Appendix 1

Meadowbank and Whale Tail 2018 Annual Report Table

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 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.	11.7.2.1
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

Authorization Reference	Reporting Requirement	Report Section
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.	11.7.1.1
NIRB Project Certificate No.004 Condition 36	Inuit observation and encounter reports for on-board vessels transporting goods and fuel 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 and Vault 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

Authorization Reference	Reporting Requirement	Report Section
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 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.	8.18.1.2
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.	8.18.1.5
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

Authorization Reference	Reporting Requirement	Report Section
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 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	11.10.3
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, Commitment 18	Observe, collect and maintain information on road-use to facilitate monitoring of the nonproject uses of the road	11.10.3
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

Authorization Reference	Reporting Requirement	Report Section
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
NWB 2AM-MEA1526 Schedule B-1	Construction Details for dikes and dams.	3.1.1.1
NWB 2AM-MEA1526 Schedule B-2	Monthly and annual volume of fresh Water obtained from Third Portage Lake.	4.1.1.1
NWB 2AM-MEA1526 Schedule B-3	Monthly and annual volume of fresh Water obtained from Wally Lake.	4.1.1.2
NWB 2AM-MEA1526 Schedule B-4	Results of lake level monitoring conducted under the protocol developed as per Part D Item 5.	4.2.1
NWB 2AM-MEA1526 Schedule B-5	Summary of reporting results for the Water Balance Water Quality model and any calibrations as required in Part E Items 7-9.	4.4.2.1
NWB 2AM-MEA1526 Schedule B-6	The bathymetric survey(s) conducted prior to each year of shipping at the Baker Lake Marshalling Facility.	4.3
NWB 2AM-MEA1526 Schedule B-7	Geochemical monitoring results.	5.1.1
NWB 2AM-MEA1525 Schedule B-8	Volumes of waste rock used in construction and placed in the Rock Storage Facilities.	5.2.1
NWB 2AM-MEA1526 Schedule B-9	An update on the remaining capacity of the Tailings Storage Facility.	5.3.1
NWB 2AM-MEA1526 Schedule B-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
NWB 2AM-MEA1526 Schedule B-11	A summary report of all general waste disposal activities including monthly and annual quantities in cubic metres of waste generated and location of disposal.	6.1.1
NWB 2AM-MEA1526 Schedule B-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.	6.2.1
NWB 2AM-MEA1526 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-MEA1526 Schedule B-14	A summary of modifications and/or major maintenance work carried out on all water and waste related structures and facilities.	11.1.1
NWB 2AM-MEA1526 Schedule B-15	The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I.	8.5
NWB 2AM-MEA1526 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.	8
NWB 2AM-MEA1526 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-MEA1526 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-MEA1526 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-MEA1526 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-MEA1526 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-MEA1526 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-MEA1526 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-MEA1526 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

Authorization Reference	Reporting Requirement	Report Section
NWB 2AM-MEA1526 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-MEA1526 Part B, Item 16	The Licensee shall review the Plans or Manuals referred to in this Licence as required by changes in operation and/or technology and modify the Plans or Manuals accordingly. Revisions to the Plans or Manuals are to be submitted in the form of an Addendum to be included with the Annual Report required by Part B, Item 2, complete with a revisions list detailing where significant content changes are made..	10.2.1
NWB 2AM-MEA1526 Part E, Item 8	The Licensee shall submit a Water Quality Model for pit re-flooding as part of the Water Management Plan which shall be re-calibrated as necessary and updated at a minimum of once every two (2) years following commencement of Operations. The results and implications of the predictive model shall be reported to the Board.	4.4.2.1
NWB 2AM-MEA1526 Part E Item 9	The Licensee shall, on an annual basis during Operations, compare the predicted water quantity and quality within the pits, to the measured water quantity and quality.	4.4.3.1
NWB 2AM-MEA1526 Part E, Item 10	The Licensee shall carry out weekly inspections of all water management structures during periods of flow and the records be kept for review upon request of an Inspector. More frequent inspections may be required at the request of an Inspector. This information is to be included in the annual Water Management Plan.	4.4.1.1
NWB 2AM-MEA1526 Part I, Item 11	The Licensee shall submit to the Board as part of the Annual Report, the Geotechnical Engineer's Inspection Report. The Report shall include a cover letter from the Licensee outlining an implementation plan to address the recommendations of the Geotechnical Engineer.	3.3.1
NWB 2AM-MEA1526 Part I Item 12	The Licensee shall submit to the Board as part of the Annual Report required under Part B Item 2, all reports and performance evaluations prepared by the Independent Geotechnical Expert Review Panel.	3.1.2
NWB 2AM-MEA1526 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-MEA1526 Part I, Item 17	The Licensee shall annually review the approved QA/QC Plan and modify the Plan as necessary. Proposed changes shall be submitted to an Accredited Laboratory for approval.	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
DFO NU-03-191.3 Condition 3-6, NU-03-0191.1 Condition 3-6, Nu-03-0190 Condition 5, NU-14-1046 Condition 3-6	Submit Written Report and Photographic Record summarizing monitoring program results.	8.5
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

Authorization Reference	Reporting Requirement	Report Section
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 Condition 37	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 estimates.	9.2.1.2
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.	3.4.1.1
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 (NO_2), ozone (O_3), sulphur dioxide (SO_2), suspended particulate matter, mercury, dioxins and furans, and other chemicals remain within predicted levels and, where applicable, within levels or limits established by all applicable guidelines and regulations; c) If exceedances occur, the Proponent shall provide an explanation for the exceedance, a description of planned mitigation, and shall conduct additional monitoring to evaluate the effectiveness of mitigative measures; and d) The Proponent shall also develop, implement, and report on the quality assurance and quality control protocols used to ensure data reliability and proper functioning of equipment.	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

Authorization Reference	Reporting Requirement	Report Section
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 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	8.13.2
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 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

Authorization Reference	Reporting Requirement	Report Section
NIRB Project Certificate No.008 Condition 10	s 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	5.4.2
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
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 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

Authorization Reference	Reporting Requirement	Report Section
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 c) Ensure that the sampling locations and frequency of monitoring is consistent with and reflects the requirements of the 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.	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: 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.	8.1.2
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

Authorization Reference	Reporting Requirement	Report Section
NIRB Project Certificate No.008 Condition 23	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 b) Undertake additional site-specific studies to assess the predicted trophic change on lake ecosystem productivity to monitor c) Monitor actual loadings/concentrations in the receiving environment, identify trends in downstream chemistry and	8.10
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: a) Ensure that equipment and supplies brought to the project sites are clean and free of soils that could contain plant seeds or 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 d) Ensure any introductions of non-indigenous plant species must be promptly reported to the Government of Nunavut	8.18.7
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, 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 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.	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 collect additional data on caribou group sizes in proximity to the Project, and shall work with the Terrestrial Advisory Group to refine appropriate caribou group size thresholds that trigger additional mitigation. Initially, the group size thresholds should be set at 110 (fall), 25 (winter and summer), and 12 (spring). The Proponent shall ensure modifications to the group size thresholds are incorporated into the Terrestrial Ecosystem Management Plan and that this Plan along with a summary of consultation with the Terrestrial Advisory Group are submitted on an annual basis or as thresholds are otherwise modified in the Proponent's annual report to the to the Nunavut Impact Review Board.	8.18.2

Authorization Reference	Reporting Requirement	Report Section
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.	11.7.1.2
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: a) Locations (i.e., latitude and longitude), species, number of animals, a description of the animal activity, and a description of the b) Prior to conducting project activities, the Proponent should map the location of any sensitive wildlife sites such as denning c) Additionally, the Proponent should indicate potential impacts from the project, and ensure that operational activities are	8.18.4
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 · Results of field tests and/or the thorough literature review of the effectiveness of preferred deterrence prior to actual · Details regarding monitoring the effectiveness of mitigation measures during flooding.	8.18.5
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.	8.18.1.7
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

Authorization Reference	Reporting Requirement	Report Section
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.	11.8.1
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
	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	

Authorization Reference	Reporting Requirement	Report Section
NIRB Project Certificate No 008, Condition 46	· 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 · Include a process for adaptive management and mitigation to respond if unanticipated impacts are identified. Details of the Whale Tail Pit Socio-Economic Monitoring Program should be submitted to the Nunavut Impact Review Board	11.10.2
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	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 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 · Emphasizes plans, policies, and programs to increase transferable skills of Inuit workers, including into trades and other · Includes all plans, policies and programs related to socioeconomic factors in a temporary closure situation.	9.5

Authorization Reference	Reporting Requirement	Report Section
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 Certificate No.008 Condition 56	The Proponent shall report any archaeological site discovered during the construction, operation, and closure phases to the Government of Nunavut – Department of Culture and Heritage and the Kivalliq Inuit Association. Upon discovering an archeological site, the Proponent shall: a) Take all reasonable precautions necessary to protect the site until further direction is received from the Government of b) If it becomes necessary to disturb an archaeological site, the Proponent shall consult with the Government of Nunavut –	8.20.1
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
	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:	

Authorization Reference	Reporting Requirement	Report Section
NIRB Project Certificate No.008, Condition 59	· 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	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, 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.	8.2
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 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.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: 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.	8

Authorization Reference	Reporting Requirement	Report Section
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 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-WTP1826, 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-WTP1826 Schedule B, Item 2	Monthly and annual volume of fresh Water obtained from Nemo Lake.	4.1.2.1
NWB 2AM-WTP1826 Schedule B, Item 3	Monthly and annual volume of fresh Water obtained from Whale Tail Lake.	4.1.2.2
NWB 2AM-WTP1826 Schedule B, Item 4	Monthly and annual volume of fresh Water obtained from unnamed water bodies for Whale Tail Haul Road dust suppressant and for the Emulsion plant.	4.1.2.3
NWB 2AM-WTP18266 Schedule B, Item 5	Results of lake level monitoring conducted under the protocol developed as per Part D Item 5 for Whale Tail Lake (South Basin).	4.2.2
NWB 2AM-WTP1826 Schedule B, Item 6	Summary of reporting results for the Water Balance and Water Quality model and any calibrations as required in Part E Items 7-9.	4.4.2.2
NWB 2AM-WTP1826 Schedule B, Item 7	Geochemical monitoring results	5.1.2
NWB 2AM-WTP1826 Schedule B, Item 8	Volumes of Waste Rock used in construction and placed in the Waste Rock Storage Facility.	5.2.2.1
NWB 2AM-WTP1826 Schedule B, Item 9	Volumes of ore stockpiled and overburden stored at Whale Tail Pit site.	5.2.2.1
NWB 2AM-WTP1826 Schedule B, Item 10	Summary of quantities and analysis of Seepage and runoff monitoring from the Landfill, Waste Rock Storage Facility and associated dikes/berms	8.5.8.2
NWB 2AM-WTP1826 Schedule B, Item 11	A summary report of all general waste disposal activities including monthly and annual quantities in cubic metres of waste generated and location of disposal	6.1.2
NWB 2AM-WTP1826 Schedule B, Item 12	Reporting of Incinerator test results including the materials burned and the efficiency of the Incinerator in relation to effects on Water and the potential Deposit of Waste into Water	6.2.2
NWB 2AM-WTP1826 Schedule B, Item 13	A list and description of all unauthorized discharges including volumes, spill report line identification number and summaries of follow-up action taken.	7.1.2
NWB 2AM-WTP1826 Schedule B, Item 14	A summary of Modifications and/or major maintenance work carried out on all Water and Waste-related structures and facilities.	11.1.2
NWB 2AM-WTP1826 Schedule B, Item 15	The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I.	8.5
NWB 2AM-WTP1826 Schedule B, Item 16	The results of monitoring related to the Aquatic Effects Monitoring Program (AEMP) including: Core Receiving Environment Monitoring Program (CREMP); Metal Mining Effluent Regulation (MMER) Monitoring; Water Quality and Flow Monitoring; Visual Whale Tail Haul Road water quality monitoring; Blast Monitoring; and Groundwater Monitoring.	8
NWB 2AM-WTP1826 Schedule B, Item 17	A summary of any progressive Closure and Reclamation work undertaken, including photographic records of site conditions before and after completion of operations, and an outline of any work anticipated for the next year, including any changes to implementation and scheduling.	9.1.2
NWB 2AM-WTP1826 Schedule B, Item 18	A summary of on-going field trials to determine effective capping thickness for the Waste Rock Storage Facility for the purpose of long term environmental protection.	5.4.2
NWB 2AM-WTP1826 Schedule B, Item 19	An updated estimate of the current restoration liability based on Project development monitoring, results of restoration research and any changes or modifications to the Appurtenant Undertaking.	9.2.2.1
NWB 2AM-WTP1826 Schedule B, Item 20	A summary of any studies requested by the Board that relate to Water use, Waste disposal or Reclamation, and a brief description of any future studies planned.	10.1.2
NWB 2AM-WTP1826 Schedule B, Item 22	An executive summary in English and Inuktitut of all plans, reports, or studies conducted under this Licence.	10.4.2

Authorization Reference	Reporting Requirement	Report Section
NWB 2AM-WTP1826 Schedule B, Item 23	A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector.	11.5.2
NWB 2AM-WTP1826 Schedule B, Item 25	Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported.	4.6.2/6.3.2
NWB 2AM-WTP1826 Schedule B, Item 21	Where applicable, revisions as Addenda, with an indication of where changes have been made, for Plans, Reports, and Manuals.	10.2.2
NWB 2AM-WTP1826 Part B, Item 17	The Licensee shall review the Plans or Manuals referred to in this Licence as required by changes in operation and/or technology and modify the Plans or Manuals accordingly. Revisions to the Plans or Manuals are to be submitted in the form of an Addendum to be included with the Annual Report required by Part B, Item 2, complete with a revisions list detailing where significant content changes are made.	10.2.2
NWB 2AM-WTP1826 Part C, Item 7	The Licensee shall, within twelve (12) months following the commencement of Operations and when the Licensee files a Final Reclamation and Closure Plan as required under the Licence, submit to the Board for review an updated reclamation cost estimate, using the INAC RECLAIM Reclamation Cost Estimating Model (Version 7.0 or the most current version in use at the time the updated reclamation cost estimate is submitted to the Board).	9.2.2.1
NWB 2AM-WTP1826 Part D, Item 1	The Licensee shall submit to the Board for review, at least sixty (60) days prior to Construction, final design and Construction drawings accompanied, with a detailed report, for the following: a. Water works, including: Water Intake and causeway, Water control structures (dikes, berms, jetties, channels) and Water crossings (culverts, bridges); b. Waste disposal facilities including: Wastewater Treatment Plant, Sewage Treatment Plant, Discharge Diffuser, Waste Rock Storage Facility, Overburden stockpiles, and Landfill; and c. Whale Tail Bulk Fuel Storage Facility	3.5.2.1
NWB 2AM-WTP1826 Part D, Item 3	The Licensee shall submit to the Board for review, at least thirty (30) days prior to Construction, final design and Construction drawings accompanied, with a detailed report, for the Whale Tail Dike. The detailed report shall include items referred to in Part D Item 2.	3.5.2.1
NWB 2AM-WTP1826 Part D, Item 15	The Licensee shall submit to the Board for review, within ninety (90) days of completion of each facility designed to contain, withhold, divert or retain Waters or Wastes during the construction phase, a Construction Summary Report prepared by a qualified Engineer(s) in accordance with Schedule D, Item 1.	3.5.2.2
NWB 2AM-WTP1826 Part D, Item 16	The Licensee shall submit to the Board for review, within ninety (90) days of completion of the Whale Tail Haul Road, a Construction Summary Report prepared by a qualified Engineer(s) in accordance with Schedule D, Item 1	3.5.2.2
NWB 2AM-WTP1826 Part E, Item 9	The Licensee shall, on an annual basis during Closure, compare the predicted water quantity and quality within the pit and lake, to the measured water quantity and quality. Should the difference between the predicted base case values and measured values be 20% or greater, then the cause(s) of the difference(s) shall be identified and the implications of the difference shall be assessed and reported to the Board.	4.4.3.2
NWB 2AM-WTP1826 Part E, Item 11	The Licensee shall carry out weekly inspections of all water management structures during periods of flow and the records of inspections shall be kept for review upon request of an Inspector. More frequent inspections may be required at the request of an Inspector. This information is to be included in the annual updated Water Management Plan.	4.4.1.2
NWB 2AM-WTP1826 Part I, Item 13	The Licensee shall submit to the Board as part of the Annual Report, the Geotechnical Engineer's Inspection Report. The Report shall include a cover letter from the Licensee outlining an implementation plan to address the recommendations of the Geotechnical Engineer.	3.3.2
NWB 2AM-WTP1826 Part I, Item 14	The Licensee shall submit to the Board as part of the Annual Report required under Part B, Item 2, all reports and performance evaluations prepared by the Independent Geotechnical Expert Review Panel.	3.2.2
NWB 2AM-WTP1826 Part I, Item 16	The Licensee shall submit the results and interpretation of the Seepage monitoring required in Part I Item 15 in the Annual Report required under Part B, Item 2	3.1.2.1
NWB 2AM-WTP1826 Part E, Item 7	The Licensee shall submit an updated Water Management Plan on an annual basis to the Board for review following the commencement of Operations. The Plan must include an updated Water Balance. The Water Management Plan shall include an action plan to be implemented if predicted re-flooded pit water quality indicates that treatment is necessary	4.4.2.2

