsequent mortality of fish from the area during the proposed fish-out.		Expansion Project Fishout Report	A47 – 43.2 kg A48 – 1.2 kg A49 – 23.5 kg A53 – 125.5 kg A0 – 0.4 kg A-P38 – 1.2 kg **TOTAL = 197.9 kg**		A49 – 6.5 kg A53 – 55.7 kg A0 – 0.30 kg A-P38 – 0 kg A50 = 0 kg A51 = 0 kg A52 = 0 kg **TOTAL = 69.8 kg**
Indirect Effects					
The construction of the North-East, Whale Tail, and Mammoth dikes will alter access to tributary streams and lakes (i.e., habitat connectivity) in the LSA, and may result in habitat loss for Lake Trout, Arctic Char, and Round Whitefish.	None	Fish Habitat Offsetting Plan – Complementary Measures	Minor effect on fish populations (not quantified).	NA (post-flooding hydroacoustic survey planned prior to drawdown)	
During the construction of the Whale Tail, Mammoth, and WRSF dikes, water diversions will result in a reduction of water levels in Lake A16 (Mammoth Lake) and downstream locations, affecting fish and fish habitat.	Water level monitoring	Water level monitoring	Change in Mammoth Lake mean monthly water level from baseline during open water: Construction: up to -0.16 m Dewatering: up to -0.12 m Operations: up to +0.05 m Moderate effect to population abundance and distribution of VC fish species during dike construction and closure phases.	Mammoth Lake water levels within baseline (see Section 12.5.1.3.2)	
Release of treated mine effluent (including sources from sewage, WRSF pond, and attenuation pond contact) may change trophic status in Mammoth Lake, *Whale Tail Lake, and downstream waterbodies* in operations and closure.	Total phosphorus (CREMP)	CREMP	**Total phosphorus:** >mesotrophic trigger (10-20 µg/L) in Mammoth Lake, to a max. of 29 µg/L (2021). Within mesotrophic trigger range (10-20 µg/L) in WTS to a max. of 20 µg/L (2026).	Below predicted concentrations.	Within or below predicted trophic range, but some exceedances of monthly predictions. See discussion Section 12.5.1.3.2, below.
			Phytoplankton: Increase in phytoplankton biomass and possibly altered species composition in Mammoth Lake, Whale Tail Lake, A15, A12, A76 and potentially further downstream to DS1.	Increase in phytoplankton biomass.	Non-significant increases and decreases in phytoplankton biomass. Significant

Effects Pathway	FEIS Proposed Monitoring	Current Monitoring	Predicted Impact	Measured Impact	
				2019	2020
					reduction in taxa richness in WTS. See discussion, Section 12.5.1.3.2, below.
		None	**Zooplankton**: Increase in secondary production (zooplankton) and altered species composition in Mammoth Lake and downstream lakes.	NA	
		CREMP	**Benthic Invertebrates**: Possible delayed increase in benthic invertebrate abundance and biomass.	No mine-related impacts on benthic invertebrate community.	
		Fish Habitat Offsetting Plan – Complementary Measures	**Fish**: Possible increase in forage fish abundance; possible minor increase in growth and reproduction rates for large-bodied fish (not measurable).	Research study underway as described in the 2020 Fish Habitat Offset Monitoring Report (Appendix 44) (complete results planned for 2022)	

12.5.1.3.2 Parts 3 & 4: Discussion

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), or for pathways where further details are warranted, a discussion is provided here.

Most quantitative FEIS and FEIS Addendum predictions for impacts to fish and fish habitat were for changes to habitat areas and direct loss of biomass as a result of the dewatering and fishout of Whale Tail Lake North and the IVR Pit area.

12.5.1.3.2.1 Habitat Losses

Predicted direct habitat losses for the Whale Tail North area were calculated as the in-water footprints of the Mammoth and Whale Tail Dikes, plus the dewatered area between them (Whale Tail North and Mammoth Lake). The validity of these predictions can be assessed by comparing as-built dike footprint area to the footprint from FEIS and offsetting plan designs, taking the assumed baseline water level into account. Construction summary reports (as-built designs) were finalized in November, 2020, and these comparisons will be completed in 2021.

For the IVR area, habitat losses were calculated in the FEIS Addendum as the area of affected waterbodies and length of affected watercourses. For the associated offsetting plan (ERM, 2020), losses were calculated as a total area, including waterbodies and watercourses. Eventual as-builts for the IVR Pit, IVR WRSF and IVR Attenuation Pond will be reviewed to generally confirm the footprint of those facilities impacts waterbodies as predicted (est. 2026).

12.5.1.3.2.2 Mammoth Lake and Downstream Water Levels

FEIS and FEIS Addendum predictions indicated that "*during the construction and operations of the Whale Tail, Mammoth, and WRSF dikes, water diversions will result in a reduction of water levels in Mammoth Lake and downstream locations, affecting fish and fish habitat*" (FEIS Addendum, Section 6.5.4.3).

The predicted change in water levels is summarized in Section 12.5.1.1.2.2 (Mammoth Lake Water Level). Quantitative predictions were provided in the FEIS and FEIS Addendum for % change in discharge from Mammoth Lake and change in water levels in Mammoth Lake compared to baseline conditions for the various project phases (construction, dewatering, operations, closure). Discharges and water levels were expected to be slightly reduced at Lake A5, and changes were not expected to be measurable at Lake DS1, so the evaluation focused on Mammoth Lake. Modelled declines in water levels during the construction and closure phases (up to 0.2 m reduction in mean monthly lake level) were predicted to result in a "*moderate effect to population abundance and distribution*" of VC fish species.

Since this qualitative determination of impacts to fish and fish habitat was based on predicted changes to water levels, it can be assessed through a comparison of measured water levels in the impacted system (Mammoth Lake) with the FEIS model predictions. Complete results for water level monitoring in Mammoth Lake are provided in Section 12.5.1.1.2.2. Measured baseline data is only available for three time points in 2015, and the mean monthly baseline values used in FEIS hydrological model were not specified. As a result, quantitative comparison is difficult. However, to date, measured water levels have not declined below baseline values measured in 2015 .

12.5.1.3.2.3 Lake Ecosystem Productivity

Since residual impacts on fish and fish habitat due to changes in lower trophic levels were predicted, but those predictions were not quantitative, a discussion is provided here.

Predicted impacts to fish and fish habitat associated with changes in lower trophic levels stem from a predicted increase in nutrient concentrations due to water management and effluent discharge. Increased phytoplankton biomass and possibly altered species composition was predicted but not quantified for Mammoth Lake, Whale Tail Lake, A15, A12, A76 and potentially further downstream to DS1.

Phosphorus concentrations were predicted in the FEIS Addendum to increase briefly beyond the CCME mesotrophic range (10 - 20 µg/L) during the operations phase in Mammoth Lake, to a maximum of 29 µg/L (in 2021). Concentrations were predicted to be largely within the mesotrophic range for WTS during operations, to a maximum of 20 µg/L (in 2026). Predicted and measured values are shown in Figure 65, below. In 2019 and 2020, concentrations of nutrients were generally elevated compared to baseline values in Mammoth Lake and WTS (2020 CREMP Report, Section 5.3.2). While some measurements of phosphorus exceeded monthly FEIS predictions (particularly in WTS; Figure 65 below), all were within an order of magnitude (the level of uncertainty assigned to these predictions in the FEIS), and overall concentrations were below or within predicted trophic levels.

In 2019, there was a statistically significant increase in annual average phytoplankton biomass in Whale Tail South and a notable, but not statistically significant, increase in Mammoth Lake (Figure 66, below), relative to baseline/reference conditions. While biomass was higher than seen during baseline monitoring, the apparent increases were also driven by lower biomass at the reference area (INUG) relative to previous years. Thus, the biomass results for 2019 appeared due to the combined influence of natural variability and mining-related activities. In 2020, there were no statistically significant changes to phytoplankton biomass.

As predicted in the FEIS as a possibility, a statistically significant decrease in phytoplankton taxa richness was observed for WTS in 2020 for the first time, but not for other lakes. However, given that 2020 was the first year with a significant decrease in richness at WTS, there is uncertainty as to whether this is a mine-attributable effect, or is the result of natural variation. Monitoring in 2021 will help to determine causation.

No significant mine-related changes in benthic invertebrates were observed in 2019 or 2020, although FEIS predictions indicated impacts may be delayed.

Potential impacts on forage fish that were also predicted to occur are being assessed through a research study agreement with the University of Waterloo. Those results are expected in 2022.

Overall, FEIS predictions for changes to lower trophic levels were not quantitative, but nutrient concentrations have increased for near-field lakes and associated primary production shifts may be occurring, as anticipated.

Figure 65. Total phosphorus in water samples from Whale Tail study area lakes since 2014. Red dashed line indicates CREMP trigger value. Blue dashed line indicates FEIS Addendum model prediction. The detection limit was adjusted for some July 2020 samples from 0.002 mg/L to 0.010 mg/L or 0.020 mg/L.