Authorization Reference	Reporting Requirement	Report Section
NWB 2AM-WTP1826 Part E, Item 8	The Licensee shall submit a Water Quality Model for pit re-flooding and for WRSF contact water mixing into Mammoth Lake post-Closure as part of the Water Management Plan which shall be re-calibrated as necessary and updated annually following commencement of Operations. The results and implications of the predictive model shall be reported to the Board.	4.4.2.2
NWB 2AM-WTP1826 Part E, Item 11	The Licensee shall carry out weekly inspections of all water management structures during periods of flow and the records of inspections shall be kept for review upon request of an Inspector. More frequent inspections may be required at the request of an Inspector. This information is to be included in the annual updated Water Management Plan.	4.4.1.2
NWB 2AM-WTP1826 Part I, Item 3	The Licensee shall submit for Board approval, at least ninety (90) days prior to Operations an updated CREMP. The Program shall include all comments provided during the technical review of Application and shall include a comparison of monitoring results for receiving waters to model predictions (including base case predictions) and to thresholds identified for management actions, should trends indicate water quality objectives may be exceeded	8.1.2
NWB 2AM-WTP1826 Part I, Item 5	The Licensee shall submit to the Board for approval and implementation, within sixty (60) days of the approval of the Licence by the Minister, a Mercury Monitoring Studies Program. The Program shall include all comments and recommendations provided during the technical review of Application.	8.2
NWB 2AM-WTP1826 Part I, Item 13	The Licensee shall submit to the Board as part of the Annual Report, the Geotechnical Engineer's Inspection Report. The Report shall include a cover letter from the Licensee outlining an implementation plan to address the recommendations of the Geotechnical Engineer.	3.3.2
NWB 2AM-WTP1826 Part I, Item 14	The Licensee shall submit to the Board as part of the Annual Report required under Part B, Item 2, all reports and performance evaluations prepared by the Independent Geotechnical Expert Review Panel.	3.2.2
NWB 2AM-WTP1826 Part I, Item 20	The Licensee shall annually review the approved QA/QC Plan and modify the Plan as necessary. Proposed changes shall be submitted to an Accredited Laboratory for approval.	8.5.7
NWB 2AM-WTP1826 Part J, Item 2	The Licensee shall submit to the Board for approval within twelve (12) months of Operations, an updated Interim Whale Tail Pit Closure and Reclamation Plan prepared in accordance with the "Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories", issued by the Mackenzie Valley Land and Water Board (MVLWB) and Aboriginal Affairs and Northern Development Canada (AANDC) in 2013 (MVLWB/AANDC 2013) and consistent with the INAC Mine Site Reclamation Policy for Nunavut, 2002. The Plan shall include all mine related facilities and Whale Tail Pit Haul Road.	9.1.2
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	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	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 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

Authorization Reference	Reporting Requirement	Report Section
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.	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 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	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	8.8.2.2
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	8.8.2.3
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 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	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	8.8.2.4.6
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
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	3.4.2.1

Authorization Reference	Reporting Requirement	Report Section
	ii. Such other data as are reasonably required by the Minister from time to time.	
CIRNAC Land Lease 66H/8-1-4, Condition 27	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.	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/8-1-4, 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/8-2-1, 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 ROW KVRW15F01 Item 54	AEM shall provide to KIA a detailed 'As Built Drawings' of all aspects of the Road within six (6) months after the date of final completion of the Construction, as determined in the certificates of final completion of such Construction work issued by the supervising engineer or other professional in charge of the Construction work.	3.5.2.2
KIA Commercial Lease KVCA314C01 Condition 6.01 (9)(1):	Information respecting the Tenant's compliance with the terms of this lease and any permits or licences required in respect of its Operations on the Property, together with details of any incidents of non-compliance, the results of any inspection reports prepared by or fines levied by any competent regulatory authority and any remedial action relating thereto	11.5.1
KIA Commercial Lease KVCA314C01 Condition 6.01 (9)(2):	Copies of any communications, advice, documents, reports or other information on environmental matters submitted by the Tenant to any competent regulatory authority;	10.4.2
KIA Commercial Lease KVCA314C01 Condition 6.01 (9)(3):	Copies of any environmental monitoring reports or environmental studies in respect of the Property, together with any interpretation or analysis of the date contained therein done by the Tenant or its agents or consultants	10.4.2
KIA Commercial Lease KVCL314C01, Condition 6.01 (9) (4)	A report of any reclamation work undertaken or required to be undertaken in accordance with this lease.	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 KVCA17Q01, Condition 20	The permittee shall conduct reclamation activities during the first twelve months of the term of this Permit in accordance with the Reclamation Plan attached as Schedule 3. The permittee shall annually thereafter submit to the Association an Reclamation Plan detailing the proposed reclamation activities for the upcoming year.	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
EXPLORATION WHALE TAIL PROJECT		
NWB 2BB-MEA1828 Part B, Item 6a	The daily, monthly and annual quantities in cubic metres of all freshwater obtained for all purposes	4.1.3.1
NWB 2BB-MEA1828 Part B, Item 6b	The daily, monthly and annual quantities in cubic metres of water pumped from the underground.	4.1.3.2
NWB 2BB-MEA1828 Part B, Item 6c	An estimate of the current volume of waste rock and ore stockpiled on site	5.2.3

Authorization Reference	Reporting Requirement	Report Section
NWB 2BB-MEA1828 Part B, Item 6d	Tabular summary of all data generated under the Monitoring Program, Part J	8.5.3.3
NWB 2BB-MEA1828 Part B, Item 6e	A summary of modification and/or major maintenance work carried out on the Water Supply Facilities, Bulk Fuel Storage and Containment Facilities, and Wastewater Treatment Facility, including all associated structures, and an outline of any work anticipated for the next year	3.5.3
NWB 2BB-MEA1828 Part B, Item 6f	A list of unauthorized discharges and a summary of follow-up actions taken	11.6.3
NWB 2BB-MEA1828 Part B, Item 6g	Any revisions to the Spill Contingency Plan, Water Management Plan, Waste Management Plan, Quarry Management Plan, Abandonment and Restoration Plan, as required by Part B, Item 12, submitted in the form of an Addendum	10.3
NWB 2BB-MEA1828 Part B, Item 6h	An updated estimate of the current Meadowbank Advanced Exploration Project restoration and liability, as required under Part B, Item 2, based upon the results of the restoration research, project development monitoring, and any modifications to the site plan	9.2.3
NWB 2BB-MEA1828 Part B, Item 6i	A summary of drilling/trenching activities and progressive reclamation of drill/trench sites.	9.1.3
NWB 2BB-MEA1828 Part B, Item 6j	Report all artesian flow occurrences as required under Part F, Item 7.	4.1.3.3
NWB 2BB-MEA1828 Part B, Item 6k	A description of all progressive and or final reclamation work undertaken, including photographic records of site conditions before, during and after completion of operations.	9.1.3
NWB 2BB-MEA1828 Part B, Item 6l	A summary of any specific studies or reports requested by the Board, and a brief description of any future studies planned or proposed.	10.1.3
NWB 2BB-MEA1828 Part B, Item 6m	A summary of public consultation/participation, describing consultation with local organizations and residents of the nearby communities, if any were conducted	11.9.8
NWB 2BB-MEA1828 Part B, Item 6n	Any other details on water use or waste disposal requested by the Board by the 1st of November of the year being reported.	4.6.3/6.3.3
NWB 2BB-MEA1828 Part G, Item 3	The Licensee shall provide as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modification. These plans and drawings shall be stamped by an Engineer.	11.1.3
NWB 2BB-MEA1828 Part J, Item 6	The Licensee shall provide the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where sources of water are utilized for all purposes.	4.1.3.4
NWB 2BB-MEA1828 Part J, Item 7	The Licensee shall provide the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where wastes associated with camp operations and exploration activities are deposited including sump locations associated with drilling and drill casings left as stuck and cut off and for further drilling in casings	6.1.3
NWB 2BB-MEA1828 Part J, Item 8	The Licensee shall determine the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all drill holes located within thirty-one (31) metres of the ordinary High Water Mark, as per Part F, Item 2, and provide these locations on a map of suitable scale for review as part of the annual report.	11.3.2
NWB 2BB-MEA1828 Part J, Item 9	The Licensee shall establish background and post drilling water quality for pH, conductivity, temperature and dissolved oxygen at the nearest downstream water body to drill locations. Monitoring is to be done just prior to commencement of drilling and weekly thereafter, concluding one week after drilling has been completed and the site restored	8.5.3.3
NWB 2BB-MEA1828 Part J, Item 10	The Licensee shall obtain representative samples of the water column below any ice where required under Part F, Items 9 and 10. Monitoring shall include, at a minimum, the following Physical Parameters (pH, electrical conductivity, total suspended: solids), Major Ions (Calcium, chloride, magnesium, potassium, sodium, sulphate), Total Metals (Aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, titanium, uranium, vanadium and zinc).	8.5.3.3
NWB 2BB-MEA1828 Part J, Item 11	he Licensee shall establish baseline water quality conditions prior to drilling within thirty-one (31) metres of the ordinary High Water Mark as per Part F, Items 2 and 3. Monitoring shall include the following: Physical Parameters (pH, electrical conductivity, total suspended solids, turbidity). Major Ions (Calcium, chloride, magnesium, potassium, sodium, sulphate) Total Metals (Aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, titanium, uranium, vanadium and zinc)	8.5.3.3
NWB 2BB-MEA1828 Part J, Item 12	The Licensee shall, where turbidity is observed in adjacent waters or waters immediately downstream of any drilling program conducted within thirty-one (31) metres of the ordinary High Water Mark of any water body, during summer following any such drilling program as per Part F, Item 5 (c), conduct additional monitoring of the parameters listed in Part J, Item 10 to determine whether any further mitigation is required.)	8.5.3.3
NWB 2BB-MEA1828 Part J, Item 13	The Licensee shall monitor runoff and/or discharge from the quarry sites to receiving environment, during blasting activities, during periods of flow and following significant precipitation events, on a monthly basis	8.5.6.3
NWB 2BB-MEA1828 Part J, Item 14	The Licensee shall, during periods of flow and just after a major rainfall event, conduct water quality testing immediately upstream and downstream of the water crossings, any significant water seeps in contact with the road and any flows originating from borrow pits or rock quarries on a monthly basis prior to construction, during the construction and upon completion for the parameters listed under Part J, Item 11	8.5.6.3

Authorization Reference	Reporting Requirement	Report Section
NWB 2BB-MEA1828 Part J, Item 15	The Licensee shall implement a water crossings visual inspection and maintenance program prior to, during spring freshet and after heavy rainfall events to identify issues related to watercourse crossings structural integrity and hydraulic function	8.5.6.3
NWB 2BB-MEA1828 Part J, Item 16	The Licensee shall annually review the approved by accredited laboratory Quality Assurance/Quality Control plan and modify it as necessary. Proposed changes shall be submitted to an accredited laboratory for approval	10.3
NWB 2BB-MEA1828 Part J, Item 19	The Licensee shall include in the Annual Report required under Part B, Item 2 and in Construction Summary Report required under Part E, Item 8 all data, monitoring results and information required by this Part	3.5.3

Table 1.2: Meadowbank and Whale Tail Status of Sampling Stations

MEADOWBANK GOLD PROJECT			
NWB Station	**Description**	**Phase**	**2018 Reporting Status**
ST-DC-1 to TBD	Monitoring stations during Dike Construction as defined in Part D Item 5	Construction	Not applicable in 2018
ST-DD-1 to TBD	Monitoring stations during Dike Dewatering as defined in Part D Item 5	Construction	Not applicable in 2018
ST-1	Water Intake for camp, mill and re-flooding	Water Intake for camp, mill and re-flooding	Section 4.1
ST-1W	Water Intake for re-flooding	Water Intake for camp, mill and re-flooding	Not applicable in 2018
ST-3	Water Intake for Emulsion Plant	Late operation, closure	Section 4.1.2.3
ST-4	Water reclaimed from Tailings Storage Facility	Late operation, closure	Not applicable in 2018
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 8.3.3.1.3
ST-9	Portage Attenuation Pond prior to discharge through Third Portage Lake Outfall Diffuser	Early operation	Not applicable in 2018
ST-10	Vault Attenuation Pond prior to discharge through Wally Lake Outfall Diffuser	Late operation	Not applicable in 2018
ST-11	Tailings Storage Facility	Post closure	Not applicable in 2018
ST-12	Portage/ Goose Pit Lake	Post closure	Not applicable in 2018
ST-13	Vault Pit Lake	Post closure	Not applicable in 2018
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	Not applicable in 2018
ST-19**	South Portage Pit Sump	Early operations	Section 8.5.3.1.9
	Portage Pit Lake	Late operations	Not applicable in 2018
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 2018

NWB Station	Description	Phase	2018 Reporting Status
ST-23	Vault Pit Sump	Late operations	Section 8.5.3.1.12
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	Not Applicable in 2018
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 8.12.1
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 (MEA-4)	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 (MEA-4)	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-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**	**2018 Reporting Status**
ST-WT-DC-1 to TBD	Monitoring stations during Dike Construction as defined in Part D Item 5	Construction	Section 8.5.1.2 and Appendix 63
ST-WT-DD-1 to TBD	Monitoring stations during Dike Dewatering as defined in Part D Item 5	Construction	Not applicable in 2018
ST-WT-S-1 to TBD	Seeps (to be determined)	Operations	Not applicable in 2018
		Closure	Not applicable in 2018
ST-WT-GW-1 to TBD	Groundwater wells (to be determined) as required under Groundwater Monitoring Plan	Operations	Section 8.12.4.1.3
		Closure	Not applicable in 2018
ST-WT-1	Attenuation Pond, pre-treatment	Operations	Not applicable in 2018
ST-WT-2	Attenuation Pond, post-treatment;last point of control before discharge	Operations	Not applicable in 2018

NWB Station	Description	Phase	2018 Reporting Status
ST-WT-3	Waste Rock Storage Facility (WRSF) Pond prior to pumping to Attenuation Pond	Operations Closure	Sections 8.5.3.2.1
	Waste Rock Storage Facility (WRSF) Pond prior to discharge to Mammoth Lake	Post-Closure	Not applicable in 2018
ST-WT-4	Whale Tail Pit or pit sump	Operations	Not applicable in 2018
ST-WT-5	Water Intake from Nemo Lake	Construction Operations	Sections 4.1.2.1
ST-WT-6	Lake A47	Construction Operations Closure	Sections 8.5.3.2.2
ST-WT-7	East diversion channel	Operations	Not applicable in 2018
ST-WT-8	Water Intake from Whale Tail Lake	Closure	Sections 4.1.2.2
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 2018
ST-WT-10	Pit Lake (as the Pit fills)	Closure Post-Closure	Not applicable in 2018
ST-WT-11	Sewage Treatment Plant	Operations Closure	Not applicable in 2018
ST-WT-12	Secondary containment at Whale Tail Bulk Fuel Storage Facility	Operations Closure	Not applicable in 2018
ST-WT-13	Lake A45	Operations Closure	Not applicable in 2018
ST-WT-14	Lake A16 outlet	Construction Operations Closure	Section 8.5.3.2.3
ST-WT-15	Lake A15	Construction Operations Closure	Section 8.5.3.2.4

NWB Station	Description	Phase	2018 Reporting Status
EXPLORATION WHALE TAIL PROJECT			
ST-WT-MEA-1	Amaruq (IVR) Camp Water Intake and sources for industrial/drilling	Construction Operations Closure	Section 4.1.3
ST-WT-MEA-2	Effluent discharged from the Wastewater Treatment System “Bionest” (WWTS)	Construction Operations Closure	Section 8.5.4.3
MEA-3	Effluent discharged from the Bulk Fuel Storage Facilities	Construction Operations Closure	Not applicable in 2018
ST-WT-MEA-4	Effluent discharged from Stormwater Management Pond A-P5 and Trench-water containment ponds	Construction Operations Closure	8.5.3.2.5

Authorization Reference	Reporting Requirement	Report Section
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
EXPLORATION WHALE TAIL PROJECT		
NWB 2BB-MEA1828 Part B, Item 6a	The daily, monthly and annual quantities in cubic metres of all freshwater obtained for all purpose	4.1.3.1
NWB 2BB-MEA1828 Part B, Item 6b	The daily, monthly and annual quantities in cubic metres of water pumped from the underground	4.1.3.2
NWB 2BB-MEA1828 Part B, Item 6c	An estimate of the current volume of waste rock and ore stockpiled on site	5.2.3
NWB 2BB-MEA1828 Part B, Item 6d	Tabular summary of all data generated under the Monitoring Program, Part	8.5.3.3
NWB 2BB-MEA1828 Part B, Item 6e	A summary of modification and/or major maintenance work carried out on the Water Supply Facilities, Bulk Fuel Storage and Containment Facilities, and Wastewater Treatment Facility, including all associated structures, and an outline of any work anticipated for the next year	3.5.3
NWB 2BB-MEA1828 Part B, Item 6f	A list of unauthorized discharges and a summary of follow-up actions taker	11.6.3
NWB 2BB-MEA1828 Part B, Item 6g	Any revisions to the Spill Contingency Plan, Water Management Plan, Waste Management Plan, Quarry Management Plan, Abandonment and Restoration Plan, as required by Part B, Item 12, submitted in the form of an Addendur	10.3
NWB 2BB-MEA1828 Part B, Item 6h	An updated estimate of the current Meadowbank Advanced Exploration Project restoration and liability, as required under Part B, Item 2, based upon the results of the restoration research, project development monitoring, and any modifications to the site plan	9.2.3
NWB 2BB-MEA1828 Part B, Item 6i	A summary of drilling/trenching activities and progressive reclamation of drill/trench site:	9.1.3
NWB 2BB-MEA1828 Part B, Item 6j	Report all artesian flow occurrences as required under Part F, Item 7	4.1.3.3
NWB 2BB-MEA1828 Part B, Item 6k	A description of all progressive and or final reclamation work undertaken, including photographic records of site conditions before, during and after completion of operations	9.1.3
NWB 2BB-MEA1828 Part B, Item 6l	A summary of any specific studies or reports requested by the Board, and a brief description of any future studies planned or proposed.	10.1.3
NWB 2BB-MEA1828 Part B, Item 6m	A summary of public consultation/participation, describing consultation with local organizations and residents of the nearby communities, if any were conducted	11.9.8
NWB 2BB-MEA1828 Part B, Item 6n	Any other details on water use or waste disposal requested by the Board by the 1st of November of the year being reporte	4.6.3/6.3.3
NWB 2BB-MEA1828 Part G, Item 3	The Licensee shall provide as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modification. These plans and drawings shall be stamped by an Enginee	11.1.3
NWB 2BB-MEA1828 Part J, Item 6	The Licensee shall provide the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where sources of water are utilized for all purposes	4.1.3.4
NWB 2BB-MEA1828 Part J, Item 7	The Licensee shall provide the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where wastes associated with camp operations and exploration activities are deposited including sump locations associated with drilling and drill casings left as stuck and cut off and for further drilling in casing	6.1.3
NWB 2BB-MEA1828 Part J, Item 8	The Licensee shall determine the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all drill holes located within thirty-one (31) metres of the ordinary High Water Mark, as per Part F, Item 2, and provide these locations on a map of suitable scale for review as part of the annual report	11.3.2
NWB 2BB-MEA1828 Part J, Item 9	The Licensee shall establish background and post drilling water quality for pH, conductivity, temperature and dissolved oxygen at the nearest downstream water body to drill locations. Monitoring is to be done just prior to commencement of drilling and weekly thereafter, concluding one week after drilling has been completed and the site restore	8.5.3.3
NWB 2BB-MEA1828 Part J, Item 10	The Licensee shall obtain representative samples of the water column below any ice where required under Part F, Items 9 and 10. Monitoring shall include, at a minimum, the following Physical Parameters (pH, electrical conductivity, total suspended: solids), Major Ions (Calcium, chloride, magnesium, potassium, sodium, sulphate), Total Metals (Aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, titanium, uranium, vanadium and zinc)	8.5.3.3
NWB 2BB-MEA1828 Part J, Item 11	he Licensee shall establish baseline water quality conditions prior to drilling within thirty-one (31) metres of the ordinary High Water Mark as per Part F, Items 2 and 3. Monitoring shall include the following: Physical Parameters (pH, electrical conductivity, total suspended solids, turbidity). Major Ions (Calcium, chloride, magnesium, potassium, sodium, sulphate) Total Metals (Aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, titanium, uranium, vanadium and zinc	8.5.3.3
NWB 2BB-MEA1828 Part J, Item 12	The Licensee shall, where turbidity is observed in adjacent waters or waters immediately downstream of any drilling program conducted within thirty-one (31) metres of the ordinary High Water Mark of any water body, during summer following any such drilling program as per Part F, Item 5 (c), conduct additional monitoring of the parameters listed in Part J, Item 10 to determine whether any further mitigation is required.	8.5.3.3
NWB 2BB-MEA1828 Part J, Item 13	The Licensee shall monitor runoff and/or discharge from the quarry sites to receiving environment, during blasting activities, during periods of flow and following significant precipitation events, on a monthly bas	8.5.6.3
NWB 2BB-MEA1828 Part J, Item 14	The Licensee shall, during periods of flow and just after a major rainfall event, conduct water quality testing immediately upstream and downstream of the water crossings, any significant water seeps in contact with the road and any flows originating from borrow pits or rock quarries on a monthly basis prior to construction, during the construction and upon completion for the parameters listed under Part J, Item 11	8.5.6.3
NWB 2BB-MEA1828 Part J, Item 15	The Licensee shall implement a water crossings visual inspection and maintenance program prior to, during spring freshet and after heavy rainfall events to identify issues related to watercourse crossings structural integrity and hydraulic functic	8.5.6.3
NWB 2BB-MEA1828 Part J, Item 16	The Licensee shall annually review the approved by accredited laboratory Quality Assurance/Quality Control plan and modify it as necessary. Proposed changes shall be submitted to an accredited laboratory for approva	10.3
NWB 2BB-MEA1828 Part J, Item 19	The Licensee shall include in the Annual Report required under Part B, Item 2 and in Construction Summary Report required under Part E, Item 8 all data, monitoring results and information required by this Par	3.5.3

Table 1.3 - Agnico's commitment following Regulators review of documents

Authority	Site	Document Reference to comments	Regulator's Comment	Regulator's Recommendation	Agnico's Response to initiale comments	2018 Annual Report Section were comments are addressed
NIRB	MBK	NIRB 2017-18 Annual Monitoring Report for the Meadowbank Gold Project with Board's Recommendations - Spill Management – Condition 26	In review of Agnico Eagle's 2017 annual report, and similar to the concern expressed by the Kivalliq Inuit Association and the Crown-Indigenous Relations and Northern Affairs Canada, it is noted that even though there was a slight decrease in the number of reportable spills from 2016 to 2017, the number of spills still remain high for the 2017 monitoring period. In addition, it is noted that the number of non-reportable spills have increased since 2014. No discussion was provided by Agnico Eagle on the possible reasons for why the number of non-reportable spills continue to rise even though additional training has been implemented based on the Spill Reduction Action Plan.	The Board requests that Agnico Eagle provide a written submission explaining the conditions which contributed to the increase in spills on site for 2017 (both reportable and non-reportable spills) and provide a discussion on what is being done at site to reverse this trend. The Board recommends that Agnico Eagle increase its spill reporting frequency to occur each quarter, to improve the ability to determine the effectiveness of its spill reduction efforts. The requested information should be provided to the Board within **30 days** following the issuance of this recommendation.	As stated in the 2017 Annual report, 442 spills (reportable and non-reportable) occurred on the Meadowbank Mine Site and the Amaruq Exploration Access Road (AEAR). Agnico acknowledges that the overall number of spills have increased but also would like to mention that the totals reported in the 2AM-MEA1526 Meadowbank 2017 Annual report included spills along the AEAR, that were also reported under the 8BC- AEA1525 AEAR 2017 Annual report. Thus, double accounting was included within the tabulations of Meadowbank reporting. To be consistent with previous years, only spills on the Meadowbank Mine site, AWAR and Bake Laker infrastructures should be used for comparison. Refer to Table below for a spills summary from 2011-2017. Data from 2017 shows a decrease of 18% in reportable spills and a slight increase of 2% in overall non-reportable spills for the Meadowbank site. Moving forward, Agnico will ensure data is presented in future annual reports in a manner to prevent confusion and help the review process. Agnico Eagle is already reporting spills on a monthly basis via the NWB Monthly report required under Water License 2AM-MEA1526 and quarterly via the KIA Production Lease Report. If required by NIRB, the report can be provided to the Inspector as well. Agnico notes that emphasis on spill reporting and proper data collection was put forward in 2016, and as showed effective in identifying areas of focus and improvements. By continuing education and awareness within our sites, we are confident that the overall environmental impacts are limited. As stated in the 2016 Annual report, the general awareness on spill management and reporting with management and operations were expanded by meeting equipment users and stakeholders. Increased focus on reporting, identifying and notifications assisted in finding opportunities of reduction and also contributed to the increase noted above. This process enabled proactive maintenance to be done on equipment identified and reduce the overall quantities of material spilled. Mandatory spill training is included in the Meadowbank site induction and the Environmental Department is working in a collaborative approach to ensure field personnel are reminded consistently on best practices in spill management. Refresher training is also being developed. Furthermore, Agnico continues to reference the Spill Reduction Action Plan started in 2016. Key Performance Indicators (KPI) were developed to monitor reported spills. Spill Frequency is calculated and reported to the daily management meeting. 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. All internal reported spills and to regulators are managed according to our 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.	Section 7.1 of the 2018 Annual Report
NIRB	MBK			The Board requests that, within future annual reporting, Agnico Eagle present the number of reportable and non-reportable spills (from 2011 onward) in a table or graph for ease of review. Agnico Eagle is to include the requested information commencing in its **2018 Annual Report** submission to the NIRB.	Agnico Eagle acknowledge the NIRB recommendation and will include the information in the 2018 Annual Report, as mentioned in NIRB Recommendation 1 above.	Section 7.1 of the 2018 Annual Report
NIRB	MBK	2017-18 Annual Monitoring Report for the Meadowbank Gold Project with Board's Recommendations - Appendix D, the Annual Report and the PEAMP	The NIRB notes that Agnico Eagle's 2017 Annual Report provided a detailed analysis of results from its 2017 monitoring program and that it compared observed impacts noted in 2017 to predictions made within the Final Environmental Impact Statement (FEIS). Agnico Eagle's evaluation focused on the valued ecosystemic components (VECs) that had been identified in the FEIS, including the aquatic environment, the terrestrial and wildlife environment, noise quality, air quality, permafrost and socio-economics. The NIRB acknowledges that Agnico Eagle has worked to improve upon its reporting of findings within its post-environmental assessment monitoring program (PEAMP) and notes the general clarity of the presentation of information in its tables of potential impacts, potential cause(s), proposed monitoring, monitoring conducted for the year, predicted values and measured values/observed impacts. However, the NIRB found that the discussion and analysis within the PEAMP could be expanded upon especially to include trends that may be observed. The NIRB recognizes Agnico Eagle previously conveyed interpretation of Appendix D as not explicitly dictating that the PEAMP involve producing a trend analysis of previous years' monitoring data; however, the Board would like to note that the objective of the PEAMP as detailed in Appendix D is to provide this trend analysis as part of the summary report. In reviewing the Annual Report and as noted by regulatory parties, there was an increase in a number of water quality parameters that are exceeding predictions from the year to year since 2012. The overall lack of reference to baseline data or to data from previous years makes it difficult to quantify or measure the relevant effects of the Project. While comparison between monitoring as proposed in the FEIS and monitoring undertaken in 2017 was helpful, rationale for why these were different was not always clearly presented.	The Board requires that Agnico Eagle provide a comprehensive update on the post-environmental assessment monitoring program for the Project. This must 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. The update must identify where original 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 employed. The update must also provide a summary of lessons learned from the Project which can be used to improve future performance at this and other mining developments in Nunavut. The comprehensive update should be provided to the Board within **30 days** following the issuance of this recommendation, and also be included in the **annual reports thereafter.**	It is Agnico's belief that a comprehensive update is not warranted as part as the PEAMP. According to the proponent's responsibilities identified under Appendix D of the Project Certificate, examinations are provided as required in individual monitoring reports. As such, trending analyses would also not be required under the aforementioned responsibilities. Agnico is confident that these discussions reference any potential impacts observed. In addition, the annual report is based on an extensive review of the FEIS throughout its content. Nonetheless, Agnico, is committed on improving identification of noted effects within the PEAMP summary report in this section and intends to highlight any trends observed for VEC's exceeding predictions with the 2018 Annual report and moving forward.	Section 12 of the 2018 Annual Report.