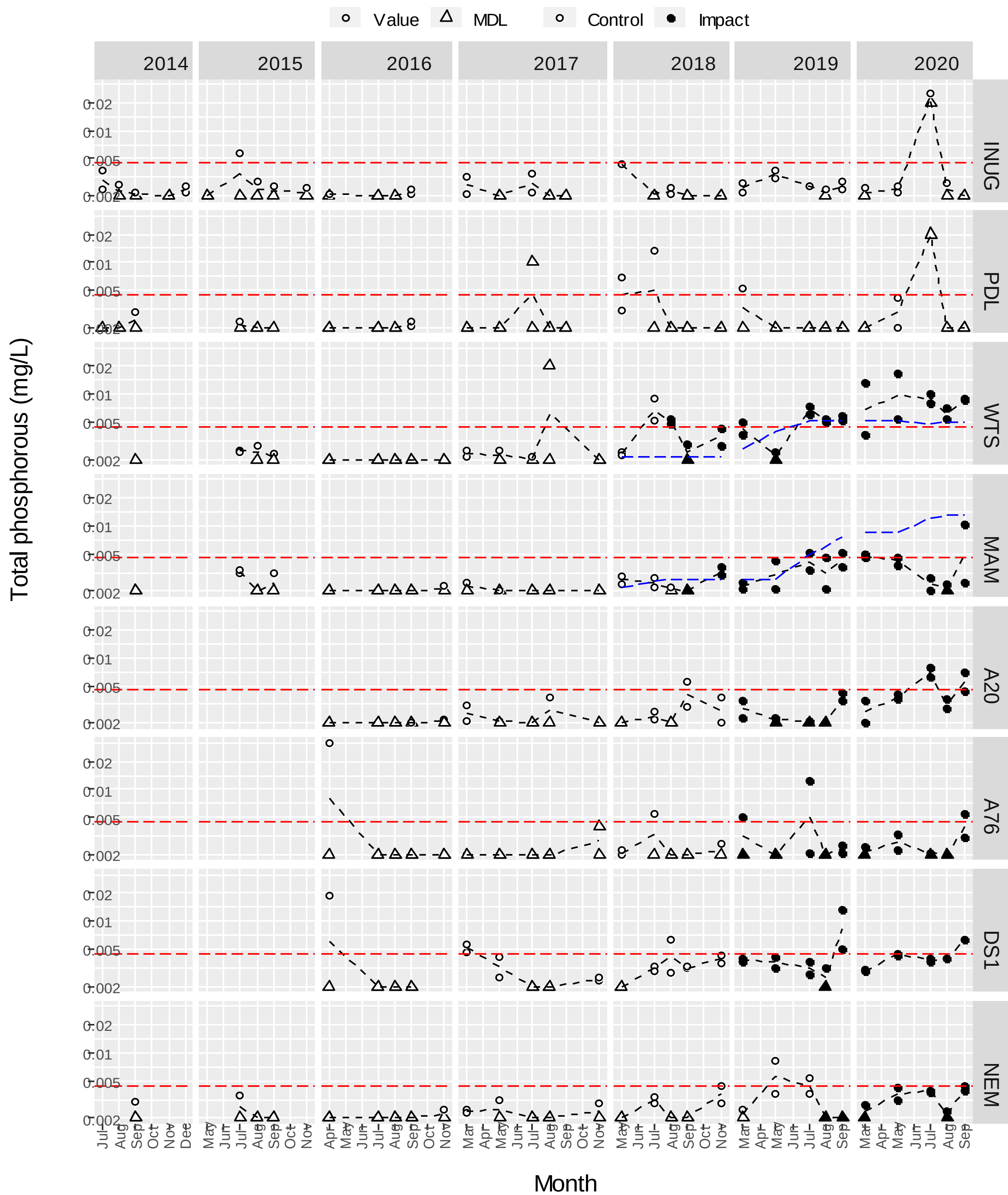
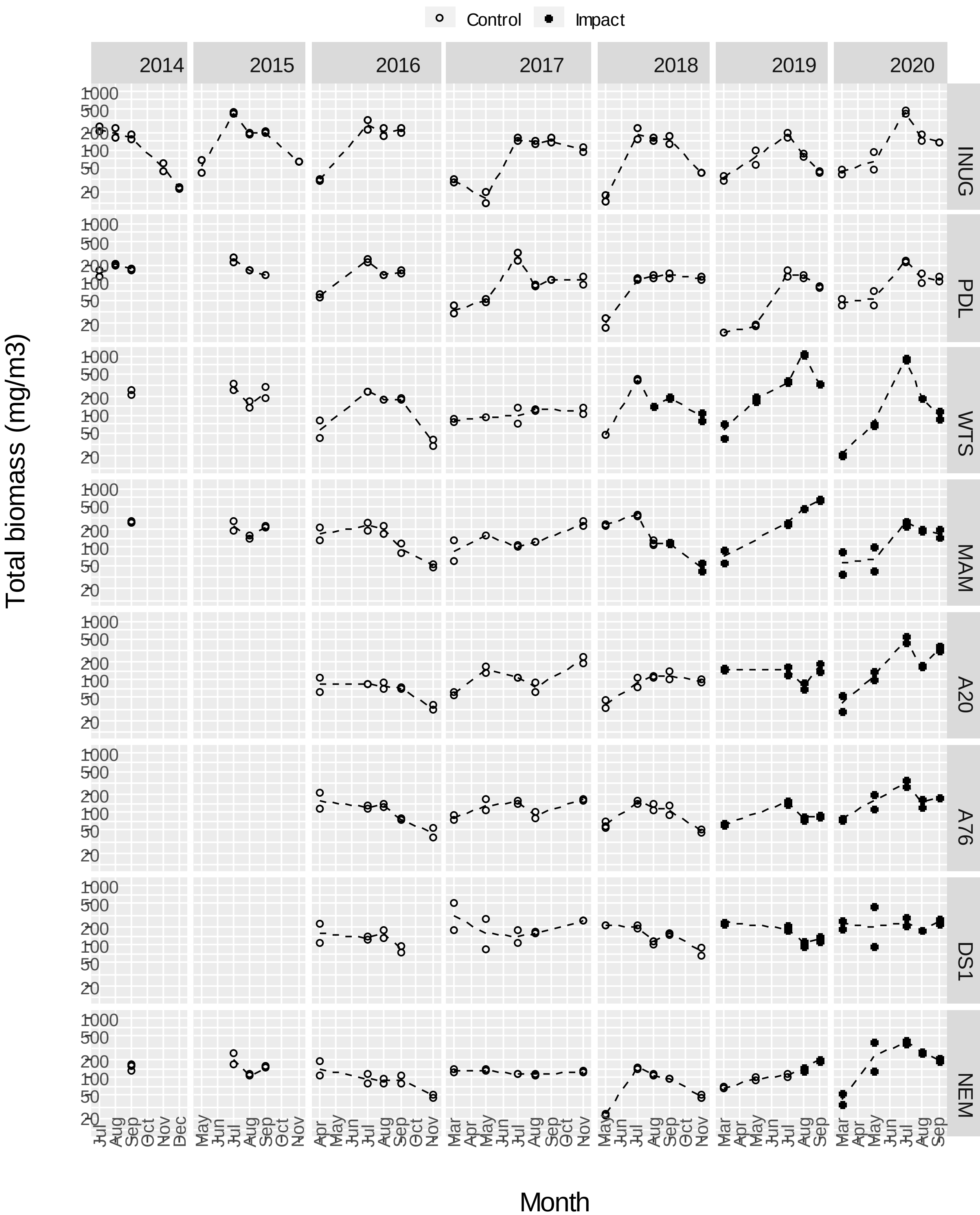


Figure 66. Total phytoplankton biomass (mg/m³) from the Whale Tail Pit study lakes since 2015.



12.5.1.3.2.4 Whale Tail South Flooding

FEIS (2016) predictions indicated that during operations, water levels in Whale Tail South would increase in elevation by 3.5 m (from 152.5 to 156.0 masl) and increase in surface area from 369 ha to 513 ha, resulting in 144 ha of flooding (Volume 6, Section 6.5.3.2). Refined water level modelling in the FEIS Addendum predicted 148.5 ha of flooding at elevation 156.0 masl (FEIS Addendum, Appendix 6-F, Table 6-F-1). The resulting impacts on fish were only assumed to occur at the individual level (access to new habitat). No population-level changes were assumed as a result of this additional aquatic habitat.

Within the Fish Habitat Offsetting Plan for Whale Tail Pit (March, 2018), the calculated expansion of aquatic habitat during operations was 131 ha, which is smaller than FEIS calculations. This is due to differences in assumed baseline water levels (152.5 masl in the FEIS, 153.02 masl in the offsetting plan). Although a potential increase in fish population productivity during the operations phase was noted in this Plan, the flooded terrestrial zone was not assumed to provide fish habitat for offsetting purposes until after drawdown to +1 m above baseline (154.02 masl, from a baseline of 153.02 masl), during the closure phase. This drawdown was planned to occur from 2022 – 2026, and the permanent flooded habitat would occur in Whale Tail Lake only.

No change to these assumptions was presented in the Whale Tail Pit Expansion Project's Fish Habitat Offsetting Plan (ERM, 2020), except the drawdown will not begin until 2026, but will still be completed within the same year. Under this plan, a sill will be constructed between Lake A18 and Whale Tail Lake (South Basin) in 2026 to maintain some of the flooding in upstream areas. The new permanent water level throughout this area would be 155.3 masl, which is 1.3 m above baseline in A18, and 0.3 m above baseline in A22.

Measured water levels in the Whale Tail South flood zone to date are shown in Figure 62a and b, Section 12.5.1.1.2.1. To help preserve integrity of the Whale Tail Dike, construction designs for the South Whale Tail Channel were changed just prior to construction in early 2020. The inlet invert elevation was decreased by 0.5 m from original plans, to an elevation of 155.3 masl. As a result, operational water levels in the Whale Tail South area have been lower than the FEIS prediction of 156.0 masl,. In 2020, measured peak flood levels reached 155.7 masl on June 17, and post-freshet low water levels declined to 155.1 masl on December 27, 2020. These water levels correspond to a terrestrial flood zone range of approximately 73 - 117 ha (FEIS Addendum, Appendix 6-F, Table 6-F-1) which is 14 – 58 ha smaller than the 2018 offsetting plan calculation for the operations period (131 ha). However, as noted above, no offsetting was associated with temporary operations-phase flooding, and the assumptions for permanent habitat creation (post-closure habitat) in both the 2018 and 2020 offsetting plans are still expected to be met once the South Whale Tail Channel is decommissioned, since peak flood levels currently exceed 155.3 masl.

To fulfill conditions of the *Fisheries Act* Authorization 20-HCAA-00275 for the Whale Tail Pit Expansion Project (see Section 8.8.2.2), Agnico will develop a pre-offsetting ecological monitoring program to assess the suitability of flooded areas in Whale Tail South as fish habitat, prior to construction of the A18 sill. This program will be based on the monitoring methods described in the approved Whale Tail Pit Expansion Project Fish Habitat Offsetting Plan (March, 2020), and formally initiated in 2021.

12.5.1.3.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management

Effectiveness of Monitoring

Based on the results in Table 12-25, existing monitoring is able to effectively address all FEIS predictions for changes to fish and fish habitat, with the exception of predicted impacts to zooplankton. The rationale for omitting zooplankton is discussed in the 2019 PEAMP.

Effectiveness of Mitigation

A summary of the FEIS planned mitigation measures related to fish and fish habitat, along with a commentary on implementation in 2020 is provided in Table 12-26. Mitigation measured specifically related to water quantity and water quality are provided in Sections 12.5.1.1.2 and 12.5.1.2.2, respectively, though some overlap may occur.

Table 12-26 Mitigation measures described in the Whale Tail FEIS Addendum to reduce impacts of the project to fish and fish habitat, and commentary on current implementation.

Project Activity	Planned Mitigation Measure (FEIS, Volume 3, Table 3-C-7)	Implementation (2020)
Mine infrastructure footprint	Best management practices for erosion and sedimentation control (e.g., ground cover, silt fences and curtains, runoff management), where needed.	**Yes** – Freshet Action Plan
Site water management (road infrastructure) and Whale Tail Haul Road operation	Where possible, in-stream works will be constructed in winter when watercourses are frozen. In-stream works will be conducted according to DFO timing windows to avoid critical periods for fish.	**Yes** – Winter Construction of SWTC
	Mining staff will not be allowed to hunt or fish while on their work rotation; Agnico Eagle will develop and enforce “no hunting, trapping, harvesting or fishing policy” for employees and contractors, which will be consistent with the Meadowbank Mine.	**Yes**
	Watercourses will be inspected upstream and downstream of the crossings for, erosion, scour, and flow blockages	**Yes** – Road Inspection
	Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts or drains to alleviate risk, where required.	**Yes** – Road Inspection
	Rock aprons at culvert inlets and outlets will provide erosion protection and prevent localized erosion from concentrated high velocity flows above the peak 1:10 year rainfall event.	**Yes** – Road Inspection
	Use of staggered culvert configuration, and removal of snow at the culvert inlet and outlet prior to the freshet to promote drainage and increased conveyance of flow during spring thaw and freshet.	**Yes** – Road Inspection
Earthworks: Drilling, blasting and excavation (includes Quarry/Borrow Pit) and Crushing activities	Only the required amount of explosive will be used as necessary for the amount of rock or borrow material to be blasted	**Yes** – Blast monitoring Plan
	Applicable guidelines for set-back distances and quantities of explosives will be followed.	**Yes** – Blast monitoring Plan
	Where possible, stockpiling of rock and fill from quarries and borrow sites will be placed such that surface water is not diverted through the piles with runoff to surface waterbodies; drainage from quarries will not flow directly into any waterbodies or watercourses.	**Yes** - Mine Waste Rock Management Plan
	Borrow and rock quarry activity will be at least 31 m from the high water mark of any waterbody	**Yes** - Mine Waste Rock Management Plan
	Borrow pits and quarry will be excavated and sloped for positive drainage	**Yes** - Mine Waste Rock Management Plan

Project Activity	Planned Mitigation Measure (FEIS, Volume 3, Table 3-C-7)	Implementation (2020)
	Quarries will be inspected on a regular basis to monitor water ponding, particularly at spring melt.	**Yes** - Mine Waste Rock Management Plan
	Drainage from borrow pits and quarry will not flow directly into any waterbodies or watercourses.	**Yes** - Mine Waste Rock Management Plan
	When there is ponded water in the rock quarry or borrow pits that could enter a waterbody or watercourse, a water quality sample will be collected and analyzed, and the results used to determine appropriate mitigation measures (e.g., prevent runoff from entering waterbody or watercourse).	**Yes** - Mine Waste Rock Management Plan
	To avoid and mitigate Serious Harm to Fish, Agnico Eagle will continue to adhere to blasting requirements and will continue to use practices consistent with those used at the Meadowbank Mine. Agnico Eagle will engage with DFO, when required.	**Yes** – Blast monitoring Plan
	Use of non-acid generating material at watercourse crossings; testing will verify lack of acid rock drainage and metal leaching potential.	**Yes** - Mine Waste Rock Management Plan
	Any PAG or high metal leaching waste rock will be segregated at source and placed into designated areas within the waste rock storage facilities.	**Yes** - Mine Waste Rock Management Plan
General Construction /Decommissioning Activities	Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks), where needed to limit disturbance to lakes and streams.	**Yes** - Mine Waste Rock Management Plan
	In-stream works will be in winter, when possible, to avoid increased TSS and turbidity, and changes to water quality	**Yes**
	Where applicable, runoff from construction / decommissioning activities will be captured and managed to minimize suspended solids (e.g., discharged into an attenuation pond to settle out suspended sediments)	N/A
	Where possible, in-stream works will be constructed in winter when watercourses are frozen. In-stream works will be conducted according to DFO timing windows to avoid critical periods for fish.	**Yes** - Winter construction of SWTC
	Bridge abutment installation will span majority of the active channel (i.e., outside of the high-water mark), and if feasible, construction will occur in winter	N/A – no bridge installation
	Disturbed areas along the streambanks will be stabilized and allowed to revegetated upon completion of work	**Yes** – Streambank allowed to revegetate
Site Water Management	A Surface Water Management Plan will be implemented	**Yes** – Water Management Plan
Dike Construction / Decommissioning causing release of sediment	Use of the Dewatering Dikes, Operations, Maintenance and Surveillance Manual developed by Agnico Eagle.	**Yes** – Water Quality Monitoring Plan for Dike Construction and Dewatering
	Best management practices for erosion and sedimentation control (e.g., ground cover, silt fences and curtains, runoff management), where needed.	**Yes** – Water Quality Monitoring Plan for Dike Construction and Dewatering
	During summer construction, turbidity curtains will be installed near the portion of the alignment where dike construction will occur, which is an approach demonstrated at other northern mining projects	**Yes** – Water Quality Monitoring Plan for Dike Construction and Dewatering
	Non- potentially acid generating, chemically inert material (i.e., granite) will be used to construct the dike to prevent leaching of metals into water.	**Yes** – Water Quality Monitoring Plan for Dike Construction and Dewatering
	Turbidity monitoring will be conducted at designated locations throughout open water and under-ice conditions, within and	**Yes** – Water Quality Monitoring Plan for Dike

Project Activity	Planned Mitigation Measure (FEIS, Volume 3, Table 3-C-7)	Implementation (2020)
	outside of the zone of the turbidity curtains. In the event that TSS concentrations approach monitoring thresholds, a review of local conditions and activities will be conducted.	Construction and Dewatering
General mining activities and use of vehicles causing fugitive dust & other air emissions	Implement dust control measures, if needed on mine roads.	**Yes –** Air Quality and Dustfall Monitoring Plan
	Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase	**Yes –** Air Quality and Dustfall Monitoring Plan
	Enforcing speed limits (maximum speed 50 km/h) to suppress dust production.	**Yes**
	If deemed necessary through monitoring, dust from roads will be managed through use of dust suppressant	**Yes –** Air Quality and Dustfall Monitoring Plan
	The running surface of the road will be maintained thereby reducing the generation of dust.	**Yes –** Air Quality and Dustfall Monitoring Plan
	Adherence to the Air Quality and Dustfall Monitoring Plan	**Yes –** Air Quality and Dustfall Monitoring Plan
	Most personnel arriving at or leaving the site will be transported by bus, thereby reducing the amount of traffic (and dust).	**Yes**
	Adherence to water quality monitoring and adaptive management in the CREMP to detect changes in water quality	**Yes** - CREMP
	Construction equipment and trucks will be equipped with industry-standard emission control systems.	**Yes** - Air Quality and Dustfall Monitoring Plan
	Compliance with regulatory emission requirements will be met.	**Yes –** Air Quality and Dustfall Monitoring Plan
	Exhaust emissions from non-road vehicles will be managed through regular and routine maintenance of vehicles	**Yes** – Maintenance logs
	SO_2 emissions from non-road vehicles and stationary equipment will be reduced through the use of low emission diesel fuel.	**Yes**
Waste Rock Storage Areas and Stockpiles	A Water Management Plan has been developed and describes the containment and management of contact water on-site.	**Yes** – Water Management Plan
	Contact water will be monitored and managed through the Storage and Attenuation Ponds. The IVR Diversion will divert clean runoff from the upper watershed of the IVR Pit to the Nemo Lake watershed.	**Yes** – Water Management Plan
	Seepage will be captured at sumps and diverted to the Attenuation Pond.	**Yes** – Water Management Plan
	Facility discharge water will be monitored for water quality, and treated as required, prior to discharge	**Yes** – Water Management Plan
	Performance of the dikes will be monitored throughout their construction and operating life.	**Yes** – Water Management Plan
Site Water Management	Manage pumping rates so total annual discharge from Whale Tail and Nemo Lake does not drop below the 10-year dry condition	**Yes** – Water Management Plan
	Water withdrawal rate(s) will be controlled to avoid effects on the source water lake(s).	**Yes** – Water Management Plan
	Capture and reuse site water to reduce fresh water requirements	**Yes** – Water Management Plan
	Pumped water from the dewatered lakes will be directed through properly designed structures to prevent erosion in the receiving waterbodies	**Yes** – Water Management Plan
	Pumped discharge will be directed to the lake environment, and not directly to outlets, to attenuate flow changes	**Yes** – Water Management Plan
	Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, sloping of banks), where needed	**Yes** – Water Management Plan
	Water Management Plan will be implemented	**Yes** – Water Management Plan