NIRB	MBK	2017-18 Annual Monitoring Report for the Meadowbank Gold Project with Board's Recommendations - Aquatic Environment	As in previous years, the post-environmental assessment monitoring program (PEAMP) section of the 2017 Annual Report did not provide any discussions on the Core Receiving Environment Monitoring Program (CREMP) or Agnico Eagle programs or any discussion on the changes observed/detected at the aquatic stations. Further, there was no discussion on the changes observed over time at these stations since operations commenced, or what the cause may be for the changes observed at these stations. As noted previously, a year-to-year comparison would provide a robust analysis and would have been useful to help identify trends in the data collected for the aquatic environment, specifically for the water quality and sediment quality data. In review of Agnico Eagle's Annual Report, and as noted by regulatory parties, there was an increase in a number of parameters that are exceeding predictions from the year to year since 2012 or trigger exceedances in several parameters for both water quality and sediment chemistry. In response, Agnico Eagle stated that the CREMP continues to detect changes in some general water quality parameters that appear to be related to mining activity or that trends observed in sediment samples are due to natural spatial heterogeneity. Agnico Eagle also noted that these changes were reflected in higher concentrations of some parameters when compared to the model predictions in Final Environmental Impact Statement (FEIS). Agnico Eagle set thresholds and/or triggers at the 95th percentile of baseline data and concluded while that these results represent mine related changes, the observed concentrations are still relatively low and unlikely to adversely affect aquatic life. Further, Agnico Eagle indicated that due to the low likelihood of adverse effects on aquatic life, a discussion was not required on the management actions with respect to trigger exceedances observed in water. Further, similar to the Kivalliq Inuit Association's concern, it was noted that the updated water quality model indicated that treatment may be required for aluminum, arsenic, cadmium, chromium, copper, fluoride, iron, nickel, and selenium so that the pit water quality will meet the P.O. Box 1360 Cambridge Bay, NU X0B 0C0 Phone: (867) 983-4600 Fax: (867) 983-2594 Page 8 of 12 Canadian Council of Ministers of the Environment (CCME) criteria at mine closure, while silver is no longer anticipated to be a problem at closure due to low loadings in the 2016 mill effluent. This represents a change from the previous annual report.	The Board requires Agnico Eagle to provide a trend analysis and discussion on the observed project effects on the aquatic environment based on the data collected to date under the Core Receiving Environment Monitoring Program. Further, a clear indication regarding whether outcomes align with the predictions made within the Final Environmental Impact Statement must be included. This is required under Appendix D for the post-environmental assessment monitoring program (PEAMP) and may be satisfied through inclusion in the broader PEAMP update required for the Project. The requested information should be provided to the Board within **30 days** following the issuance of this recommendation, and also be included in the **annual reports thereafter**.	Temporal and Spatial Trend Analysis of Water Quality Data – Temporal and spatial interpretation of the water chemistry data is a core component of the annual CREMP. This is done through plots of chemistry parameters, comparison of results relative to trigger and threshold values, and formal statistical analysis of the results in the before-after / control-impact (BACI) study design. The following text (see Section 2.4.1 of the 2017 CREMP) outlines the approach to analyzing and interpreting changes in water quality associated with mining and/or site related activities. The focus of the trend assessment in recent years has been on the near-field locations in accordance with the more focused approach to monitoring developed in the CREMP Plan Update (Azimuth, 2015). Water quality data collected in 2017 were evaluated against triggers and thresholds consistent with the existing framework outlined in the CREMP: 2015 Plan Update (Azimuth, 2015). Formal comparison of the water quality data for decision-making purposes was done by comparing the yearly mean parameter concentrations to the trigger values developed separately for the Meadowbank projects lakes, Wally Lake, and Baker Lake areas. Parameters with yearly mean concentrations equal to or exceeded the trigger value were formally tested using a one-tailed test of the null hypothesis (significance level of p=0.05) according to the framework outlined below for Meadowbank and Baker Lake areas. • Meadowbank Project Lakes and Wally Lake – A Before-After-Control-Impact (BACI) statistical framework was applied. The BACI model is "paired" (i.e., BACIP) when multiple "before" and "after" events are available. In the BACI model, INUG is used as the reference ("control") area, and the other areas are tested as exposure ("impact") areas. Both PDL and TEFF are excluded as control areas in the BACI analysis because neither area was sampled in the "before" period between 2006 and 2008. True "pre-impact" data (i.e., when both INUG and the test area had "control" ("C") status; see Table 1.4 2 2017 CREMP) were used for the "before" data. Only events when both INUG and the test area were sampled in 2017 were used as the "after" data. • Baker Lake – Baker Lake areas were designated as "control" (BAP) or "impact" (BPI and BBD) when sampling started in 2008 (i.e., there was no detailed baseline sampling was conducted for Baker Lake; see Table 1.4 2 2017 CREMP), so there are no true "pre-impact" "before" data. While a spatial "CI" design could be used to test for differences between reference "control" and exposure "impact" areas, the design does not allow for distinguishing natural differences between areas from development-related changes. Given that no development-related changes had been identified to date, all years of data up to and including 2016 were considered in the "before" period while the 2017 results were considered "after" period data (i.e., allowing the more robust BACI analysis). Thus, the BACI analyses specifically looked at changes in 2017 at the two "impact" areas relative to previous years. The first step in the spatial and temporal trend analysis involves identifying the list of parameters that are routinely <MDL. In 2017, just over half (53%) of the parameters exceeded the MDLs at least 10% of the time. These parameters were carried forward for further assessment. The next step involved comparing the detection frequency between control and impact stations to avoid screening out parameters that are infrequently detected but may be associated with mining activities. The proportion of samples exceeding MDLs between "control" and "impact" samples were compared. The intent of this screen was to identify parameters with <10% detection frequency (i.e., those screened out above) for which there were detection frequency changes potentially associated with mining activity (i.e., where the proportion of detected values increased by 0.1 or more). No parameters were added back into the trend assessment based on this second screening level. Lastly, trend plots were used to identify parameters with measured values associated with periods/locations of known mining activities. No parameters were added back into the trend assessment process based on this screen. Results of the spatial and temporal trend analysis are summarized in Section 3.2.2.2 of the 2017 CREMP report (Azimuth 2018). Consistent with recent monitoring cycles, the only trigger exceedances reported in 2017 were for constituent parameters without effects-based guidelines (i.e., parameters without CCME WQGs). Conductivity, alkalinity (total), hardness, and major cations (Ca, Mg, K, Na) have routinely been measured above their trigger values (95th %ile of baseline concentrations) at the near-field stations in more recent CREMP cycles. A thorough review of the significance of each parameter exceeding the trigger value was presented in Section 3.2.2.2. While these parameters, particularly conductivity, hardness, and major cations (Ca, Mg, K, and Na) have exceeded their triggers and are mining-related, it is important to note that they have been fairly stable in more recent years. Furthermore, all available information compiled for the various parameters suggests that the observed concentrations are well below levels of concern for the health of aquatic life. Water Quality vs FEIS Predictions – In addition to the trigger/threshold evaluation, annual CREMP water chemistry data were also compared to the maximum whole-lake average water quality modelling predictions for Third Portage, Second Portage, and Wally Lakes made during the environmental assessment process	Include in the 2018 CREMP Report Table ES-1 and ES-2 (Appendix 31 of the 2018 Annual Report).
NIRB	MBK	2017-18 Annual Monitoring Report for the Meadowbank Gold Project with Board's Recommendations - Noise Quality Monitoring	The Board requests that Agnico Eagle clarify whether an evaluation was undertaken for the noise model and, if so, whether the results were compared to the predictions within the Final Environmental Impact Statement for the Project. The requested information should be provided to the Board within **30 days** following the issuance of this recommendation, and also be included in the **annual reports thereafter.**	The Board requests that Agnico Eagle clarify whether an evaluation was undertaken for the noise model and, if so, whether the results were compared to the predictions within the Final Environmental Impact Statement for the Project. The requested information should be provided to the Board within **30 days** following the issuance of this recommendation, and also be included in the **annual reports thereafter.**	In the Nunavut Impact Review Board's 2015-2016 Annual Monitoring Report for the Meadowbank Gold Project and Board Recommendation response letter dated December 9th 2016, Agnico Eagle committed to evaluate the noise model and predicted impacts within the FEIS. This exercise was subsequently completed in the 2016 Annual report, section 12.3.2. "By monitoring sound levels at five locations around the mine site for two 3-4 day periods annually, the current monitoring program provides a conservative assessment of the accuracy of predicted noise levels. A review of the impact assessment methodology was performed, and it was determined that assumptions of the noise model with respect to site activities remain valid." In relation to the FEIS, noise monitoring results were assessed to be conservative in comparison. Results are also compared annually to the accuracy of predicted impacts in the annual report.	2018 Noise Report in Appendix 44 of the 2018 Annual Report
NIRB	WT	2017-18 Annual Monitoring Report for the Whale Tail Pit Project with Board's Recommendations - Invasive Species Mitigation Plans – Term and Condition 25	Agnico Eagle has not provided an Invasive Species Mitigation Plans, Protocols, Monitoring and Inspection Program as required by Term and Condition 25 of Project Certificate No. 008 to date. This was to be provided to the NIRB for review at least 30 days prior to the first shipment of equipment and supplies to the site. In correspondence received in October 2018, Agnico Eagle indicated that it is working on developing a plan for the 2019 barge season.		Agnico is working on developing a plan for the 2019 barge season. The plan should be submitted in the 2018 Annual Report.	Procedure NU-PRO- ENV- Invasive Species Inspection Prior Loading onto Shipping Vessel in Appendix 49 and 2018 Annual Report Section 8.18.7. Section 3.4 - TEMP Version 6, December 2018
NIRB	MBK - WT	2017-18 Annual Monitoring Report for the Whale Tail Pit Project with Board's Recommendations -	See above comments	The Board requests that **Environment and Climate Change Canada** review the Air Quality and Dustfall Management Plan submitted by Agnico Eagle in June 2018 and provide feedback regarding whether the plan meets the requirements under Terms and Conditions #1 and #2 of Project Certificate No. 008. The Board respectfully requests that Environment and Climate Change Canada provide a response to this recommendation within 30 days' receipt of the Board's correspondence to Environment and Climate Change Canada.	Agnico Eagle look forward to see ECCC response to this recommendation.	Updated Air Quality and Dustfall Monitoring Plan in Appendix 39 of the 2018 Annual Report
NIRB	WT	2017-18 Annual Monitoring Report for the Whale Tail Pit Project with Board's Recommendations -	See above comments	The Board requests that **Crown-Indigenous Relations and Northern Affairs Canada** and **Natural Resources Canada** review the information provided by Agnico Eagle for Term and Condition 10 of Project Certificate No. 008 in relation to the additional site-specific permafrost monitoring mapping and thermal analysis studies and confirm whether the information is complete and that this condition has been satisfied. The Board respectfully requests that Crown-Indigenous Relations and Northern Affairs Canada and Natural Resources Canada provide a response to this recommendation within 30 days' receipt of the Board's correspondence to both Crown-Indigenous Relations and Northern Affairs Canada and Natural Resources Canada.	Agnico Eagle look forward to see CIRNAC and NRCan responses to this recommendation.	Thermal Monitoring Plan Version 2 March 2019 - Appendix A; Thermal data analysis included in this Appendix. 2018 Annual Report Section 5.4.2

GN	MBK	App G13-2017 Wildlife Monitoring Summary Report	In section 3.7 of the Wildlife Monitoring Summary Report, the Proponent has identified that habitat loss "as result of mine site construction to date was 17.8% higher than the FEIS predicted". The Proponent outlines its management recommendations in section 3.8 of the Wildlife Monitoring Summary Report stating that measures "may involve removal of contaminated soil, placement of stockpiled native soils, reseeding (e.g., native-grass cultivars and forbs such as nitrogen-fixing legumes) and transplanting of vegetation". The Proponent only provides vague descriptions of its possible adaptive management practices. The GN cannot evaluate the Proponent's methods without a clear description of what the Proponent intends to undertake in response to the habitat loss exceedances. Table 3.4 lists under its "Adaptive Management Implemented" column that management for terrestrial habitat loss is "to be determined following a more inclusive habitat analysis in the 2018 annual report". Waiting until after the 2018 annual report causes an undesirable full year delay in the implementation of management actions. Habitat loss poses a risk to grazing species such as caribou and muskox in Nunavut. Both of these species are important both economically and culturally to Nunavummiut.	The GN recommends that the Proponent conduct an inclusive habitat analysis at the earliest possible date and, in coordination with the GN, develop and implement specific adaptive management measures relating to the exceedances of habitat loss at the Project site.	Agnico will be completing a comprehensive habitat analysis for the 2018 annual report, which will include all habitat alterations due to mine activities up to December 2018. The ground analysis could not be conducted for the 2017 annual report because the necessary geospatial data (e.g., actual and approved losses of the Phaser Lake extension) were not available. Section 3.6.1 of the annual report indicates, "The Phaser Lake extension was completed with approval from the NIRB and the Nunavut Water Board (NWB); however, the size of the extension area was not available for habitat calculations in this report." Further, Section 3.8 notes, "To better understand the extent of exceedances, all approved mine components (e.g., Phaser Lake extension) need to be included in the habitat analysis. An updated habitat assessment, with all approved extensions, will be included in the 2018 annual report."	A complete habitat analysis can be found in Section 5, Wildlife Habitat Monitoring of the 2018 Annual Report (Appendix 45). Details on habitat losses relative to permitted areas can be found in Table 5.3 (Meadowbank habitat loss), Table 5.4 (Meadowbank high suitability habitat losses for wildlife VECs), Table 5.5 (Whale Tail Pit and Haul Road habitat loss), and Table 5.6 (Whale Tail Pit and Haul Road high suitability habitat losses for Ungulates)
GN	MBK	App G13-2017 Wildlife Monitoring Summary Report	The Proponent has stated in the executive summary of their Wildlife Monitoring Summary Report that: "Collared Caribou were present predominantly during the fall rut, with some minor presence in late summer, fall, and early winter. . . . No collared Caribou moved around or across the Meadowbank RSA during spring migration." GN telemetry data shows multiple collared caribou moved across the regional study area (RSA) and all weather access road (AWAR) during the month of May (see Figure 1). The statements in the executive summary are also inconsistent with those in Section 6.5.4 Caribou and Muskox Protection which states that "[g]roups of 20 or more animals [caribou] were observed at the mine site near the Amaruq Road area in mid-April and early May". Caribou are a key species in Nunavut ecologically, economically, and culturally. The accurate reporting of caribou movements by project proponents is essential to the continued sustainable management of caribou in Nunavut.	The GN requests that the Proponent update its Wildlife Monitoring Summary Report to reflect the movement of collared caribou across and around the Project RSA during the spring migration period.	Figure 1 provided by the GN for Recommendation 4 refers to caribou collaring data from May 2018, which will be summarized and discussed in the 2018 annual report.	Details on Caribou satellite-collaring program results for 2018 can be found in Section 6 of the 2018 Wildlife Summary Report (Appendix 45) of the 2018 Annual Report. Details on spring collared Caribou movements are illustrated in Figures 6.2, 6.3, and 6.8 while a discussion is provided in Section 6.6 of the Wildlfie Report.
GN	MBK	1.6 Appendix G13-2017 Wildlife Monitoring Summary Report	Section 6.5.5, Predatory Mammal Deterrence and Protection, of the Proponent's Wildlife Monitoring Summary Report describes the Proponent's practices surrounding the deterrence of predatory wildlife on and around the Project site. The Proponent states that as part of their predator deterrence practices "[n]otices were sent out on a weekly basis to Meadowbank employees regarding the presence of wildlife". A weekly notice is not sufficient to ensure employees are aware that potentially dangerous wildlife is in the area. Wildlife may pose a problem almost immediately after arrival to the regional study area (RSA). The use of immediate site notifications and alerts when predator wildlife is spotted is far more effective for rapid response and deterrence. Section 6.5.5 also describes an incident in which an injured wolf was observed along the Amaruq road. The Proponent states The following morning, the Wolf was found dead, presumably killed by a Wolverine (Appendix C). The Wolf appeared to have an injury to the head, and many Caribou tracks were observed in the immediate area; therefore, this mortality is assumed to be unrelated to mine and road operations. The Proponent's evidence – namely, the presence of caribou tracks and a head injury with unknown causes – cannot be used to support the conclusion that the mortality was not Project related. The wolf in question may have moved to the location after the described injury. The Wildlife Monitoring Summary Report does not provide a cause for the head injury or include if the cause of said head injury was investigated. The wildlife incident report in Appendix C of the Wildlife Monitoring Summary Report states that "the injured wolf was first seen at km 8 and walked his way to km 6.5", indicating that the wolf was active and moving prior to being sighted and arriving at the location of its death. Appendix C of the Wildlife Monitoring Summary Report also describes a January 12th incident in which a wolverine was run over and fatally injured by a Project pickup truck. This incident is further detailed in MEMO – 20170113 Environmental Incident at Meadowbank Mine. The sex of the animal was not reported upon the removal of the animal's remains. Predatory mammals - in addition to being important furbearers for the Nunavut economy - represent a threat to the health and safety of project personnel. Every attempt should be made regarding adequate monitoring and deterrence methods to ensure the safety of both wildlife and Project personnel. Rapid alerting of personnel to the presence of wildlife is integral to human and animal safety and all measures to alert site personnel quickly should be taken. Accurate tallying of wildlife mortality with details of demographic parameters including sex is integral to analyzing Project effects. Where the cause of mortalities can only be assumed, a cause of death should be listed as "undetermined". Recommendation 9: The GN recommends that the Proponent update its predatory mammal deterrence protocols to include the immediate issuance of a site alert to personnel when carnivores are sighted in and around the project area. The GN also recommends that the Proponent amends Appendix C of the Wildlife Monitoring Summary Report, Wildlife Mortality Report to include the sex of deceased animals.	The GN recommends that the Proponent update its predatory mammal deterrence protocols to include the immediate issuance of a site alert to personnel when carnivores are sighted in and around the project area. The GN also recommends that the Proponent amends Appendix C of the Wildlife Monitoring Summary Report, Wildlife Mortality Report to include the sex of deceased animals.	When predators are observed in the vicinity of the mine, Agnico notifies and alerts Environment Section staff and department heads immediately and during daily meetings. To avoid personnel from going to view predators out of curiosity and to minimize predator/human interactions, mine-site wide notifications to all staff are not provided. This policy was not explicitly stated in the 2017 report; therefore, appropriate changes will be made to the 2018 annual report to reflect Agnico's approach to predator notification. The Wildlife Protection and Response Plan (TEMP, Appendix C) was updated in June 2018. This plan included a section regarding the responses to different levels of encounters. Further, when possible, details on apparent cause of death and demographics of dead/killed wildlife will be collected and reported in subsequent mortality and annual reports. In relation to the recommendation on Appendix C, Agnico will update to include the sex of deceased animals, when a clear determination is possible to the best of the Environmental staff knowledge. If any doubt, or if unclear, sex will be entered as 'undetermined'.	Details on wildlife notifications are described in Section 4 of the wildllife report summary report with specific details are provided in Section 4.4.2 Incidental Mine Site Wildlife Observations and Section 4.7 Management Recommendations. Most importantly, changes have been made to the Wildlife Protection and Response Plan of the TEMP regarding responses to different levels of encounters.
GN	MBK	App G13-2017 Wildlife Monitoring Summary Report, AEM 2017 Meadowbank Gold – 2017 Annual Report, Terrestrial Ecosystem Management Plan Version 5, June 2018	The Project has the potential to affect wolverines through direct and indirect loss of habitat, mine related mortality (attraction and vehicle collisions) and sensory disturbance. The threshold level of mine related mortality for predatory mammals is one per year. Appendix G13 describes mine site ground surveys used to verify if mitigation measures are successful in maintaining the allowable mortality rate of one or less individuals per year. The assessment of Project sensory disturbance and direct impacts on habitat are not provided as part of the monitoring program. The Proponents 2017 wildlife reporting log states 104 wolverine sightings (about 9 wolverines per month, with highest numbers in January =17) were reported in the Project areas. Wolverines are solitary carnivores but observations of group of 4 to 5 animals were reported at the landfill/dumpsite. This is an indication that mitigation measures to deter wildlife, in particular wolverines, from the site are not working as intended. Given the high occurrence of wolverine, the Government of Nunavut (GN) feels that surveys to assess wolverine distribution and habitat, along with a reexamination of the Proponents wildlife deterrence measures regarding Project waste are prudent. The GN is responsible for the management of terrestrial mammals in Nunavut. Predatory mammals are susceptible to loss of denning habitat, and sensory disturbance associated with project construction and operation. Predatory mammals are also prone to attraction to project sites through human waste and strange smells associated with project activities. Wolverine are an important cultural and economic resource for Nunavummiut. The Canada population of wolverine is considered a species of special concern by Committee on the Status of Endangered Wildlife in Canada (2014). The distribution and abundance of wolverines are affected by the trends in caribou populations. Wolverine, as a resident species, may be considered an indicator of ecosystem status. As required by the Project Certificate Term and Condition No. 54, the Proponent shall provide "statistical validation to support the conclusions drawn from monitoring impacts of the mine and infrastructure on wildlife"	Given the high occurrence of wolverines at the mine sites, the Proponent should conduct surveys on wolverine distribution and habitat use, in order to properly assess the impact to local population for the required mitigation and monitoring needs	Agnico Eagle's intent is to operate as per the TEMP Version 5, June 2018. This version was completed in collaboration with GN Biologist. As per this version, Agnico Eagle reported all wolverines sighting in the 2018 Wildlife Annual Report.	Refer to 2018 Wildlife Summary Report in Appendix 45 of the 2018 Annual Report
GN	MBK			As required by the Project Certificate Term and Condition No. 54, the Proponent shall provide "statistical validation to support the conclusions drawn from monitoring impacts of the mine and infrastructure on wildlife" as it applies to wolverine	Agnico Eagle acknowledges GN's comment and will provide the requested information in the 2018 Annual Report.	Agnico Eagle acknowledges GN's comment and has attempted to respond to the requested information in the 2018 Annual Report (see Section 4, Tables 4.3 and 4.4 of the 2018 Wildlife Sumamry Report (Appendix 45)). Please note however that 'statistical validation' is not possible given the overall low numbers of Wolverine occurrences and very low mine-related mortalities. Wolverine mortality has been below the established mortality thresholds of two (2) individuals per annum since 2007. Additional information has been provided in the 2018 Wildlife Summary Report. The overall number of deterrence activities for wildlife, including Wolverine, has been summarized in Section 4, Table 4.3. Although the number of deterrence efforts increased in 2018, the number of mine-related Wolverine mortalities remained low in 2018 (see Table 4.5) and are below threshold mortality levels of two (2) individuals.