Project Activity	Planned Mitigation Measure (FEIS, Volume 3, Table 3-C-7)	Implementation (2020)
	A fish-out of the diked area of Whale Tail and Mammoth lakes, and smaller waterbodies in the northeast area for the Expansion Project, will be conducted before and during dewatering phase; the fish-out plan will be designed and implemented in consultation with DFO and local Inuit communities, and will consider recommendations in Tyson et al. (2011).	**Yes** – 2020 Fishout Plan
	Appropriately sized fish screens, which meet DFO guidelines, will be fitted to pumps to limit fish access and to limit fish entrained to the smaller species and life stages	**Yes** – Water Management Plan
	Runoff and seepage from the Project site will be diverted to sumps and the attenuation pond (and treated if required) prior to release.	**Yes** – Water Management Plan
	Water quality in attenuation ponds will be monitored and managed such that the discharge meets discharge limits.	**Yes** – Water Management Plan
	Potential acid generating rock and metal leaching waste rock will be segregated at source and placed into designated areas within waste rock locations	**Yes** – Mine Waste Rock Management Plan
Fuel Storage and use (includes Chemical and Hazardous material Storage and Explosives Storage Area)	The Spill Contingency Plan will be implemented, including ready access to an emergency spill clean-up kit for cleaning up any spills	**Yes** - Spill Contingency Plan
	Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers and will be stored at the Meadowbank Mine.	**Yes** – Hazardous Management Plan
	Storage tanks (e.g., fuel, engine oil, hydraulic oil, and waste oil and coolant) will be double walled, or located in lined and bermed containment areas	**Yes** – Hazardous Management Plan
	Hazardous wastes will be temporarily stored at Whale Tail Pit site and then transported to the Meadowbank Mine in appropriate containers to prevent exposure until they are shipped off site to an approved facility	**Yes** – Hazardous Management Plan
	Individuals working on site and handling hazardous materials will have appropriate training (e.g. WHMIS)	**Yes** – Hazardous Management Plan
	Soils from petroleum spill areas will be deposited at the Meadowbank Mine Landfarm	**Yes** – Landfarm Management Plan
	Equipment will be re-fueled, serviced, or washed away from the watercourse crossings.	**Yes** – Best practices
	Fuel, lubricants, hydraulic fluids, and other chemicals will be stored at least 31 m away from the high water mark of any waterbody.	**Yes**
	Construction equipment will be regularly maintained	**Yes** – Maintenance Logs
	Emergency spill kits will be available wherever toxic materials or fuel are stored and transferred	**Yes** – Spill Contingency Plan
	Enforced speed limits	**Yes**
Mining Activities and Water Management – effluent release	Adherence to Water Management Plan	**Yes** – Water Management Plan
	Runoff and seepage from the Project site will be diverted to sumps and the attenuation pond	**Yes** – Water Management Plan
	Treated sewage will be piped to the attenuation pond	**Completed**
	Water quality in Attenuation Ponds will be monitored and managed such that the discharge entering Mammoth Lake, Whale Tail Lake, or the alternative discharge locations (Lake 1 or Lake 5) meets discharge limits. If water quality does not meet discharge limits, it will be circulated and re-treated.	**Yes** – Water Management Plan

Adaptive Management

No impact predictions for fish and fish habitat have been exceeded to date, so no adaptive management actions are planned at this time.

12.5.2 Vegetation, Terrestrial Wildlife, and Birds

12.5.2.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

The 2020 Wildlife Monitoring Summary Report (Appendix 47) provides a complete assessment of wildlife monitoring programs including a comparison to monitoring thresholds detailed in the Terrestrial Ecosystem Management Plan (TEMP Version 7; 2019) and impacts predicted in the Whale Tail Pit Project FEIS (Agnico Eagle, 2016) and FEIS Addendum for the Whale Tail Pit Expansion Project (Agnico Eagle, 2018). Results are summarized here in the PEAMP format.

For each wildlife VC, a summary of residual predicted impacts and the accuracy of those predictions (observed impacts) as determined through various monitoring programs conducted under the TEMP is provided in Table 12-27. Thresholds for the implementation of adaptive management, as developed in the TEMP (Version 7; 2019) were used in this comparison because most impact predictions in the Terrestrial Ecosystem Impact Assessment of the FEIS (Agnico Eagle, 2016) and FEIS Addendum (Agnico Eagle, 2018) were qualitative only. The 2019 TEMP thresholds were developed in consultation with the Terrestrial Advisory Group (TAG), and represent quantitative measurement endpoints that trigger management action.

Of note is that Table 12-27 below presents only TEMP results for monitoring conducted in relation to predicted residual impacts for the Whale Tail Site. Results for all additional TEMP monitoring endpoints have thresholds that were developed for the Meadowbank Complex, and these results are described in the Meadowbank Terrestrial and Wildlife Environment PEAMP evaluation, Section 12.4.2.

Overall, no TEMP thresholds were exceeded for the Whale Tail site and haul road in 2020.

Table 12-27 Predicted residual impacts to terrestrial environment and wildlife VCs for the Whale Tail Site during the construction and operations period (primary pathways according to FEIS Volume 5, and updated to reflect FEIS Addendum, Section 5.4 and 5.5 as indicated); thresholds according to the Terrestrial Ecosystem Management Plan (Version 7; June 2019); and measured impacts according to the annual Wildlife Monitoring Summary Report (Appendix 47). NM = not required to be measured in the identified year. NA = no threshold.

Effect Pathway	Proposed Monitoring	Current Monitoring	Threshold/ Prediction	Measured Impact	
				2019	2020
VEGETATION (WILDLIFE HABITAT)					
Direct loss and fragmentation of vegetation habitat from the Project footprint	TEMP	TEMP - Ground Surveys, Mapping, GIS Analysis	Predicted/Permitted area + threshold over prediction (Whale Tail site and haul road): 820/1473 ha + 5%	NM (next assessed in 2021)	
Loss or alteration of local flows, drainage patterns (distribution), and drainage areas from the Project footprint and haul road that can cause changes to vegetation	None	TEMP - Ground Surveys, Mapping, GIS Analysis	*FEIS Addendum, Section 5.4.3.1.2:* Localized and temporary effects to vegetation habitat quality through decreased species abundance.	NM (next assessed in 2021 through project footprint GIS mapping, as above)	
Dust deposition on vegetation from haul roads and mining activities (air emissions, dust deposition, or chemical contamination on terrain, soils, and vegetation can potentially change the quality and/or chemical properties of soil and effecting vegetation)	TEMP	TEMP (Screening Level Risk Assessment)	*Prediction (Proponent Response to IRs for the Whale Tail Pit Expansion Project FEIS Addendum, "Human Health and Ecological Risk Assessment – Whale Tail Pit Expansion Project" – Golder, May 2019):* All soil concentrations <CCME/USEPA guidelines or max. baseline + 10%. All water concentrations <screening values.	NM (next assessed in 2020)	NM (2020 assessment postponed to 2021)
UNGULATES					
Sensory disturbance from vehicles, on-site equipment, human presence and vibrations, can change the amount of different quality habitats, and alter wildlife movement and behaviour	Satellite-collaring data; Road surveys; Pit and mine-site ground surveys; Incidence reports, HOL surveys	Satellite-collaring data; Road surveys; Pit and mine-site ground surveys; Remote cameras; HOL surveys	No threshold as of 2019 – Caribou Management Decision Tree in place	NA	NA
Direct loss and fragmentation of wildlife habitat from the Project footprint	Ground Surveys, Mapping, GIS Analysis	Ground Surveys, Mapping, GIS Analysis	High Suitability Habitat Predicted/Permitted Area + threshold over prediction: Growing – 30/76 ha + 10% Winter – 342/602 ha + 10%	NM (next assessed in 2021)	

Effect Pathway	Proposed Monitoring	Current Monitoring	Threshold/ Prediction	Measured Impact	
				2019	2020
Barriers to migration, which may affect population connectivity and distribution	-	Remote camera	None	NA	NA
PREDATORY MAMMALS					
NONE	-	-	-	-	-
SMALL MAMMALS					
NONE	-	-	-	-	-
RAPTORS					
NONE	-	-	-	-	-
WATERBIRDS					
Destruction of nests and flooding from construction activities including increased flows or water levels can increase risk of mortality to individual birds, which can affect population sizes	None	Trent University/ECCC migratory bird deterrent studies (2018 – 2020); Migratory Bird Protection Report (Appendix 47)	*Prediction (FEIS Section 5, Table 5.5-11)*: Total 89 nests displaced (waterbirds and upland birds)	Est. 32 – 62 nests displaced (final estimate available 2021)	
UPLAND BREEDING BIRDS					
Sensory disturbance from vehicles, on-site equipment, human presence and vibrations, can change the amount of different quality habitats, and alter wildlife movement and behaviour	None	PRISM Plots and Transects (suspended)	*Threshold: 20% change from natural* *Prediction (FEIS Volume 5, Section 5.5.3.3):* Upland bird density will decrease by 50% within 200 m of project facilities. At 1.41 birds/ha, 6000 birds may be impacted. *Prediction (FEIS Addendum, Section 5.5.3.3):* Additional 419 birds impacted. Changes in density or productivity are unlikely to be detectable.	NA – program suspended pending ongoing regulatory review.	
Destruction of nests and flooding from construction activities including increased flows or water levels can increase risk of mortality to individual birds, which can affect population sizes	None	Trent University/ECCC migratory bird deterrent studies (2018 – 2020); Migratory Bird Protection Report (Appendix 47)	See Waterbirds section, above.	See Waterbirds section, above.	

12.5.2.2 *Parts 3 & 4: Discussion*

Where impacts are exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here. In 2020, no thresholds were exceeded.

12.5.2.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

Based on the results in Table 12-27, current TEMP monitoring programs are able to address all FEIS impacts for which TEMP monitoring was recommended (i.e. monitoring is considered effective).

Effectiveness of Mitigation

FEIS-planned mitigation measures to limit impacts of the Whale Tail Pit Project on terrestrial wildlife were originally described in the Terrestrial Ecosystem Management Plan (Version 2, June 2016), a component of the FEIS (Agnico Eagle, 2016). This plan was most recently updated in 2019 (Version 7), and a mitigation audit is a component of this updated plan. The audit is to be undertaken annually, and focuses specifically on mitigation listed in Section 2 of the TEMP.

The audit evaluates:

- What mitigation has been implemented;
- Which mitigation is perceived to be, or shown to be successful;
- If new mitigation has been implemented in response to new issues; and
- If some mitigation is redundant.

In 2019, Agnico Eagle took a staged approach to the mitigation audit (e.g., review of safety barriers, berms, and designed crossings along the Whale Tail Haul Road).

However, in the context of the PEAMP evaluation, mitigation is considered effective if impact predictions (or in this case, TEMP thresholds) are not being exceeded. Therefore, since no TEMP thresholds were exceeded for the Whale Tail site in 2020, mitigation is considered effective.

Adaptive Management

Although no TEMP thresholds were exceeded in 2020, several management recommendations are planned to be implemented in 2021 along with continued implementation of all TEMP monitoring and management programs (see Meadowbank Terrestrial and Wildlife Environment PEAMP – Section 12.4.2.3).

12.5.3 Noise

12.5.3.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

In the Whale Tail Pit Project's initial FEIS (Agnico Eagle, 2016), noise impacts were modeled and assessed for three primary pathways: construction of the Whale Tail Haul Road, operation of the Whale Tail Haul Road, and operation of the Whale Tail Pit. In the FEIS Addendum for the Whale Tail Pit Expansion Project (Agnico Eagle, 2018), no new primary pathways were identified but updated noise modeling for the Project incorporated new activities (haul road widening, surface and underground mine operations) and modeling approaches (modeling for the full length of the haul road during operation). Modeling reflects mining activities during the year 2022, which is planned to be the year of highest production for the Project, and anticipated highest sound emissions.

In the FEIS Addendum's noise assessment, modeled Project sound levels at the local study area (LSA) boundary were compared with Permissible Sound Levels from AER Directive 038 (40 dBA night-time, 50 dBA daytime) to provide a reference for Project impacts. However, residual impacts were not specified or classified as significant or non-significant because noise does not have an assessment endpoint. Any potential effects associated with the primary pathways are captured in the assessment of potential effects to other VCs (e.g. wildlife and the aquatic environment).

Monitoring sites were established around the site and along the Whale Tail Haul Road, as described in the site's Noise Monitoring and Abatement Plan (Version 4, December 2018). For the purposes of this PEAMP, measured sound levels in those locations are compared to model predictions for ambient noise levels made in the FEIS Addendum (Agnico Eagle, 2018). Since all of the monitoring locations for the Whale Tail site are located well within the noise LSA (closer to project infrastructure), monitoring results are not compared to the AER Directive 038 PSLs. In accordance with noise mitigation measures listed in the FEIS Addendum (Volume 3, Appendix 3-C, Table 3-C-1 and see below Table 12-29), periodic far-field monitoring will be conducted at the LSA boundary to validate modeling and confirm adherence with the PSL. This far-field monitoring is currently scheduled for 2022, to coincide with the anticipated year of maximum production and maximum sound emissions, as indicated in the FEIS Addendum.

Table 12-28, below, compares FEIS predictions for area sound levels with the results of noise monitoring conducted under the current Noise Monitoring and Abatement Plan. For all monitoring stations, FEIS predictions were derived from the maximum sound emissions scenario: summertime, haul road widening plus surface and underground operations (Agnico Eagle, 2018 - Volume 4, Figure 4.4-3). Measured background sound levels (Agnico Eagle, 2016 - Volume 4, Appendix 4-D) were added to all predictions.

No exceedances of FEIS-modeled maximum sound levels have occurred to date.

Table 12-28 Predicted and measured sound levels for the Whale Tail Site and Haul Road. *Values identified from sound level contours in Agnico Eagle, 2018; Section 4, Figure 4.4-3 plus measured background levels (Agnico Eagle, 2016; Appendix 4-D). Measured impacts exceeding predictions are shaded grey and further discussed in Section 12.4.3.2. ^Value for 2019 from the FEIS (Agnico Eagle, 2016; Volume 4).

Effect Pathway	Monitoring Station	FEIS Addendum Predicted Max. Value (dBA)*	Measured Values $L_{eq,\ 24\text{-}h}$ (dBA)	
			2019	2020
Noise emissions from vehicles on the haul road can increase ambient noise levels.	R6	2019^: 50.0 2020+: 42.5	41.8	33.1
			-	28.2
	R7	40.4	-	36.8
Noise emissions from mining equipment can increase ambient noise levels. Blasting can result in ground vibration and increase ambient noise levels.	R8	40.4	-	32.8
	R9	45.1	-	35.5
			-	30.9
	R10	40.4	-	-
	R11	50.0	-	38.8
			-	34.7

12.5.3.2 *Parts 3 & 4: Discussion*

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion will be provided here.

No exceedances of FEIS-modeled maximum sound levels occurred in 2020. Maximum sound levels are anticipated to occur in 2022.

12.5.3.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

The noise monitoring program that was implemented in 2020 at the Whale Tail site was conducted in accordance with the approved Noise Monitoring and Abatement Plan (December, 2018), which was designed in conjunction with the FEIS Addendum's noise impact assessment. This monitoring program is therefore considered effective and suitable to confirm noise impact predictions.

Effectiveness of Mitigation

FEIS-planned mitigation measures to limit impacts of the Project on area noise levels were described in the FEIS Addendum Volume 3, Table 3-C-1 and the associated Noise Monitoring and Abatement Plan for the Project (Version 4, December 2018). This Plan includes noise mitigation measures for both the Meadowbank and Whale Tail sites, and implementation of the planned abatement measures in the current year is detailed in Section 12.4.3.

Since no exceedances of FEIS predictions have occurred for the Whale Tail site, existing mitigation measures are considered to be effective.

Adaptive Management

In 2019, noise surveys were conducted for all monitoring stations, but data was not successfully logged for stations R7 – R11. The following actions were planned for 2020 to ensure no reoccurrence of this error, and Agnico's response to each is indicated:

- Noise equipment re-training for environment technicians, as necessary, to ensure complete data collection at all monitoring stations.
    - Completed.

- Review of noise data immediately following initial monitoring events (early in the season) to ensure no logging errors occurred and sufficient valid data was collected.
    - Completed.

In addition, Agnico implemented supplemental corrective measures to ensure data was logged properly in 2020 so that FEIS predictions could be appropriately addressed. These supplemental corrective actions involved changing the settings on the sound meters and implementing a QAQC program. The QAQC program involved completing a noise data collection trial and evaluating the data to ensure the data was being recorded and the meter was working properly prior to deployment of the meter in the field.

No adaptive management actions are planned for 2021 since monitoring results indicate that sound levels onsite are not exceeding impact predictions and all planned mitigation practices are in place

12.5.4 Air Quality and Climate

12.5.4.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

In the FEIS Addendum for the Whale Tail Pit - Expansion Project, residual impacts were not classified for air quality as a VC, because air quality does not have an assessment endpoint, only measurement endpoints (i.e., comparison to relevant ambient air quality guidelines or standards). Any potential effects associated with the primary pathways are captured in the assessment of potential effects to, and residual impact classifications for, other VCs. Nevertheless, quantitative predictions were made in relation to air quality guidelines, so the validity of those predictions is assessed here, where feasible using results from approved monitoring programs.

In order to estimate potential impacts of the Project on air quality, modeling exercises were conducted as a component of the FEIS Addendum to determine emission rates and dispersion of various criteria air contaminants (CACs) from different Project sources (Agnico Eagle, 2018; Section 4). These included assessments for the Whale Tail Site and the Whale Tail Haul Road.

For the Whale Tail Haul Road, calculation of CAC emissions included the following sources:

- Exhaust from vehicles operating on the haul road; and
- Un-paved road dust from the haul road.

Air quality dispersion modelling of a representative 1 km section of the haul road oriented northeast to southwest was used to predict the following:

- Maximum plus background concentrations of CACs as a function of distance from the haul road;
- Maximum dust deposition as a function of distance from the haul road.

For the Whale Tail Site, calculation of CAC emissions included the following sources:

a) Whale Tail Pit activities, including:
   - in pit and underground drilling and blasting;
   - in pit and underground material handling;
   - un-paved road dust from mining operations; and
   - exhaust from off-road equipment operating in the Whale Tail Mining area;
b) Wind erosion from ore pad and waste storage pile;
c) Stationary combustion emissions from the camp heating and camp power; and
d) Un-paved road dust and vehicle exhaust from the section of haul road within the Property boundary; and
e) Emissions from an incinerator.

Air quality dispersion modelling was then conducted to predict maximum plus background concentrations of CACs at the Property boundary.

Associated monitoring was recommended and is conducted according to the Air Quality and Dustfall Monitoring Plan (March, 2020), as follows:

Table 12-29. Air quality monitoring locations and parameters for the Whale Tail Site and Haul Road (Air Quality and Dustfall Monitoring Plan, March 2020). ^Will be installed in 2021.

Monitoring Location	Measured Parameters
DF-6a or b	TSP, PM_{10}, $PM_{2.5}$, passive NO_2, dustfall
DF-7^	Continuous active NO_2
Whale Tail Haul Road km 134	Dustfall
Whale Tail Haul Road km 151	Dustfall
Whale Tail Haul Road km 169	Dustfall

For the Whale Tail Haul Road, dust deposition is measured over three transects using static dustfall collectors that are deployed in the field for a 30-d period. However, due to differences in particle sizes collected by static dustfall monitors (typically < 0.85 mm) and those assessed through air quality emissions and dispersion modelling (typically < 0.30 µm), these are considered screening-level comparisons only. Since dustfall canisters collect particles across a much wider range of sizes than included in standard modeling, they are very likely to measure higher rates of total dustfall than those specified in the FEIS. However, if measured dustfall is lower than predicted dustfall, model results can be verified as conservative. To improve the comparison, maximum measured background rates of static dustfall in this area during baseline studies (0.27 $mg/cm^2/30d$) are added to FEIS predicted deposition rates (see 2020 Air Quality and Dustfall Monitoring Report in Appendix 46 for further details).