GN	MBK	AEM 2017 Meadowbank Gold – 2017 Annual Report Appendix J7, Socio-economic Monitoring Report page 21 and page 65	in Appendix J7 the Proponent outlines data respecting turnover rates at the mine site. the Proponent states: Since 2010, turnover rate for permanent Inuit employees has been consistently higher than that for permanent non-Inuit employees (approximately four to six times higher over the past four years). The turnover rate for permanent Inuit employees increased to 28% in 2016, up from 21% in 2015 but approximately the same as in 2014 (26%). Of note is the number of dismissals in 2016, which increased to 54 from 24 or lower in all years prior. The drop in the temporary & on-call Inuit employee turnover rate between 2010 and 2013 is likely due the [sic] shift of temporary employees away from set-contracts (contracts with a defined end-point which therefore manifest as turnover) towards on-call temporary employees. These employees now have an indefinite contract and are called upon when the need arises. This turnover rate increased to 59% in 2016 from a low of 43% in 2015. On page 65 of the Annual Report, the Proponent sets out its predictions from the FEIS: In terms of positive impacts on social services, the FEIS also describes how increased economic security and well-being may reduce dependence on social services, understood to also include social assistance payments: "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." These predictions have not been realized. The high turnover rate suggests economic insecurity amongst Inuit employees. However, despite this there has been an overall decrease in dependency on social assistance since the mine opened. The Proponent concludes that there is still significant need for social assistance in the Kivalliq region. Although there have been declines in the overall reliance on social assistance, as compared to historically high requirements in 2007, there is no clear correlation between these declines and Meadowbank-related employment: The proportion households [sic] receiving social assistance increased gradually between 2011 and 2015 (from 24% to 34%), but has remained below 2007 levels. … Despite declines from historical highs, social assistance data does not show a clear correlation between Meadowbank-related employment and social assistance requirements in Baker Lake or Arviat. Data suggests that both expenditures and percentage of households receiving social assistance have been declining in Rankin Inlet since the mine opened (s. 9.4.3). Turnover rate alone does not appear to fulsomely address questions about economic security. In addition to turnover rates, an analysis prefaced on the length of services of Inuit employees would provide more complete data to address issues related to social assistance and economic security.	The GN recommends that the Proponent also include average lengths of service for Inuit employees in future annual reports as a more accurate reflection of economic security.	Agnico will include average lengths of service for Inuit employees in future annual reports, by skill level.	This will be part of the 2018 Socio-Economic Monitoring Report to be submitted after 2018 Annual Report submission
CIRNAC	MBK	General Comments	As was noted by CIRNAC in their reviews of previous Annual Reports (2015 and 2016), it is sometimes difficult to ascertain the status of activities proposed by AEM and to track the implementation of recommendations made by regulators within the Annual Report and/or supporting documents. This is due to the vast amount of information that is presented, the differing timeframes of the various supporting reports, and the fact that a particular topic is discussed in multiple sections of the Annual Report.	CIRNAC recommends AEM develops and includes a table to track proposed activities and recommendations presented within the Annual Report and supplementary documentation appended to the Annual Report. Such a table would help to ensure the follow up of potential issues, such as information regarding whether a recommendation was adopted, how it was implemented and/or the rationale as to why a recommendation was not considered.	Agnico acknowledges CIRNAC comments and will determine the best way to introduce a table to track authorities' recommendations in the 2018 Annual Report.	Done via the current table- Table 1.3
CIRNAC	MBK	Quarries	The degradation of petroleum hydrocarbon (PHC) contamination in Quarry 22 is discussed on page 17 of the 2017 Annual Report where AEM states that "Based on the degradation history of PHC's in the Meadowbank Landfarm and upon results from the 2014 and 2016 Q22 soil sampling, Agnico Eagle is confident that the natural degradation of Petroleum Hydrocarbon related products is an effective remediation method for Q22". The 2017 Annual Report does not present historical PHC degradation data and trends to support this assertion.	CIRNAC recommends that AEM presents the data and information on historical PHC degradation at the Meadowbank Landfarm that corroborates these conclusions.	Agnico acknowledge CIRNAC comments and will present the historical PHC degradation results in the next annual report.	See Appendix 12 - 2018 Q22 Report Section 3
CIRNAC	MBK	Lake Level Monitoring	Changes in lake levels in Turn Lake, resulting from diversions involved in the Phaser Lake dewatering, do not appear to have been measured/reported in 2017, as well as in previous year (2013-2016). Thus, comparisons to FEIS predictions were not provided in the 2017 Annual Report.	CIRNAC recommends that AEM provides an explanation as to why Turn Lake water levels are not being monitored, reported and compared to FEIS predictions.	Agnico acknowledges an oversight was made in the level monitoring work plan; thus Turn Lake was involuntarily not included in the level measurements program. Agnico will ensure, moving forward, that Turn Lake water level monitoring in the next open water season will be completed, reported and compared to predictions.	Section 4.2.1 of the 2018 Annual Report
CIRNAC	MBK	Lake Level Monitoring	Table 4.2 reports separate lake level measurements for Ponds B, C and D in the Vault Attenuation Pond; however, there is mention of only one monitoring location for the Vault Attenuation Pond, station VN-IN which is established in Pond B (shown on Figure 3). Thus, it is not clear how measurements were obtained for Ponds C and D.	CIRNAC recommends that AEM clarifies the methodology by which lake level measurements were obtained for Ponds B, C, and D of the Vault Attenuation Pond.	All the pond elevations provided are taken by Agnico surveyors using a surveying GPS. A map with labelled ponds will be added to the 2018 annual report.	See Figure 3 of the 2018 Annual Report
CIRNAC	MBK	Predicted vs. Measured Water Quality	As per the recommendation made by CIRNAC in their review of the 2016 Annual Report, in the 2017 Annual Report, AEM used one consistent methodology to calculate the percent (%) difference between predicted and measured data for both water quantity and quality. The methodology is clearly explained and the comment has been addressed. While the results of predicted vs. measured comparisons (average and lower 25th percentile) for both scenarios (Probable and Probable Poor End) are provided in the 2017 Annual Report for each pit (North Portage Pit [ST-17], Third Portage Pit [ST-19], Goose Pit [ST-20], and Vault Pit [ST-23]) in paragraph form for each year for the period 2012-2017, the manner in which these data are presented makes it difficult to decipher any temporal trends. Further, no discussion of temporal trends is included in the text. Presenting these data in a tabular or graphical format would provide a more effective means of deciphering water quality trends over time.	CIRNAC recommends that predicted vs. measured water quality parameter comparisons be presented in a tabular or graphical format. A table could be prepared with the pits and successive monitoring years appearing in the rows and the average/lower 25th percentile results with >20% difference summarized in the columns for each scenario. A year to year comparison for each pit could then be made by moving down each column. Alternatively, time series plots could be prepared for each pit and parameter exhibiting >20% difference that would show how concentrations are evolving over time. A plot will also show if the magnitude of the divergence is increasing or decreasing over time.	For the 2018 annual report, plots comparing the predicted water quantity and quality over time will be produced. The predicted values will be plotted as line graph and compared to the actual data presented as a bar graph.	Section 4.4.3 and Figure 9 - 12 of the 2018 Annual Report
CIRNAC	MBK	Waste Rock Volume	CIRNAC recommended the following during their review of the 2016 Annual Report; "To facilitate review and understanding of the progression of the work, INAC recommends AEM provides a comparison of the volume generated annually with the FEIS predictions and discusses how the results might warrant re-evaluation of the Waste Management Plan with regards to the design of the Waste Rock Storage Areas and the capping requirements for closure." In their response to CIRNAC, AEM noted that the Waste Rock and Tailing Management Plan will continue to be updated yearly with current production quantities and Life of Mine, and will be presented in the 2017 Annual Report, including a discussion on material balance and material quantity required for closure Non-Acid Generating (NAG) cover, and a comparison of the volume generated with FEIS predictions. This commitment was partially fulfilled in the 2017 Annual Report, but a comparison of the volume generated annually to FEIS predictions was not included.	CIRNAC recommends that AEM provides a comparison of the volume of waste rock generated annually to FEIS prediction.	Agnico acknowledges CIRNAC comments and the requested information will be integrated into the 2018 annual report.	Table 3-4 of the Waste Rock and Tailings Management Plan found in Appendix 17 of the 2018 Annual Report

CIRNAC	MBK	Tailings Freezeback and Capping Thickness	Section 5.3.2 of the 2017 Annual Report reports on the monitoring of the freezeback efficiency and the permafrost monitoring program. This section has the same format and discussion as the 2016 Annual Report. CIRNAC's comments on the 2016 Annual Report are repeated below as they have been not been addressed by AEM's response and remain valid comments on the 2017 Annual Report and Appendix D1 Mine Waste Rock and Tailings Management Plan. "The results from thermistors readings are presented, but AEM does not present a discussion of these results and how they are integrated in the update of the Waste Rock and Tailings Management Plan. Section 2.1.4.3 of the "Waste Rock and Tailings Management Plan" (Appendix D), which discusses climate change and permafrost contains several error messages and repeated information that appears to be formatting issues. There is no further discussion on the results of the current monitoring and how they compare with the thermal modeling used for conceptual freezeback and capping plans presented in the FEIS. Under section 7.3 of Appendix D (Tailings Reclamation), a short discussion is presented on the design of the Tailing Storage Facility at closure. AEM states "Tailings material, beneath the minimum 2.0 m thick cover, appears to remain frozen for all years (excluding the warmest years) from the 100-year database, accounting for climate change". However, no results are presented and no details are given on the type of climate change scenario utilized, the data considered, and the model methodology. It is unclear if this conclusion is based on monitoring results from the thermistors, and how this compares with values predicted in the FEIS.	INAC recommends AEM includes a meaningful discussion of the results from the permafrost monitoring in the Annual Report. FEIS predictions should be compared with monitoring results and be clearly presented. AEM should present the updated modeling supporting their conclusions that the conceptual plans for thermal encapsulation of the Tailing Storage Facility and the Waste Rock Storage Facility remain effective to prevent and control deleterious seepage over long term. Finally, if results show discrepancies from the predicted values, AEM should discuss the management actions that should be implemented to address the risk."	In the 2018 annual report, the current performance will be evaluated and compared against the FEIS.	Section 7-2 of the Waste Rock and Tailings Management Plan found in Appendix 17 of the 2018 Annual Report. Mandate with consultant ongoing - more details to be provide in future annual report
CIRNAC	MBK	Tailings Freezeback and Capping Thickness	Section 5.3.2 of the 2017 Annual Report provides a sub-section entitled Summary of Ongoing Field Trials. This section refers to work carried out in collaboration with the Research Institute of Mines and Environment (RIME) on three experimental cells and notes that the results have been used so far on the cover design of TSF North and South Cell, that data collection is still ongoing and that results will be used in future studies as needed. Similarly, it notes that RIME has carried out laboratory tests of soapstone to evaluate its resistance to freeze/thaw (F/T) and wet/dry (W/D) cycles and concludes that soapstone has good resistance to F/T and W/D cycles. However, no details or results are provided on either the experimental field cover cells trials or the laboratory F/T, W/D cycle tests.	CIRNAC recommends that AEM provides more information on the nature and extent of research efforts, results of the research and a discussion of how the proposed cover design has been influenced by these results.	Agnico acknowledges CIRNAC comments and the requested information and discussion will be integrated into the 2018 annual report.	Section 5.4.1 of the 2018 Annual Report
CIRNAC	MBK	Monitoring	The objective of Section 8 of the 2017 Annual Report is to present the results of the various monitoring programs included under the Aquatic Effects Management Plan (AEMP). As such, a lot of information is discussed in this section and a total of 74 tables summarizing data are cited in the text. However, only twelve (12) of these tables have actually been included in the report making it difficult to assess the results and confirm AEM's conclusions.	While the information is available elsewhere in supporting documents, if tables are referenced within the text of the report as being part of that section, CIRNAC would expect that they would appear in that section of the Annual Report.	Agnico will continue to improve the visual presentation of Section 8 and add some of the tables from Appendices to facilitate the interpretation of the annual report. Also, reference to the appendix where the table can be found will be added in the 2018 annual report.	Section 8 of the 2018 Annual Report
CIRNAC	MBK	Portage Rock Storage Facility (ST-16)	Tables 8.21 to 8.24 of the 2017 Annual Report summarize monitoring results for station ST-16, a sump area along the east base of the Portage Rock Storage Facility (RSF), and stations downstream in the receiving environment in NP-2 Lake (South, East, West, Winter), NP-1 Lake (West), Dogleg Lake (North), and Second Portage Lake (RSF Seep) for monitoring years 2014 to 2017, respectively. Parameters reported include Cyanide (CN Total, CN Weak Acid Dissociable [WAD], and CN Free). This monitoring is conducted in accordance with the 2017 Freshet Action Plan to contain and monitor seepage from the North Cell Tailings Storage Facility (TSF), which in 2013 migrated below the Portage RSF to the sump area at ST-16. It is noted after Table 8.24 that, "the KIA requested that Agnico continue monitoring until there is a 5 year period of non-detect cyanide results. To date (previous 4 years) the monitoring has indicated no CN levels in NP-2, NP-1 and downstream lakes, Dogleg and Second Portage. Thus the current program will continue in 2018. In 2018, Agnico will assess the data after the sampling season as required." It is not apparent from Tables 8.21 to 8.24 that CN levels have not been detected in lakes NP-2, NP-1, Dogleg and Second Portage in the previous 4 years (2014-2017). According to the table notes, values presented in bold correspond to half detection limits, and so presumably, values presented in bold represent non-detect values. Based on this interpretation, detectable levels of all CN forms were measured in NP-2 and NP-1, and CN WAD and CN Free in Dogleg and Portage in 2014 and CN Total and CN WAD in all lakes in 2017.	CIRNAC recommends that AEM clarify the statement "To date (previous 4 years) the monitoring has indicated no CN levels in NP-2, NP-1 and downstream lakes, dogleg and Second Portage" and confirm the cyanide results.	Values in bold are values below the accredited laboratory detection limit. For statistical purposes, and according to standards, Agnico considers those values be half the detection limit. Agnico does not consider those values to mean that no CN is present. The sentence where Agnico indicated that no CN levels would refer to the fact that the yearly average does not exceed the CCME guideline, the MDMER or Water License limit for effluent discharge into the environment. In the 2018 Annual report, the text will be corrected to avoid confusion.	Section 8.5.3.1.7 of the 2018 Annual Report
CIRNAC	MBK	All Weather Road (AWAR) and Quarries	Section 8.3.5 of the 2017 Annual Report notes that a geotechnical structural inspection of the AWAR, including all culverts, bridges and quarries, was conducted by Golder in 2017. The findings and recommendations along with AEM's responses are discussed in Appendix B1. For ease of reference it is noted that Golder recommendations included: a) expansion of the monitoring program to ensure that all culverts provide adequate capacity for the freshet and following large storm events; b) monitoring progression of erosion of culverts PC-17A (8+830), PC-11 (39+552), R14 (67+840), R18-B, R-20 (85+490), R-23 (93+600), and R24 (98+100) at freshet for any signs of progression or washout, as signs of water flowing beneath the road were observed at these locations; c) monitoring is recommended to see if flow occurs through the culvert (i.e., during the freshet) with particular attention paid to R-00A (km 2+550), the culvert at 5+700, PC-14 (km 4+260), and PC-16 (km 54+950). AEM responses essentially indicate that they believe the existing monitoring program addresses these recommendations. This should be confirmed in the next annual report.	CIRNAC recommends that it would be constructive if AEM were to develop and include a table to track proposed activities and recommendations presented within the Annual Report and supplementary documentation appended to the Annual Report. Such a table would help to ensure the follow up of potential issues, such as information regarding whether a recommendation was adopted, how it was implemented and/or the rationale as to why a recommendation was not considered.	Agnico acknowledges CIRNAC comments and will determine the best way to introduce a table to track authorities' recommendations in the 2018 Annual Report as detailed in Recommendation 1. In Agnico's view, this table may include commitments done in responses to NIRB/NWB recommendations/comments, during the review of any management plan or in any other official communication or regulatory process. For now, Agnico does not see the necessity to include in the table all the proposed activities provided in the supplementary documentation appended to the Annual Report.	Done via the current table- Table 1.3