For the Whale Tail Site, concentrations of suspended particulates are assessed using automated air samplers (Partisol 2025 Sequential Air Samplers). These samplers measure concentrations of suspended particulates over a 24-h period every 6 days. Onsite concentrations of NO_2 by volume (ppb) are analyzed over one month periods using a passive sampling device provided by an accredited laboratory. A continuous (active) NO_2 monitoring station is planned to be installed in 2021, and sited in consultation with ECCC. Dustfall (deposition of particulate matter) onsite is measured using the static dustfall collectors described for the Whale Tail Haul Road, above.

For reference, all results for air quality and dustfall monitoring are provided in the 2020 Air Quality and Dustfall Monitoring Report (Appendix 41), along with comparisons to regulatory guidelines, FEIS predictions, and historical measurements.

Impact predictions associated with these air contaminants and monitoring locations are identified in Table 12-30, along with measured results in 2019 and 2020. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.5.4.2.

Table 12-30 Predicted and measured impacts to air quality and climate for the Whale Tail site and haul road. 2019 measurements are compared to predictions from the FEIS for the Whale Tail Pit Project (Agnico Eagle, 2016). 2020 measurements are compared to predictions from the FEIS Addendum for the Whale Tail Pit – Expansion Project (Agnico Eagle, 2018). NA = not assessed. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.5.4.2. *Addition of background values described above. ^Predictions for the 24-h average are open-ended (> 120 µg/m^3 or >50 µg/m^3) and therefore not compared to measured values.

Effect Pathway	Proposed Monitoring (FEIS)	Monitoring Conducted	FEIS Prediction + Background	Measured Value 2019	FEIS Addendum Prediction + Background	Measured Value 2020
Vehicle emissions and fugitive dust from traffic on the haul road can affect air quality	Static dustfall	Static dustfall	Max. deposition rate* (mg/cm^2/30d) 25 m: 1.46 100 m: 0.83 300 m: 0.53 1000 m: 0.38	Max. dustfall (mg/cm^2/30d) 25 m: 8.04 100 m: 2.24 300 m: 1.42 1000 m: 0.46	Max. deposition rate* (mg/cm^2/30d) 25 m: 3.67 100 m: 2.17 300 m: 0.86 1000 m: 0.38	Max. dustfall (mg/cm^2/30d) 25 m: 3.10 100 m: 0.43 300 m: 0.39 1000 m: 0.37
Blasting, stationary and mobile combustion sources, and fugitive dust from mining activities in the Whale Tail Pit can affect air quality.	TSP, PM_{10}, $PM_{2.5}$, NO_2, dustfall	TSP, PM_{10}, $PM_{2.5}$, NO_2, dustfall	NO_2: 4.4 ppb (annual average) Static dustfall: none TSP: 174 µg/m^3 (24-h average) 16.9 µg/m^3 (annual average) PM_{10}: 52.4 µg/m^3 $PM_{2.5}$: 20.1 µg/m^3 (24-h average) 4.3 µg/m^3 (annual average)	NO_2: 1.46 ppb (annual average) TSP, PM_{10}, $PM_{2.5}$ - NA	NO_2: 8 - 16 ppb (annual average) Static dustfall: none TSP^: 30 - 45 µg/m^3 (annual average) PM_{10}: NA^ $PM_{2.5}$: 21 - 28 µg/m^3 (24-h average) 5 – 7.5 µg/m^3 (annual average)	NO_2: 1.29 ppb (annual average) TSP^: 35.0 µg/m^3 (annual average) $PM_{2.5}$: all < 28 µg/m^3 (24-h average) 1.44 µg/m^3 (annual average)
Additional 3 years of processing and use of supporting infrastructure at the Meadowbank mine site and the existing AWAR for delivery of materials can continue to affect air quality	Assessed under Meadowbank PEAMP	-	-	-	-	-
Greenhouse gas emissions from the Project can contribute to climate change.	Report emissions	GHG emissions reported	Whale Tail Site: 64.2 kt CO_2e/yr Meadowbank Mill: 180 kt CO_2e/yr	189,867 t CO_2e total (2020 recalc. = 195,564 t CO_2e total)	Whale Tail Site: 164.2 kt CO_2e/yr Meadowbank Mill: 180 kt CO_2e/yr	225,435 t CO_2e total

12.5.4.2 *Parts 3 & 4: Discussion*

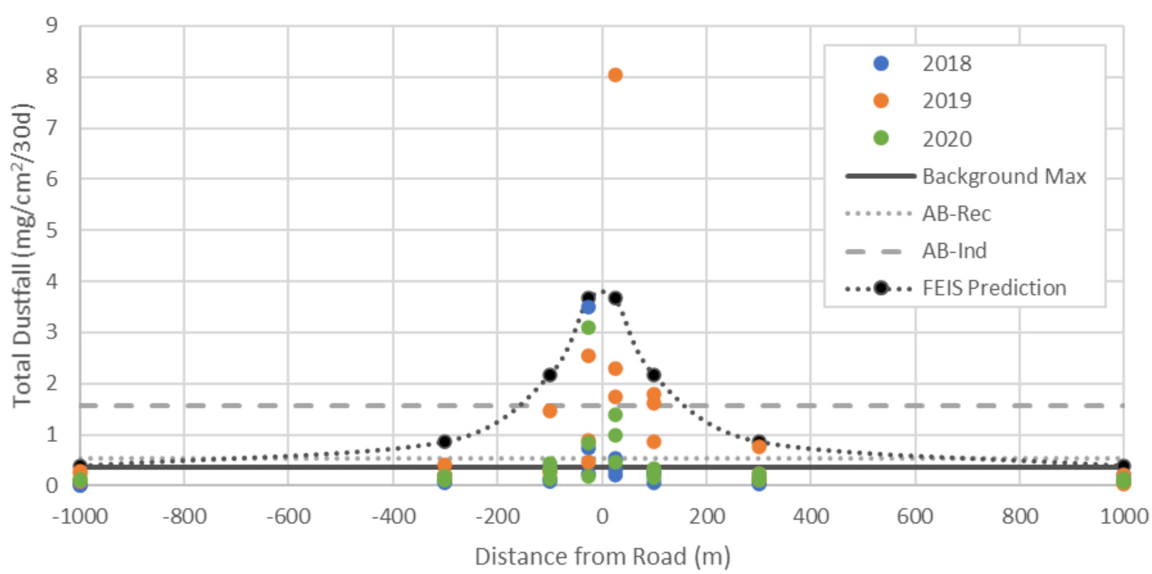
Where air quality impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here.

12.5.4.2.1.1 Whale Tail Haul Road Dustfall

Because rates of dustfall for the Whale Tail Haul Road commonly exceeded FEIS predictions historically (2019), a discussion is provided here.

In 2019, measured rates of dustfall along the Whale Tail Haul Road commonly exceeded FEIS-predicted rates of dust deposition. This was likely a result of three factors: differences in particle size between deposition modeling and dustfall measurements, sampling at ground level as opposed to 2-m height, and limited dust suppressant application in that year. As further described in the 2020 Air Quality and Dustfall Monitoring Report (Appendix 46), sampling in 2020 was conducted on stands, dust suppressant was applied to the full length of the WTHR along with intermittent watering, and FEIS predictions were updated according to the assessment for the Whale Tail Expansion Project, which commenced in 2020. All dustfall monitoring results for the WTHR in 2020 were below FEIS Addendum predictions. Historical results for August (the time period with the driest conditions and generally highest rates of traffic) are shown in Figure 67.

Figure 67. Total dustfall rates (mg/cm2/30d) for all samples collected in August along the Whale Tail Haul Road to date. 2018 and 2019 data was collected at ground level, while all August 2020 samples were collected on stands. Negative distances represent the east side of the road, and positive distances represent the west side. FEIS Prediction values are from the FEIS Addendum Appendix 4C, Table 4-C-24 (Agnico Eagle, 2018).



12.5.4.3 *Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

Although continuous active NO_2 monitoring had not yet begun in 2020, all monitoring recommended in the FEIS to assess air quality impacts is being conducted according to the Air Quality and Dustfall Monitoring Plan (March, 2020). Passive monitoring of NO_2 will continue after the active monitor is installed in 2021.

Overall, it is considered difficult to compare air quality model outputs with specific monitoring results. Air quality modelling is a statistical exercise which captures the maximum and average concentrations expected from an emissions source, provided all meteorological conditions are understood. However, air quality modelling is not appropriate for determining single-event concentrations, such as comparing a single hour of modelled data to monitoring data collected at the same time. Additionally, air quality modelling considers only the sources in the model which typically does not include transboundary transport or other background sources of contaminants.

However, air quality monitoring at the Whale Tail site is able to effectively measure ambient concentrations of CACs, and when these values are lower than model results or regulatory criteria, those predictions can be confirmed as conservative.

For most CACs at the Meadowbank and Whale Tail Sites, measured concentrations have been well below regulatory guidelines and FEIS predictions when available, so existing monitoring programs are able to effectively to validate those predictions. While static dustfall results for the Whale Tail Haul Road in 2019 tended to exceed impact predictions, dustfall methods in particular are not well aligned with deposition modelling outputs, as discussed above. Adjustments were made in 2020 which improved the effectiveness of that program for the purposes of FEIS comparisons (sampling at 1.8 m height rather than ground level).

Effectiveness of Mitigation

A summary of the planned mitigation measures for air quality during the construction and operations phases is provided in Table 12-31, along with a commentary on current implementation.

Since no FEIS Addendum impact predictions were exceeded in 2020, these mitigation measures are considered to have been effective.

As described in the Air Quality and Dustfall Monitoring Report (Appendix 46), additional monitoring thresholds were established within the Air Quality and Dustfall Monitoring Plan (March, 2020) to inform decision-making around supplemental dust mitigation. Thresholds relate to dustfall measurements at the Meadowbank and Whale Tail sites, and along the AWAR and WTHR. In 2020, a single exceedance of the onsite threshold occurred among 11 samples for the Whale Tail site. However, based on a number of factors (see Appendix 46), this sample was considered an outlier and no change in mitigation is planned based on this result.

Table 12-31. Mitigation measures described in the Project FEIS Addendum (Table 3-C-1) to reduce impacts of the project on area air quality and climate, and commentary on current implementation.

Project Activity	**Planned Mitigation Measure** (FEIS Addendum Volume 3, Table 3-C-1)	**Implementation (2020)**
General construction, operations, and decommissioning activities associated with the Whale Tail Pit and the haul road; and Mining of the Whale Tail Pit	All vehicles will adhere to the 50 km/h speed limit.	**Yes**
	Regular maintenance will be implemented for equipment and vehicles.	**Yes** – Maintenance logs
Upgrading of the haul road from the Whale Tail Pit to the Meadowbank Mine	Implement dust control measures, if needed on mine roads.	**Yes –** Air Quality and Dustfall Monitoring Plan
	Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase.	**Yes –** Air Quality and Dustfall Monitoring Plan
	Regular maintenance will be implemented for equipment and vehicles.	**Yes** – Maintenance logs
Traffic on the haul road from the Whale Tail Pit to the Meadowbank Mine	Watering of roads and enforcing speed limits to suppress dust production.	**Yes –** Air Quality and Dustfall Monitoring Plan
	Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase	**Yes –** Air Quality and Dustfall Monitoring Plan
	Regular maintenance will be implemented for equipment and vehicles	**Yes** – Maintenance logs
Construction of the Whale Tail Pit	Best Management practices for controlling fugitive dust from construction activities	**Yes** – Air Quality and Dustfall Monitoring Plan
	Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase	**Yes** – Air Quality and Dustfall Monitoring Plan
	Regular maintenance will be implemented for equipment and vehicles	**Yes** – Maintenance Logs
Mining of the Whale Tail Pit	Watering of pit roads and enforcing speed limits to suppress dust production.	**Yes** – Air Quality and Dustfall Monitoring Plan
	Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase.	**Yes** – Air Quality and Dustfall Monitoring Plan
	Regular maintenance will be implemented for equipment and vehicles.	**Yes** – Maintenance logs
	Enclosures are used to reduce fugitive emissions at the processing facility	**Yes** – Air Quality and Dustfall Monitoring Plan
	Adherence to the Incinerator Waste Management Plan	**Yes** - Incinerator Waste Management Plan

Adaptive Management

Since no exceedances of impact predictions occurred, no adaptive management actions or supplemental monitoring programs are planned for 2021 based on this PEAMP analysis.

12.5.5 Soil, Terrain, and Permafrost

12.5.5.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

Although primary pathways of effects were identified for soil, terrain, and permafrost, no residual impact predictions were made because soil, terrain, and permafrost do not themselves have measurable effects endpoints. Any potential effects associated with the primary pathways for soil, terrain, and permafrost are captured in the assessment of the potential effects to, and residual impact classifications for other VCs.

12.5.5.2 *Parts 3 & 4: Discussion*

N/A – residual impacts are not measured for permafrost directly. Potential effects are captured in the assessment of other VCs.

12.5.5.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

Soil, terrain, and permafrost conditions will be continuously monitored and inspected during all phases of the Project to ensure the effectiveness of the design criteria. Where required, adaptive management strategies will be implemented. Full details on management plans and monitoring for the waste rock pile, dewatering of the dikes, and haul road are provided in the Mine Waste Rock and Tailings Management Plan, Water Management Plan, and Whale Tail Pit and Haul Road Management Plan, respectively.

However, since no predictions were made with respect to residual impacts of permafrost directly, these programs are not designed to validate any predictions. Rather, impacts of permafrost are measured through measurement indicators for other VCs and effectiveness of those monitoring programs are assessed in the relevant sections of this report.

Effectiveness of Mitigation

A summary of the planned mitigation measures for permafrost according to the FEIS Volume 3, Table 3-C-2 is provided in Table 12-32, along with a commentary on current implementation. Similarly, planned mitigation measures for soil and terrain are provided in Table 12-31, along with current implementation. If impacts to other VCs are occurring beyond FEIS predictions and those effects are potentially due to impacts on soil, terrain, or permafrost, this record of mitigation can be reviewed. For the purposes of this annual review, the mitigation summary does not include Environmental Design Features, which are incorporated into construction plans but are not ongoing mitigation measures.

Table 12-32 Mitigation measures described in the Whale Tail FEIS (Table 3-C-2) to reduce impacts of the project on permafrost during the construction and operations phases, and commentary on current implementation. Mitigation measures listed here do not include Environmental Design Features that are factored into construction plans.

Project Activity	Planned Mitigation Measure (FEIS Table 3-C-2)	Implementation (2020)
Mine infrastructure footprint	Implement slope stability criteria to manage erosion.	Slopes were designed and built to angle of repose to minimize erosion. Slopes were built using properly graded material to minimize erosion.
	Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, sloping of banks), where needed.	Silt curtains not required as of yet. Infrastructure was designed and built with erosion and sedimentation control as needed (such as channels and dikes). Turbidity barriers installed at the outlet of newly built South Whale Tail Channel for commissioning.
Earthworks: Drilling, blasting, grading, trenching, excavation and backfilling, crushing activities, and dike construction	Minimize footprint areas for stripping and removal of material. Use appropriately designed structural fill and thickness to maintain and promote permafrost conditions.	All footprint areas were minimized as much as possible. Fill thicknesses were designed with maintaining permafrost in mind.
	Where possible, stockpiling of rock and fill from quarries and borrow sites will be placed such that surface water is not diverted through the piles.	Stockpiles were placed in areas away from surface water flow. Location planning for stockpiles considers the topography and watersheds.
	Minimum setback distance of 31 m from the ordinary high water mark of waterbodies.	The minimum setback distance of 31m from the high water mark was respected.
	Thick drifted snow greater than 1 m thick will be removed before the road fills are placed.	Snow removal took place before any fill was placed.
	Minimize depth of excavations to limit impact on active layer.	Excavation of any kind was avoided when possible and the depth was minimized as much as possible.
	Monitoring of the Whale Tail Dike will be undertaken to understand the hydraulic and thermal behaviour of the dike during filling Whale Tail (South Basin)	Regular instrument monitoring continues.
	Minimize depth of quarrying to limit impact on active layer. Maximum quarry depths of 3 m are currently planned.	Quarry depths were limited as much as possible.
	Appropriate design of quarry walls to promote stability, and to minimize annual slope degradation.	All quarry walls were designed and built to slope angles that would minimize slope degradation.
	Appropriate design of quarries to manage water and minimize ponding of water within the quarries which would result in a deeper active layer.	All quarries were designed and built with floors sloped to promote drainage.
	Where possible, stockpiling of rock and fill from quarries and borrow sites will be placed such that surface water is not diverted through the piles with runoff to surface waterbodies.	Stockpiles were placed in areas away from surface water flow. Location planning for stockpiles considers the topography and watersheds.
	Minimum setback distance of 31 m from the ordinary high water mark of waterbodies.	The minimum setback distance of 31m from the high water mark was respected.

Project Activity	Planned Mitigation Measure (FEIS Table 3-C-2)	Implementation (2020)
	Drainage from quarries will not flow directly into any waterbodies or watercourses	It was ensured that drainage from quarries would not go into any waterbodies or watercourses.
Mine Site Facilities Construction	Submission of all design drawings to the Nunavut Water Board for approval, prior to construction.	Design drawings were submitted to the Nunavut Water Board for approval prior to construction.
	Where possible, use thaw-stable road fills for construction.	Very few options are available for road fills but placement and design are always done with maintaining permafrost in mind.
	Road fill material will be placed directly over the existing soil layer without cutting, stripping, or grubbing to avoid disturbing the subgrade soils.	Road fill material was always placed directly over the existing soil layer.
	Placement of the road construction materials during winter will minimize disturbance to the permafrost.	Roads were constructed during the winter whenever possible.
	Thick drifted snow greater than 1 m thick will be removed before the road fills are placed.	Snow removal took place before any road fill was placed.
Mine Site Operations and Maintenance, including use of existing facilities and AWAR	Stockpile snow on thaw-stable materials, or in areas that are insensitive to thaw settlement.	Snow was placed in designated snow dump areas on pads made of rockfill.
	Use appropriate drainage and water diversion structures to minimize water ponding during thaw.	Water ponding was minimized through pumping during the spring thaw.
	Stock pile snow on thaw-stable materials.	Snow was placed in designated snow dump areas on pads made of rockfill.
	Use snow fencing where appropriate to minimize snow clearing requirements.	Snow fencing was not required yet.
	Annual road maintenance as required.	All roads are maintained and inspected frequently.
	Continue to use appropriate facilities management methods to reduce the amount of ice trapped within the facility.	At the Meadowbank TSF tailing deposition planning was done to reduce ice entrapment as much as possible.
	Use appropriate deposition planning (i.e., tailings placed in layers to promote freezing).	During in-pit deposition, one deposition point is used in each pit. The method of tailings discharge ensures that ice forms on the wall but not within the tailings body in the pit.
Waste Rock Storage Areas and Stockpiles	Where possible begin construction during winter months, when active layer is frozen.	Starting construction of the WRSF and stockpiles was planned for winter months whenever possible.
	Place waste rock in lifts to promote freezing of pile.	Waste rock was always placed in lifts to promote freezing.
Water Management Infrastructure	Use appropriate water management methods to avoid water ponding and to control high volume potentially erosive flows.	Water ponding and erosive flows were minimized through pumping during the spring thaw.
	Manage snow accumulation locally	Snow removal was performed according to a plan with designated snow dump areas.
	Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts or drains to alleviate the risk.	Regular inspection of the road was performed to identify the spots where water may pond or was ponding. Culverts were inspected and if they were frozen or plugged they were fixed. If culverts could not be fixed they were replaced.
	Pumped discharge to receiving lake will	Frequent testing of all water pumped to the