CIRNAC	MBK	Progressive Reclamation – Mine Site	Section 9.1.1 of the 2017 Annual Report generally discusses the status of current reclamation plans and progressive reclamation carried out to date at a high level. The information is consistent with general plans and principles outlined in other portions of the document and the FEIS. No mention is made of potential implications of updates to Life of Mill plan if ore is milled from additional pits elsewhere, and what if any implications this may have on planned progressive reclamation. In terms of progressive reclamation progress, the only numeric value provided is that of 86% of the Portage PRSF had been covered to end of January 2017. We would have expected that AEM would have provided more details than this with respect to the status of progressive reclamation at the mine site (e.g., areas of TMF and WRSF facilities covered in 2017 and total areas to date, along with the volumes associate with these areas). It is noted by AEM that the Interim Closure and Reclamation Plan (ICRP) will be updated in 2018.	CIRNAC expects that 2018 updates to ICRP will include more details on progressive reclamation such as: areas of TMF and WRSF facilities covered in 2017 and total areas to date, along with the volumes associate with these areas, amongst others.	The 2018 ICRP update was submitted to NWB on August 22, 2018. Following the authorities' review period of this plan, no comments were received regarding the current CIRNAC's recommendation. In this 2018 updated version, information regarding the progressive closure of TSF and WRSF can be found Section 6.2 of the report, however it does not included all the details requested by CIRNAC. Agnico may consider adding some of this information in the next ICRP revision. The annual report will continue to include detailed progressive closure completed during the year.	Section 9 of the 2018 Annual Report No new version of the ICRP since the comment was emitted
CIRNAC	MBK	Inspections, Compliance Reports and Non-Compliance Issues	Section 11.3 of the 2017 Annual Report discusses inspections that have occurred during the year. In some cases, it is clearly stated by AEM that no issues were identified. In other cases, AEM simply refers the reader to the Appendix of the report.	CIRNAC recommends that AEM provides a summary statement on findings of all inspections and if and where necessary, provide a list of issues that have been identified and the status of these issues.	It is Agnico's intent to refer directly to the full investigation reports to capture the whole essence of the interpretation of the reports. It is also Agnico's belief that a summary is already provided of the inspections completed in the year. However, Agnico will continue to improve information reported in this section in future annual reports.	Section 11.5 of the 2018 Annual Report
CIRNAC	MBK	Post-Environmental Assessment Monitoring Program (PEAMP) – Evaluation of Impact Predictions	In their review of the 2016-2017 Annual Monitoring Report, the NIRB required AEM to "provide a full discussion and summary on the post-environmental assessment monitoring program for the Project. This must include a discussion that references the baseline and previous years' monitoring data and further indicates whether any trends have been observed at the mine site for each Valued Ecosystem Component where an impact has been observed. The discussion should include whether any identified trends of effects over time are indicating the potential for impacts from or associated with the Meadowbank Project." In Section 12 of the 2017 Annual Report, AEM states that a discussion of year-to-year trends is provided for any monitoring components where an exceedance of impact predictions was observed. For example, an assessment of historical trends was conducted for large predatory mammal mortality since such mortality in 2017 occurred beyond FEIS thresholds. Since AEM concluded that observed impacts to water quantity, water quality, fish and fish habitat measured in 2017 are within the FEIS predictions or are not expected to result in adverse environmental impacts, trend analyses were not presented for any components of the aquatic environment. While the concentrations of conventional water quality parameters that exceeded trigger values were deemed to be low and with a low likelihood of adverse effects on aquatic life, these parameters may eventually become problematic if their concentrations are increasing over time which is why a trend analysis is needed. Data comparisons and interpretations presented for the PEAMP continue to be limited to those between current conditions (2017) and FEIS predictions.	CIRNAC recommends that AEM includes a temporal analysis identifying trends over time in the data interpretation.	It is Agnico's belief that a comprehensive update is not warranted as part as the PEAMP. According to the proponent's responsibilities identified under Appendix D of the Project Certificate, examinations are provided as required in individual monitoring reports. As such, trending analyses would also not be required under the aforementioned responsibilities. Agnico is confident that these discussions reference any potential impacts observed. In addition, the annual report is based on an extensive review of the FEIS throughout its content. Nonetheless, Agnico, is committed on improving identification of noted effects within the PEAMP summary report in this section and intends to highlight any trends observed for VEC's exceeding predictions with the 2018 Annual report and moving forward.	Section 12 of the 2018 Annual Report.
CIRNAC	MBK	Term and Condition No. 68	Cumberland shall, in consultation with Elders, local Hunters and Trappers Organizations (HTOs) and the Meadowbank Gold Mine Socio-economic Monitoring Committee (SEMC), demonstrate that they are working toward incorporating Inuit societal values into mine operation policies. Although AEM has confirmed its commitment to consulting with Elders, local HTOs, and the Kivalliq SEMC on mine operations as referenced in Section 11.6 of the 2017 Annual Report and Appendix J6, it is difficult to ascertain that policies and management plans are being reviewed and modified to incorporate Inuit societal values.	CIRNAC recommends that AEM demonstrate that it is regularly consulting with Elders, local HTOs, and the Kivalliq SEMC with the aim of incorporating Inuit society values into mine operation policies. A record of decisions and perhaps a policy on how Inuit societal values are to be adhered throughout mine operations should be included in future annual report submissions.	Agnico can demonstrate through more detailed record of consultation on mine operation policies in future reports, showing a record of review and decisions, if applicable.	Refer to Appendix 56 - Consultation of the 2018 Annual Report
CIRNAC	MBK	Appendix A: Edits and Omissions	CIRNAC noted that as new information is added to the end of each section with each iteration of the Annual Report, sometimes there becomes a disconnect in the flow of information presented and in other instances the new information repeats or contradicts what was stated previously (e.g., top of page 27).	CIRNAC recommends general editing to improve upon information flow during subsequent annual report revisions.	Agnico acknowledges CIRNAC comment and will work on improving the flow of information within future annual reports.	All Sections of the 2018 Annual Report
CIRNAC	MBK	Appendix A: Edits and Omissions	Some of the site maps (e.g., Figures 1 to 4) are of poor quality, outdated and missing features (e.g., locations of Landfarms 1 and 2, Saddle Dam 5) and could be replaced with maps and figures presented in appended reports, which show areas in more detail. In addition, it is noted that the 2017 Annual Report does not contain photographs of site features which would be helpful in discussions of some of aspects of the site conditions	CIRNAC recommends that AEM update the referenced maps in future reports.	Agnico acknowledges CIRNAC comment and will provide updated maps in the 2018 annual report.	See Figure 1 to 6 in the 2018 Annual Report
CIRNAC	MBK	Appendix A: Edits and Omissions	The report seems to be written with the assumption that the reader is already familiar with the site and the various aspects of the operation, and thus provides little background information for context. Although much of this information was found in the supporting documents, it would be helpful if some relevant background information was added to the Annual Report (e.g., a brief overview of the site and mining operations).		Agnico acknowledges CIRNAC comment and will review how the next annual report can be improved. Agnico wants to remind that the annual report summarizes most of the information requested. Full details and background are to be found in each of the appendices individually.	Section 1 of the 2018 Annual Report
CIRNAC	MBK	Appendix A: Edits and Omissions	There are many instances where Sections (e.g., Section 8.3.7 and sub-sections), tables or figures are numbered incorrectly either in the caption (e.g., Figures 39 and 40) or as referenced within the text. Also, many tables (e.g., Tables 1.1, 1.2, 8.1-8.20, 8.25-8.62, 8.64-8.66, and 8.74) and figures (e.g., figure referred to on page 154) are referenced in the text but are not included anywhere within the report. Many tables (e.g., Tables 8.69-8.71 summarizing results from the CREMP) and figures (e.g., Figures 5-12 summarizing thermistor results; Figure 34 showing sub-landfill location) are also difficult to read due to their sizing (i.e., the text/images are too small to read or of poor quality).	CIRNAC recommends that AEM improves upon the quality of tables and figures and ensures that all referenced tables and figures are included in the annual report.	Agnico acknowledges CIRNAC comment and will ensure that all tables/figures are correctly referenced in the text. Agnico will continue to add some of the tables and Figures in Appendices to ease the comprehension of the annual report. Also, reference to the appendix where the table can be found will be added in the next 2018 annual report.	All Figures/Tables of the 2018 annual report Appendix 1 for all Table not introduced directly in the 2018 Annual Report
CIRNAC	MBK	Appendix A: Edits and Omissions	Terminology or nomenclature used is not consistent between the various documents, so when information is copied directly into the Annual Report from supporting documents it is often not clear what is being described and discussed. For example use of terms north and third portage pit vs. pits A, B, C, D and E to describe areas and monitoring locations within the Portage Pit; Stations TPN, TPE, SP, WAL are referenced in the CREMP but not described in the Annual Report or shown on any figures.	CIRNAC recommends that AEM uses consistent terminology, when referring to mine pits or other structures, within the annual report and related documents.	Agnico acknowledges CIRNAC comment and will improved the consistency of terminology in the next annual report. The abbreviation list at the beginning for the annual report was created to avoid this kind of confusion.	All Section of the 2018 Annual Report
KIA	MBK	General	Several reports are cited in the text which are not part of the accompanying appendices (e.g., Physical Environment Impact Assessment Report 2005; Cumberland 2006; Golder 2007; SNC 2013) and there is no Reference section at the end of the report providing details on these reports.	Please provide a Reference section at the end of the report and linkages to source documents.	Agnico will add a reference section in the next annual report. Reports included in the reference section will be provided on request.	Section 13 of the 2018 Annual Report

KIA	MBK	Section 1: Introduction	The 2017 Annual Report addresses reporting requirements under the following authorizations: • NWB Type A Water License 2AM-MEA 1525; • NIRB Project Certificate No. 4; • DFO HADD Authorization NU-03-190 AWAR; • DFO HADD Authorization NU-03-191 Mine Site; • DFO Authorization NU-14-1046 Phaser Lake; • INAC Land Leases 66A/8-71-2 (AWAR) and 66A/8-72-2 (AWAR Quarries); and • KIA Right of Way KVRW06F04. AEM notes that reporting requirements for the Metal Mining Effluent Regulations (MMER) were submitted directly to Environment and Climate Change Canada (ECCC). We request that copies of these reports also be provided directly to the Kivalliq Inuit Association (KIA).	AEM should provide copies to the KIA of all MMER reports submitted to ECCC.	Agnico reported data to Environment and Climate Change Canada (ECCC) via the RISS electronic database reporting system. All of this reported data were part of the annual report and will continue to be included. As required by ECCC, a Biological Monitoring Study (EEM Study Design 3) was conducted in 2017 to assess the Wally Lake (Vault Discharge). The study design was submitted to ECCC on February 17, 2017 (Appendix G3 of the 2017 Annual Report). In June 2018, the Environmental Effect Monitoring Study 3 Interpretative Report was submitted to ECCC. A copy of this report is provided in Appendix 2 and will also be part of the 2018 annual report. Agnico Eagle will continue to provide KIA and other regulators copies of reports and data submitted to ECCC via the Annual report.	Section 8.4 of the 2018 Annual Report
KIA	MBK	Amaruq Exploration Access Road	AEM is required to provide "a brief summary of Wildlife Monitoring and Mitigation Plan (WMMP) results including the wildlife log and record of observations as well as any mitigation actions that were undertaken" (App A2 p. 8). AEM provides the raw data of wildlife observations and mitigation actions in appendices but does not summarize this information in the text.	Please provide a written summary of the log and record of observations and mitigation actions in the text (e.g., number of each type of wildlife encountered, actions taken, and outcome of actions).	Agnico Eagle acknowledges KIA's comment and will provide the requested information in the 2018 Wildlife Monitoring Report to be submitted as part of the 2018 Annual Report.	Refer to Section 4, Table 4.1 (list of deterrence activities) and Table 4.2 (wildlife records by species and month) of the 2018 Wildlife Monitoring Report found in Appendix 45 of the 2018 Annual Report
KIA	MBK	Section 4: Water Management Activities - Lake Level Monitoring	AEM monitors lake levels during the open water period for Third Portage Lake, Second Portage Lake and Wally Lake. Third Portage Lake has not received discharge from Portage Attenuation Pond since 2014. Second Portage Lake receives water from the East Dike seepage year-round, while water from the Vault Attenuation Pond was discharged into Wally Lake from July 17, 2016 to October 11, 2017. The General Water Movement models for 2017- 2029 presented in Appendix C2 –Water Management Report and Plan do not include Second Portage Lake.	Please include Second Portage Lake in the General Water Movement models for the life of the mine.	Discharge to Second Portage Lake will be included in the General Water Movement models for the life of mine. This will be integrated into the 2018 annual report	Refer to Water balance Appendix B (General water movement) of the 2018 Water Management and Report found in Appendix 8 of the 2018 Annual Report. Second Portage Lake is part of each flow chart from 2018 to 2021.
KIA	MBK		Table 4.2 presents 2017 raw water level monitoring results. It would be helpful if each lake/pond column also included a calculation of the ice-free average, not just the raw data.	Please include the 2017 average water level and the long-term average value for each lake in Table 4.2.	Agnico acknowledges KIA's comment and will add the requested information in the 2018 Annual Report.	Refer to Table 4.5 in the 2018 Annual Report
KIA	MBK	Section 6: Waste Management Activities - General Waste Disposal Activity	All tables in this section are missing a tally of the total volume or mass of waste generated in 2017.	Please add information on the total volume or mass of waste to each of the tables in this section	Two tables were missing a tally in Section 6 of the 2017 Annual Report. This will be corrected in the 2018 Annual Report.	Section 6 of the 2018 Annual Report
KIA	MBK		The information presented in Table 6.2 is not clear. From the table it appears that waste was deposited to each landfill except #3 in 2017. Why was #3 not used? Why is there a '?' for the volume deposited to landfill #5B? It appears from the table that waste continues to be deposited to landfills even after they are covered—is that correct? In the text AEM indicates that it landfilled 13,345 m3 in 2017, but this does not align with the volumes listed in Table 6.2, which total 49,434 m3.	Please clarify information presented in Table 6.2 and ensure that it agrees with accompanying text.	Agnico Eagle will correct and update Table 6.2 in the 2018 Annual Report.	Section 6 and Table 6.2 of the 2018 Annual Report
KIA	MBK		Table 6.3 summarizes the amount and type of hazardous waste shipped offsite in 2017. No mass is provided for the 60 L of water grease listed in the last row.	Please include a mass for water grease in Table 6.3.	Agnico acknowledges KIA's comment and will make sure to include a mass for all hazardous waste in the 2018 Annual Report.	Section 6 and Table 6.3 of the 2018 Annual Report
KIA	MBK	Section 7: Spill Management	Meadowbank experienced a steady increase in the number of reportable spills between 2013 and 2016, at which time a Spill Reduction Action Plan was implemented. There was a slight decrease in the number of reportable spills from 2016 to 2017 (18% fewer, from 34 in 2016 to 28 in 2017). However, the number of non-reportable spills has shown a steep increase since 2014, including a ~150% increase from 2015 to 2016, and an 18% increase from 2016 to 2017. AEM does not discuss possible reasons for why the number of non-reportable spills continue to rise despite implementation of the Action Plan. We recommend that the number of reportable and non-reportable spills occurring onsite from 2011 to 2017 be presented in table or graph format. In Tables 7.1 and 7.2, AEM reports that "contaminated soil picked up and disposed of appropriately" for numerous spills but it is not clear what clean-up procedure was followed.	Please present the number of reportable and non-reportable spills from 2011 to 2017 in table or graph format.	Agnico acknowledges the KIA's recommendation and will include the information in the 2018 Annual Report, as mentioned in KIA Recommendation 29 above.	Section 7.1 of the 2018 Annual Report
KIA	MBK	Section 8: Monitoring - CREMP	Sediment Chemistry Chromium levels continued to increase in sediment at Third Portage Lake in 2017, exceeding the trigger value and showing a statistically significant departure from the baseline value. AEM conducted a bioavailability study in 2015 which concluded that chromium changes were related to dike construction material and did not threaten the benthic community. However, AEM recommends that a new bioavailability study be conducted in 2018 to determine if ongoing changes are a concern ecologically. AEM also recommends that sediment coring be repeated in 2018 to determine if chromium levels have stabilized or continue to increase. We agree with these recommendations.	We support AEM's plan to repeat sediment coring and to conduct a new bioavailability study at Third Portage Lake in 2018.	Agnico acknowledges KIA'S comment. The result of the 2018 sediment coring will be provided in the 2018 Annual Report.	2018 CREMP Report found in Appendix 31 of the 2018 Annual Report

KIA	MBK	Section 8: Monitoring - CREMP	Wally Lake had trigger exceedances in lead, chromium and arsenic in 2017 sediment samples. While lead and chromium were "marginally above their respective trigger values" (p. 136), arsenic was approximately 2.5 times higher than baseline and had increased since the previous coring sample was collected in 2014. AEM suggests that this trend may be due to natural spatial heterogeneity but is not affecting benthic richness or abundance according to the 2017 BACI analysis. AEM recommends that coring continue in 2018 to determine whether the increasing trend is real or related to spatial heterogeneity, and that a targeted bioavailability study also be conducted to determine potential effects on biotic communities. We agree with these recommendations for further study of the issue. However, we are not clear on how additional coring will resolve whether the arsenic trend is mine-related or due to spatial heterogeneity. How would elevated arsenic levels reflect spatial heterogeneity if they represent an increase from baseline levels collected at the same location? Furthermore, it is not clear whether AEM has established medium and high level triggers that require additional action if levels of these parameters continue to increase. This should be completed in response to triggering a low action level response.	Please explain how additional coring will be used to distinguish between minerelated and background variation in arsenic values at Wally Lake. Please also clarify the potential influence of spatial heterogeneity on variation in arsenic levels.	This region is highly mineralized and metals concentrations in sediment from the Meadowbank project lakes can be quite variable over a small spatial area within the prescribed sampling areas. Coring is undertaken at the same general locations within the sediment basin (8 m +/- 1.5 m) to minimize the potential confounding effects of spatial variability in sediment metals concentrations, but even on the scale of 10-20 m, sediment metals concentrations are not homogenous. This phenomenon is exemplified by the patterns observed for arsenic at reference areas INUG and PDL (see figure below, excerpted from 2017 CREMP Figure 3.2-55). Coring (box and whiskers) conducted in 2009 at INUG first highlighted this challenge. Since then, coring results at INUG have continued to be quite variable, but largely been consistent with the range observed across the annual grab samples (open circles for baseline/reference data; black circles for "after" data). Highly variable arsenic results have also been observed at PDL, but less so for the coring results. While the 2017 coring results at Wally show an apparent increase in arsenic relative to 2014, the overall pattern is more suggestive of natural variability (e.g., to what was observed at INUG and PDL) than of mine-related changes (e.g., chromium at TPE); similar differences were observed between two baseline coring events (2008 and 2012) and the most recent coring results are largely consistent with historical data. An additional year of sediment coring at WAL was proposed to confirm that concentrations of some metals (i.e., As) were trending higher in the after period. Multiple years of data from the "after" period help clarify whether "apparent" increases in metals concentrations are attributable to activities at the mine (e.g., chromium at TPE) or simply an artifact of the natural variability in the sediment metal concentrations (e.g., arsenic at INUG and PDL). The 2018 chemistry results will be plotted in time series with data from previous cycles to help distinguish spatial vs temporal trends in metals concentrations in the basin. Further, Agnico Eagle also decided to conduct the targeted toxicity/bioavailability study at the same time. Results for both will be integrated into the 2018 CREMP.	Reger to 2018 CREMP report in Apeendix 31 of the 2018 Annual Report
KIA	MBK	Section 8: Monitoring – Mill Seepage	AEM implemented a monitoring program for mill seepage in 2014, as part of the Freshet Action Plan. AEM presents the results of water quality monitoring of seepage in the interception trench, monitoring wells and Third Portage Lake in Tables 8.65 and 8.66, as well as regulatory guidelines in Table 8. 64. It would be helpful if exceedances were highlighted in the tables. There are several exceedances relating to free cyanide and iron in trench and wells, and copper in Third Portage Lake. The September 19 copper exceedance in Third Portage Lake (0.013 mg/L vs the CCME guideline of 0.002 mg/L for the protection of aquatic life) should also be discussed in the text.	Please highlight guideline exceedances of parameters in Table 8.65 and 8.66.	Agnico Eagle will highlight guideline exceedances in Table 8.65 and 8.66 in future annual reports.	Table 8.99 and 8.100 of the 2018 Annual Report
KIA	MBK	Section 8: Monitoring – Blast Monitoring	Appendix G7 provides information on blast monitoring, including the fact that no exceedances of DFO guidelines occurred in 2017. It would be helpful to include this detail directly in the Annual Report as well.	Please mention in the Annual Report that no blasting exceeded DFO guidelines in 2017.	Agnico acknowledges the KIA's comment and will mentioned in the annual report if there is or not exceedance to the DFO guideline	Section 8.6 of the 2018 Annual Report
KIA	MBK	Section 8: Monitoring – AEMP - Potential Sources of Impacts and the Conceptual Site Model (CSM)	: AEM states that "although the Cycle 3 EEM Biological Monitoring took place in 2017, results have not yet been reported" (p. 165). When will these be reported?	Please indicate when the Cycle 3 EEM Biological Monitoring results will be available. Please send a copy directly to the KIA.	In June 2018, the Environmental Effects Monitoring Study 3 Interpretative Report was submitted to ECCC. A copy of this report is provided in Appendix 2 and will also be part of the 2018 annual report.	Appendix 33 of the 2018 Annual Report
KIA	MBK	Section 8: Monitoring – Wildlife Monitoring	A habitat analysis was conducted as part of the annual wildlife monitoring program for the first time since 2014 (it is to be carried out at least every three years). The analysis calculated the amount of area and Ecological Land Classification (ELC) units lost to mine development, based on GIS data. The habitat loss for the mine site was predicted to be 867 ha but the actual loss was 1027 ha in 2017, 160 ha or 18% more than predicted. The loss of high suitability habitat was greater than predicted (i.e., beyond thresholds) for ungulates (growing and winter season), small mammals, and other breeding birds at the mine site. The AWAR meanwhile, required considerably less area and habitat loss than predicted (173 ha vs the predicted 281 ha, or 38.5% less than predicted). AEM calculated an overall net loss for the combined mine site and AWAR areas as 4% (46 ha) above what was originally predicted and approved. Appendix G13 – 2017 Wildlife Monitoring Summary Report This appendix provides supplemental information to the wildlife monitoring presented in the body of the Annual Report. Appendix G13 Section 3 Habitat Mapping Table 3.1 of Appendix G13 presents the predicted habitat loss thresholds originally estimated for the mine site and AWAR. No thresholds were reached or exceeded in 2010, 2012, or 2014 habitat analyses. However, the 2014 results indicated that the mine site threshold was being approached, as 775.7 ha actual loss was recorded. AEM responded by committing to remove material stored in the NPAG extension area and use it for capping the North Cell TSF during closure and reclamation. AEM reasoned that this would free up high suitability habitat in the NPAG extension area, making it available again for ungulates following restoration. AEM does not report on how much habitat this would restore, nor when it would be fully restored as high suitability habitat. It is also not clear if this action (i.e., removal of material and restoration of habitat) is underway or has been completed. No mention of this action is made in Section 9.1 Progressive Reclamation of the Annual Report.	Please provide more details on the restoration of the NPAG extension area, including how much habitat would be restored, how it would be restored, and what the status of restoration is.	Agnico will be completing a comprehensive habitat analysis in the 2018 annual report, which will be inclusive of all habitat alterations due to mine activities up to December 2018. The status of the NPGA extension restoration up to December 2018 will be provided and discussed.	Changes in the status of the NPAG extension. Habitat loss was considered fully in the Habiat anaylsis provide in the 2018 Wildlife summary report (Appeendix 45)
KIA	MBK	Section 8: Monitoring – Wildlife Monitoring	Appendix G13 Section 7 All-Weather Access Road and Vault Road Ground Surveys Table 7.4 lists wildlife mortality thresholds associated with AWAR surveys, relating to caribou, predatory mammals, small mammals, raptors, waterbirds, songbirds and other birds. Only the caribou related mortality threshold is stated in Section 7.2 Objectives.	Please include all wildlife mortality thresholds in survey objectives.	All wildlife mortality thresholds will be included in the 2018 annual report.	Refer to Section 3.2 Objectives, Table 3.12 (Road surveys), Section 4.2 Objectives and Table 4.6 (Pits and Mine Site Ground Surveys) of the 2018 Wildlife Report found in Appendix 45 of the 2018 Annual Report
KIA	MBK	Section 8: Monitoring – Wildlife Monitoring	Figure 7.3 shows the number of caribou observed along the AWAR from 2007 to 2017. The lowest number of observations occurred in 2017 (920), compared to highs of 30,000 in 2008, 15,000 in 2010 and ~10,000 in 2007, 2014 and 2015. All other years have recorded observations of at least 2000 caribou along the road. What is the potential reason for the much lower numbers seen in 2017?	Please discuss possible reasons for the low numbers of caribou observed along the AWAR in 2017 compared to other monitoring years. Please investigate whether the decline also occurred in reference areas, or is a mine-related effect.	Preliminary road survey data from January to July 2018 (total of 7 months) indicate that 23,901 caribou were reported, which is well above all other years with the exception of 2008. Caribou populations are known to be cyclical and herds do not always migrate in consistent locations. A discussion on the possible reasons for year to year fluctuations in caribou numbers along the AWAR will be discussed in the 2018 report.	Refer to Section 3.6 and specifically, Figure 3 Number of Caribou Observed along the AWAR (2007 to 2018), Vault (2017 to 2018), and Whale Tail Haul Road (2018) of the 2018 Wildlife Report found in Appendix 45 of the 2018 Annual Report
KIA	MBK	Section 11: Modifications/General/Other – Inspections, Compliance Reports and Non-compliance Issues	AEM is required under Water License 2AM-MEA 1525 to summarize actions taken to address concerns or deficiencies raised in inspection reports and compliance reports. AEM mentions that several inspections occurred in 2017 by ECCC, KIA, INAC, NIRB and the Government of Nunavut. These reports are provided in the appendices but should also be summarized in the Annual Report regarding what issues were raised and how AEM addressed them.	Please summarize concerns or deficiencies raised by agency inspections in 2017 and indicate how they were addressed.	In Agnico's view, it may be easier for the reader to refer directly to the inspection reports to capture the whole interpretation of the report. It is Agnico's opinion that a summary is provided regarding the inspection completed in the year. However, Agnico will continue to improve information reported in this section of the next annual report.	Refer to Section 11.5 of the 2018 Annual Report

KIA	MBK	Section 12: PEAMP – Aquatic Environment	Table 12.2 summarizes the predicted and measured impacts to water quantity in Meadowbank lakes. The freshwater consumption in Third Portage Lake was predicted to be 0.53 Mm3/yr (year 5-8), 2.35 Mm3/yr for 2017 and 9.12 Mm3/yr in 2018 through to expiry of water license and the measured impact was 528,171 m3. It would be helpful to show predicted impact and measured impact in the same unit (i.e., either all asmillion cubic metres or all as cubic metres). For Wally Lake, the predicted usage was 456,450 m3 total average annual discharge but the measured amount in 2017 was 715,606 m3. Why is there such a large discrepancy in these amounts?	Please report predicted and measured impacts in water quantity with consistent units in Table 12.2	Agnico acknowledges KIA's comments and will use the same units.	Table 12.3 of the 2018 Annual Report
KIA	MBK	Section 12: PEAMP – Terrestrial and Wildlife Environment	Table 12.5 presents the differences between predicted and measured habitat loss at the mine. The net percent loss is reported for the mine site and AWAR combined. The individual percent losses should also be reported in the 'Measured Impact' column so that they can easily be compared with the individual values listed in the 'Threshold/Prediction' column (i.e., 18% above for mine site and 38% below for AWAR).	Please include individual percent loss of habitat values for the mine site and AWAR in Table 12.5 under the 'Measured Impact' column.	Agnico acknowledges the comment and will add the percent loss of habitat values for the mine site and AWAR in the next annual report.	Table 12.6 of the 2018 Annual Report
KIA	MBK		Similarly, AEM should show the percent exceedance of threshold/prediction for habitat loss and degradation of high suitability habitat for ungulates, small mammals, waterbirds and other breeding birds (not just area).	Please include the percent exceedance of the threshold/prediction for high suitability habitat under the 'Measured Impact' column for ungulates, small mammals, waterbirds and other breeding birds.	Agnico acknowledges the comment and will add the percent loss of habitat values in the next annual report.	Table 12.6 of the 2018 Annual Report Section 5.6.1 of the 2018 Wildlife Summary Report in Appendix 45 of the 2018 Annual Report
KIA	MBK		Three large predators (one wolverine and two wolves) were killed at the mine in 2017, which exceeded the one mortality per year threshold for large predatory mammals. AEM examined historical trends to evaluate the situation and found that there were no deaths in 2016 and 2015, 1 in 2014, 1 in 2013, 2 in 2012 and 4 in 2011. From this AEM concluded that "based on this data, there is no clear trend towards increasing mortalities of large predatory mammals on the Meadowbank site" (p. 248). However, another way to interpret the data is that there was a steady decline in mortalities on site from 2011 to 2016, followed by an increase again in 2017, which warrants further investigation into what occurred in 2017.	Please discuss possible reasons for an increase in large predatory mammal mortality on site in 2017 and describe what steps are being taken to avoid further threshold exceedances.	Agnico will analyse the 2018 data to see if the increase in 2017 was not just sporadic. Agnico is continuously conducting toolbox meetings and inspections with regards to wildlife attractant and waste management to avoid threshold exceedance.	Agnico analysed the 2018 data to see if the increase in 2017 was not just a sporadic event and determined that mortality numbers were not increasing (refer to Table 4.5 of the 2018 Wildlife Summary Report). Agnico is continuously conducting toolbox meetings and inspections with regards to wildlife attractant and waste management to avoid threshold exceedance. Refer to Table 4.5 of the 2018 Wildlife summary report in Appendix 45 of the 20818 Annual Report.
KIA	MBK		AEM states that "to determine appropriate management actions for exceedances of impact predictions related to habitat disturbance areas, further habitat analyses are planned for 2018" (p. 249).Why are further analyses necessary and what is the goal of these analyses? We recommend that any future studies focus on determining the best options to mitigate the larger than predicted habitat loss on the mine site and steps that can be taken to avoid further exceedances.	Please explain the nature of habitat analyses planned for 2018 and provide a rationale for them. We recommend that these analyses focus on determining the best options to mitigate the larger than predicted habitat loss that has occurred on the mine site to date, as well as steps that can be taken to avoid further habitat loss.	Agnico will be completing a comprehensive habitat analysis for the 2018 annual report, which will include all habitat alterations due to mine activities up to December 2018. The ground analysis could not be conducted for the 2017 annual report because the necessary geospatial data (e.g., actual and approved losses of the Phaser Lake extension) were not available. Section 3.6.1 of the annual report indicates, "The Phaser Lake extension was completed with approval from the NIRB and the Nunavut Water Board (NWB); however, the size of the extension area was not available for habitat calculations in this report." Further, Section 3.8 notes, "To better understand the extent of exceedances, all approved mine components (e.g., Phaser Lake extension) need to be included in the habitat analysis. An updated habitat assessment, with all approved extensions, will be included in the 2018 annual report." Further, details will be provided on adaptive management measures and/or restoration activities undertaken by Agnico up to the end of 2018, in the 2018 annual report.	A complete habitat analysis can be found in Section 5, Wildlife Habitat Monitoring (Appendix 45) of the 2018 annual report. Details on habitat losses relative to permitted areas can be found in Table 5.3 (Meadowbank habitat loss), Table 5.4 (Meadowbank high suitability habitat losses for wildlife VECs), Table 5.5 (Whale Tail Pit and Haul Road habitat loss), and Table 5.6 (Whale Tail Pit and Haul Road high suitability habitat losses for Ungulates)
ECCC	MBK	Appendix G8 – Groundwater; Section 3 Adapted GW Monitoring Program For IPD Appendix A - Meadowbank site visit and groundwater sampling – Factual Report; Section 3.2 and 4.0	ECCC acknowledges that Agnico Eagle Mines Ltd. (AEM or the Proponent) is taking steps to overcome past issues with obtaining groundwater quality samples, and supports the ongoing efforts to resolve issues with groundwater well performance and sample quality. AEM proposes to install three new groundwater wells adjacent to the pits, in order to monitor movement of water from the pits once in-pit tailings disposal commences. In the Groundwater Report, on page 11, the statement is made that: Groundwater samples will be collected from the new wells at least once prior the pit deposition. The groundwater data will represent background geochemistry data prior to in-pit tailings deposition. Section 3.2 of Appendix A states: Alkalinity and TSS are higher in groundwater than in TPL surface water for most samples. Most of the exceeding parameters (copper, total mercury, total ammonia nitrogen and total cyanide) are related to the reclaim water signature (emphasis added). ..Moreover, Stormwater Lake was not sampled and could represent a source of contaminants on site and therefore should be investigated. Section 4 of Appendix A states: Reclaim water is a source of sulfate and can be traced along the groundwater flow paths (from ST-21 to ST-S-5, MW-16-01); ECCC supports the characterization of groundwater prior to the deposition of tailings in the pits; however, ECCC notes that the pre-deposition groundwater chemistry will not be representative of background conditions (as stated) but will provide information on changes to groundwater associated with the in-pit tailings disposal. Any adaptive management strategies for groundwater contamination will be based on thresholds and/or changes to groundwater quality. For example, AEM plans to use pumping to mitigate migration of groundwater of unacceptable quality into the lake, in the event that is observed. Any thresholds should be based on the quality of the groundwater, rather than a degree of change, given that the pre-deposition quality has already been altered.	ECCC recommends that the Proponent ensure thresholds are based on the quality of the groundwater rather than on the degree of change.		This will be evaluated in 2019
ECCC	MBK	2017 Annual Report - Main document; Page 136 - Chromium and Arsenic Increases in Sediments	Sediment coring indicated that trigger values were exceeded at Third Portage Lake for chromium, and at Wally Lake for arsenic. The changes in concentrations appear to be part of an increasing trend, and are statistically significantly higher than baseline levels. For both sites, AEM proposes to repeat the coring program in 2018 and to do a follow-up investigation to the work done in 2015, when a targeted bioavailability study was conducted. The additional coring will verify if the increases are due to a real trend, or to spatial heterogeneity.	ECCC concurs with the re-sampling of sediments in 2018 to identify any trends in increasing sediment metals, and with the evaluation of sediment toxicity, including an assessment of whether the changes are ecologically relevant.	Agnico Eagle acknowledge ECCC comment. Results of the 2018 re-sampling in willl be provide in the 2018 Annual Report	2018 CREMP Annual Report in Appendix 31 of the 2018 Annual Report
ECCC	MBK	Treatment Process Selection - 2017 Water Management Report and Plan; Section 3.2.2	The Plan states that re-flooding of Portage Pit will commence in October 2018 with 300,000 m3 transferred and treated (if required) from the South Cell. It is not clear if a treatment process has been identified for use	ECCC recommends that the Proponent advise the current status of treatment and details of any treatment that will be use.	Currently, the WTP planned at closure prior to pit re-flooding will consist of treating the reclaim water in the South Cell TSF prior to its transfer to the pits. The WTP will be designed to remove TSS and metal using a physico-chemical treatment process. Chemicals will be added such as a coagulant to remove TSS and either lime, caustic soda or sulfide based chemical to precipitate out the metals. A polishing step could be added to further adsorb any remaining dissolved metals in the water. With the start of in-pit deposition, the final treatment chain will ressemble the treatment process initially planned for closure. The final treatment chain is currently under development. Agnico is planning to conduct treatability tests on the reclaim water accumulated in the pit once in-pit deposition begins.	2018 Water Management Report and Plan provided din Appendix 8 of the 2018 Annual Report
ECCC	MBK	Stormwater Management Pond Appendix C – Meadowbank Water Quality Forecasting Update for the 2017 Water Management Plan; Section 3.4.3 Concentrations Used in the Model	The Stormwater Management Pond (SMP) is an internal water management structure, and is not part of the monitoring program as it is not regulated. However, contributions from the SMP are included as a water quality model input for the updated Mass Balance Model of site water quality. The main parameters of concern for the SMP are ammonia and nitrate contributions because of the treated sewage in the pond. The data used is from 2013, and conditions may vary from that time.	ECCC recommends that the Proponent conduct characterization of the Stormwater Management Pond water quality for the next model update.	A sample of the SMP water was taken in 2018. This updated data was integrated in the 2018 water quality forecast model	2018 Water Management Report and Plan provided in Appendix 8 of the 2018 Annual Report