Project Activity	Planned Mitigation Measure (FEIS Table 3-C-2)	Implementation (2020)
	only occur while water quality discharge criteria are met.	receiving environment was performed. If water quality discharge criteria were not met the water was treated by the WTP and only pumped once the criteria was met.
	Pumped discharge will be directed to the lake environment, and not directly to outlets, to attenuate flow changes.	Pumped discharge was only directed to approved area and not directly to outlet
	Shoreline areas susceptible to extensive erosion will be addressed by appropriate erosion protection measures, mitigation measures based on adaptive management, or a combination of both, to reduce erosion and associated re-suspension of fine sediment.	Water management was planned and executed in order to avoid causing erosion on shorelines. Examples include using sunken diffusers, discharging water only on boulder pads, and discharging water to lakes at low enough rates to prevent quick rises in water elevation.
Open Pits	Use appropriate back filling methods for the placement of fill material. Initial permafrost retreat that may occur during the placement of backfill may be replaced by permafrost re-establishing within the backfilled areas.	Fill material was placed in thin lifts and compacted to promote the establishment of permafrost.
	Water inflows to the pit will require sumps and be pumped to the Attenuation Pond.	Water inflows to the pit were directed to sumps and pumped to approved location (Whale Tail Attenuation Pond, Quarry 1)
Underground Mining	Insulate water lines as they produce heat and can thaw adjacent frozen ground.	Not Applicable
	Water inflows to the underground excavations will require sumps and be pumped to the Attenuation Pond.	Not Applicable
Fuel Storage and use (includes Chemical and Hazardous material Storage and Explosives Storage Area)	Appropriate operations and maintenance procedures in place for the operation of the fuel tank farm.	To prevent fuel spills procedures were put in place to safely operate the fuel tank farm. These procedures include fuel spill protocols, inspections, and maintenance practices.
	Appropriate re-fueling areas and procedures to minimize and capture spills.	All re-fueling areas are equipped with safeguards to prevent and capture spills. Re-fueling procedures are in place and employees are trained how to re-fuel before operating vehicles.
	Implement the spill plan for potential chemical spills, including hydrocarbons	Spill plans are in place for all types of chemical spills. Employees are trained on how to apply the spill plan to their work.
Waste Management: Landfill, Landfarm, Sewage Treatment	Minimize ground disturbance.	Ground disturbance was minimized as much as possible.
	Use appropriate waste management methods to operate the facilities within the proposed waste rock piles, to promote permafrost growth.	Waste management methods are in place and followed closely to promote permafrost growth, including the creation of small sub-landfills which are encapsulated by waste rock. Inspections and surveys are performed to ensure the landfill is being constructed properly.

Table 12-33. Additional mitigation measures (beyond those in Table 12-32 above) described in the FEIS Addendum for the Whale Tail Pit Expansion Project (Table 3-C-2) to reduce impacts of the project on soil and terrain during the construction and operations phases, and commentary on current implementation. Mitigation measures listed here do not include Environmental Design Features that are factored into construction plans

Project Activity	Planned Mitigation Measure (FEIS Addendum Table 3-C-2)	Implementation (2020)
Mine Infrastructure Footprint (e.g. open pits, site roads, access roads)	Locating borrow sites as close to the haul road as practical.	**Yes**
	Minimizing borrow areas by using suitable waste rock (e.g., Vault Pit waste rock) to the greatest extent practicable	**Yes**
	Avoid new disturbances by using existing ones where possible	**Yes**
Earthworks: Drilling, blasting, grading, trenching, excavation and backfilling, crushing activities, and dike construction	Most of the overburden will be placed in the Waste Rock Storage Facility, except for a small amount used in operations, which will only be temporarily stockpiled. Overburden will be piled at the base of the Whale Tail WRSF and surrounded with waste rock to stabilize the material and then all the overburden stockpiled in the Whale Tail WRSF will be eventually covered with waste rock.	**Yes**
	Erosion control practices on steep slopes to limit wind and water erosion.	**Yes**
Mine Site Facilities Construction	Use of non-acid generating material for road construction	**Yes**
Mine Site Operations and Maintenance, including use of existing facilities and AWAR	Implement dust control measures on mine roads, when required	**Yes**
	Road surfaces will be maintained through grading and the addition of granular material.	**Yes**
	Equipment and vehicles will comply with relevant non-road emission criteria at that time of purchase	**Yes**
	Use of non-acid generating materials for road bed and fill	**Yes**
	Enforcing speed limits will assist in reducing dust emissions	**Yes**
	Implement the spill plan for potential chemical spills, including hydrocarbons	**Yes**
	Adherence to the Air Quality and Dustfall Monitoring Plan	**Yes**
	Complete a Wildlife Screening Level Risk Assessment every 3 years	

	Water Management Plan is approved and adhered to at existing facilities and Water Management Plan specific to the Whale Tail Pit areas has been developed and these plans have considered the containment and management of contact site water.	**Yes**
	Natural construction materials will be tested before they are used to confirm that they are not potential acid draining or potential sources of metal leaching	**Yes**
Waste Rock Storage Areas and Stockpiles	(see Fish and Fish Habitat section, above)	NA
Water Management Infrastructure	(see Water Quantity, Water Quality, and Fish and Fish Habitat sections above)	NA
Fuel Storage and use (includes Chemical and Hazardous material Storage and Explosives Storage Area)	(see Water Quality section above)	NA

Adaptive Management

Adaptive management consists of changes to permafrost, soil and terrain mitigation methods in response to results of monitoring programs which indicate exceedances or potential exceedances of impact predictions. In this case, the validity of impact predictions related to permafrost, soil and terrain are measured through effects on other VCs. If impacts to other VCs are exceeding predictions as a result of permafrost changes, adaptive management will be considered and reported here.

No adaptive management has been required to date.

12.5.6 Archaeology, Traditional Land Use, and Socio-Economics

Since, in many cases, is it not possible to distinguish impacts of the Meadowbank project from those of the Whale Tail project on Archaeology, Traditional Land Use, and Socio-Economics, the PEAMP evaluation is combined for this section and provided under Section 12.4.6.

12.6 CONTRIBUTIONS TO REGIONAL MONITORING

In fulfillment of Item E in Appendix D of the Project Certificate, a description of Meadowbank's investments in regional monitoring initiatives, academic research studies and ongoing data sharing programs is provided in Table 12-34. These are programs in addition to publication of compliance-related onsite monitoring results. They contribute to the general advancement of environmental management in the North, and help ensure continued optimization of environmental mitigation and monitoring programs at Meadowbank and elsewhere.

Table 12-34 Contributions of the Meadowbank Division to regional monitoring initiatives, academic research studies, and ongoing data sharing programs. Any related changes to Meadowbank's onsite monitoring and mitigation plans are described.

Program Type	Program Title	Contribution/Program Summary	Dates
Multi-Stakeholder Advisory Groups	Terrestrial Advisory Group	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 created.	2017 - present
	Meadowbank Fisheries Research Advisory Group	Created to oversee the implementation of fisheries research projects related to offsetting for Whale Tail Pit, the Meadowbank Fisheries Research Advisory Group (MFRAG) meets annually and provides a forum for input and recommendations on these studies. Members are: DFO, HTO, KIA, appointed external advisor, and AEM.	2019 - present
Regional Monitoring Studies	GN Caribou Collaring Program	Meadowbank continues to contribute to the GN DOE caribou collaring program which started in 2008. 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. 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.	2008 - present
	ZOI Study	In 2017, in collaboration with Agnico Eagle staff, Golder biologists and statisticians worked to determine a zone of influence (ZOI) 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 the near term. This project continues to be reviewed by the TAG.	2017 - present
	Caribou Behaviour and Road Crossing Study	In 2018, review of caribou data lead to a TAG project to explore the link between caribou road crossings and road closures. Results were presented to the TAG in 2019, and used to inform ongoing monitoring and mitigation. Studies to inform caribou behaviour around road crossings and blasts are ongoing.	2018 - present
Academic Research Programs	Whale Tail Complementary Measures Suite	Suite of six research programs related to fish and fish habitat in the Meadowbank region. Included in Agnico's Fish Habitat Offsetting Plan for the Whale Tail Pit project. Projected total contributions from Agnico of $1.6 M. Further information in: Fish Habitat Offsetting Plan for Whale Tail Pit, Appendix C (May, 2018).	2018 – 2034 (est).
	Baker Lake Wastewater Study	Industry partner in NSERC CRD project "Validating Environmental and Human Health Improvements Associated with Wastewater Treatment Upgrades in Arctic Communities". Total contributions from Agnico of $590,000.	2019 – 2023
	Arctic Raptors	Collaboration with Dr. Alastair Franke/Arctic Raptors to conduct annual raptor monitoring at the Meadowbank and Meliadine sites. The Arctic Raptors program has been monitoring raptor populations in the Arctic since the 1980s.	2015 - present
	Migratory Bird Ecology and Effectiveness of Deterrents	As part of commitments made during the permitting process for Whale Tail Pit, Agnico is funding and facilitating a study on effectiveness of deterrents for minimizing impacts of flooding on nesting waterbirds in the Amaruq area (Dr. Erica Nol, Trent University; Dr. Paul	2018 – 2021

Program Type	Program Title	Contribution/Program Summary	Dates
		Smith, ECCC). Total contributions from Agnico are $120,000 plus in kind support. As part of these contributions, Agnico has also agreed to support a study on ecology and nest site selection factors for area waterbirds (Dr. Erica Nol, Trent University). Finally, results of these studies will also contribute to the ArcticNet funded study "Modernizing Ecosystem Monitoring to Support Sustainable Development in the Eastern Canadian Arctic" (Dr. Paul Smith, ECCC; Dr. Christina Semeniuk, University of Windsor). This project uses advanced technology to track birds' movements across the Eastern Arctic, and behaviour in relation to human development and disturbance. Results will inform environmental impact mitigation efforts by industry, and simultaneously, contribute to national and international efforts to conserve Arctic biodiversity.	
Other Information Sharing Programs	DFO Fishout Database	Agnico contributes raw data files from all fishout programs to DFO's Fishout Database.	2009 – 2020 (last fishout program)

SECTION 13. REFERENCES

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