ECCC	MBK	Sulphate Guidelines Appendix C – Meadowbank Water Quality Forecasting Update for the 2017 Water Management Plan; Section 4.2.4 v.	The report correctly states that there are no Canadian Council of the Ministers of the Environment (CCME) guidelines for sulphate, however the British Columbia Ministry of Environment (BC MOE) guidelines for sulphate have been updated in 2013 and would be appropriate for use. The guidelines are available at: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines/approved-water-quality-guidelines And the Technical Appendix is available at: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/wqgs-wqos/approved-wqgs/bc_moe_wqg_sulphate.pdf	ECCC recommends use of the BC MOE sulphate guidelines for comparisons to predictions.	The guidelines for sulphate was taken into considering in the 2018 water quality forecast model.	2018 Water Management Report and Plan provided din Appendix 8 of the 2018 Annual Report
ECCC	MBK	Errata - 2017 Annual Report – Main document	Under Section 5.1 Geochemical Monitoring, document page 38, the reader is referred to Table 8.29. This should be Table 8.28 for the June data, or Table 8.49 for the data plus Quality Assurance/Quality Control.	ECCC recommends that the Proponent update the reference to the correct Table number.	Agnico Eagle ackownledge ECCC's comment and have bring a particular attention to well reference Table in the 2018 Annual Report	All Section of the 2018 Annual Report
	MBK		Table 8.12: 2017 Tailings Reclaim Pond Water Quality Monitoring (ST-21) has values for cyanide (CN) measurements. For the sample taken March 6, 2017 the Total CN is 2.960 mg/L and Free CN is 6.060 mg/L. Total CN would include Free CN, so it is confusing that the higher number would be Free CN.	ECCC recommends that the Proponent clarify the higher value for Free CN which should be part of the Total CN.	Agnico Eagle have validated the value found in the analysis certificate and the good data were reported. A sample contamination can explain the higher CN free than CN Total.	NA
ECCC	MBK	1.7 Acid Rock Drainage Appendix D1 - Mine Waste Rock and Tailings Management Plan	Although Acid Rock Drainage (ARD) and Acid Mine Drainage (AMD) are synonymous, these two terms are used interchangeably in different parts of the report.	ECCC recommends that the Proponent use ARD or AMD throughout the report, for consistency purposes.	Agnico Eagle ackownledge ECCC's comment and have bring a particular attention to use only one term.	All Section of the 2018 Annual Report
	MBK	Acid Rock Drainage - Appendix D1 - Mine Waste Rock and Tailings Management Plan; Section 1 and Section 2.1.4	The Proponent states that "Tailings are potentially acid generating (PAG); therefore a minimum 2m thick cover of non-potentially acid generating (NAG) rock-fill will be placed over the tailings to physically isolate the tailings and to confine the active layer within relatively inert materials." It is unclear why only 2 m is being used to cap the tailings when in Section 2.1.4 Permafrost, the Proponent stated that "the depth of the active layer ranges based on depth of overburden, vegetation and organics, proximity to lakes, and aspect is about 1 to 1.5 m." This determination, as stated by the Proponent, was based on the depth of overburden, vegetation and organics, and proximity to lakes. When the depth of tailings is greater than the depths of overburden as it is bound to be, it seems likely that the active layer in the tailings could be greater than 1.5 m and as such using a 2 m capping for the tailings may not completely contain the active layer or prevent seepage that may occur through the active layer. It is also worth noting that a 4 m cover is planned for the Portage waste rock storage facility of NAG rock placed over PAG waste rock piles.	ECCC recommends that the Proponent further consider cover depth over the tailings and explain why it is different from what was used for the PAG rocks in the Portage waste rock storage facility.	The detailed engineering study performed by O'Kane for the TSF cover demonstrate that the tailings will remains frozen with a cover of 2m. The TSF cover will be made of waste rock and this configuration cannot be directly compared to the active layer present in overburden near lake. It should also be noted that the depth of an active layer is not a function of the total thickness of material but a function of the characteristic of the material. The capping thickness of the TSF cannot be directly compared to the one of the RSF as the thermal phenomena that both cover will experience are not the same. The convective airflow model produce by O'Kane for the TSF assume that the tailings are fine enough such that air conductivity within the tailing itself is sufficiently low and the water content will be sufficiently high. The air at the bottom of the cover system (tailing interface) will therefore have a higher density than the air in the top of the cover. This results in a stable system in which little to no advective airflows occurs and the coldest air always resides on the tailings surface. This phenomenon will not be present in the RSF.	NA
ECCC	MBK	Faults (Tailings Storage Facility)- Appendix D1 - Mine Waste Rock and Tailings Management Plan; Section 2.1.3	The Proponent states that "As indicated on Figure 2-5, two main faults are inferred in the Portage deposit area. The Second Portage fault trends to the northwest and is expected underneath the Central Dike and TSF, roughly parallel to the orientation of the Second Portage Lake. Analysis conducted during the design of the Central Dike showed little seepage potential". ECCC noted that the Proponent only discussed the second fault trending northwest, however, no discussion was made of the other inferred fault (first fault) that trends almost north-south and passes underneath Portage pit, Goose pit, and terminates at the edge of Portage Rock Storage Facility, or what influence the presence of that fault has on the seepage in and out of the pit, the rock storage facility and central dike, or on water management in general.	ECCC requests that the Proponent clarify why this first major fault and its influence on seepage and water management was not discussed in the report.	The fault the ECCC is referencing is the Bay-Goose Fault. Contrary to the Second Portage fault this fault does not cross Central Dike and as a results it is not expected to contribute to the Central Dike seepage. The only water contribution that this fault is making to the infiltration through Goose pit. As the Portage RSF foundation is frozen seepage through the foundation is not expected	NA
ECCC	MBK	Waste Rock- Appendix D1 - Mine Waste Rock and Tailings Management Plan; Section 6	The Proponent states that "To date, approximately 80% of the Portage RSF has been covered. The final top capping will be completed at closure. The depth of cover was selected based on thermistor data and thermal modelling which indicates the depth of thaw (active layer depth) to be on the order of 1.5 m. The cover material would be coarse to allow the development of convective cooling during winter, and insulation through trapped air within voids during summer". ECCC notes that the same pathways that are conducive to convective cooling during winter could become pathways for infiltration of water and air during the summer providing an environment conducive for oxidation. The purpose of a cover is to limit the amount of air and water that interacts with the material underneath	ECCC requests that the Proponent clarify whether the "coarse" material would be sufficiently compacted for the purpose of limiting the amount of air and water that interacts with the waste rock underneath.	The reference to "coarse" implies rockfill and not granular crushed material, and will be composed of the same material characteristics that were used for the capping of the RSF and TSF that are deemed adequate for closure purposes. Wording will be changed to reflect this in the 2018 annual report. The RSF NAG cover will not be compacted, but this is taken into account in the thermal model. The capping material will have a sufficient thickness to ensure the PAG waste rock remain in frozen condition and has limited interaction with water.	NA
ECCC	MBK	Tailings Reclamation- Appendix D1 - Mine Waste Rock and Tailings Management Plan; Section 7.3	Proponent states that "The final design for the engineered cover system is a layer of compacted NAG waste rock (soapstone) with a minimum thickness of 2.0 m." Throughout the Annual Report, soapstone has not been mentioned or encountered until now. It is not clear whether soapstone is part of the waste rock sourced from mining operation or introduced from another source. In addition, soapstone (Steatite) is a metamorphic rock composed dominantly of varying amounts of talc. Part of its physical properties is that it is relatively soft because of its high talc content, and in some cases often used as an insulator. Therefore using soapstone as a tailing cover material may create an insulation effect; it could be impervious and thereby trap any heat generated by sulphide "hot spots" within the tailings beneath the cover. This heat may then effectively neutralize the effectiveness of permafrost. If the soapstone (Steatite) used as cover material has a very high content of talc, when exposed to weathering conditions, it may breakdown, become friable and create other unwanted conditions such as the formation of pathways which allow air and water to enter and interact with the waste rock underneath	ECCC recommends that the Proponent clarify where the soapstone is being sourced from and the effect of introducing and using a soapstone as a cover.	The term soapstone refer to the ultramafic unit. Soapstone is not the official term for this unit and should not have been used. The ultramafic rock is the predominant NAG lithology present in the Portage Pit deposit and will be used as capping material of the TSF and Portage RSF. Visual observation from this material show that it is heterogeneous with coarser and finer zone, so it is possible that some part of the capping is more insulative than other. However, as the capping will be done in winter condition over frozen tailings, using such a material will have advantage as it will allow to better preserve the freezing condition of the tailings while limiting water infiltration in the cover.	NA

DFO	MBK	Appendix G5: 2017 Habitat Compensation Monitoring Report	DFO-FPP notes that in the Appendix G5: 2017 Habitat Compensation Monitoring Report, Agnico indicated that "Fishing stations were only recorded for Second Portage Lake in 2017, and angling durations were not recorded for each station, so the full assessment of differences between reference sites and dikes sites could not be carried out" (p. 29).	In the future, DFO-FPP requests that Agnico ensure all data collected are documented/recorded properly, and include information such as station identification and fishing duration, to allow data comparison between dike and reference stations.	Agnico Eagle ackownledge DFO's comment and will ensure data are correctly collected for the next Habitat Compensation Monitoring.	NA
DFO	MBK	Appendix G7: 2017 Blast Monitoring Report for the Protection of Nearby Fish Habitat, under section 3, on page 5	In the Meadowbank Gold Project 2017 Annual Report, Appendix G7: 2017 Blast Monitoring Report for the Protection of Nearby Fish Habitat, under section 3, on page 5 "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." DFO cannot confirm the validity of this conclusion at this time, without further information and clarity on the frequency of proposed blasting moving forward. As such, DFO-FPP recommends that Agnico continue to record Peak particle velocity (PPV) and overpressure monitoring data during blasting activities.	DFO-FPP recommends that Agnico continue to record Peak particle velocity (PPV) and overpressure monitoring data during blasting activities.	Agnico Eagle acknowledge DFO comment and will continue to record Peak particle velocity (PPV) and overpressure monitoring data during blasting activities.	NA
DFO	MBK	page 240 in Table 12.4. Predicted and measured impacts to fish and fish habitat, from the Meadowbank Gold Project 2017 Annual Report, under "Mortality of fish and fish eggs	Worker Fishing: DFO-FPP notes that on page 240 in Table 12.4. Predicted and measured impacts to fish and fish habitat, from the Meadowbank Gold Project 2017 Annual Report, under "Mortality of fish and fish eggs", Agnico has stated that monitoring conducted for Worker fishing in 2017 was "None" and Observed Impacts for 2017 were "Not assessed". DFO-FPP notes that Term and Condition 52 of the NIRB's project certificate No.:004 states: "Cumberland shall enforce a no-fishing policy for employees while working on the job site." In addition, Condition 2.6 under Agnico's Fisheries Act Authorization NU-03-0191.3 states "The Proponent shall develop and enforce a policy that prohibits fishing on Second Portage Lake and Third Portage Lake and surrounding lakes and streams by individuals on the mine site in a capacity as mine employee, contractor or visitor during all phases of mining activities, unless otherwise agreed to by DFO." DFO-FPP notes that it is important to monitor worker fishing in order to demonstrate compliance with both the NIRB term and condition and AEM's Fisheries Act Authorization.		Agnico Eagle have a no-fishing policy for his Meadowbank Mine Site. There is no observed impact in 2017 as there was no worker fishing. Agnico should have write that there is 'no observed impact' instead of 'not assesses' to avoid confusion.	Table 12.5 of the 2018 Annual Report
CIRNAC	MBK	Central Dike	Seepage issues have been reported from the Central Dike in 2014, 2015, 2016, and 2017, with 332,177 m3 pumped from the downstream area to Goose Pit. Seepage rates have not declined to the extent predicted. The Meadowbank Dikes Review Board recommended decreasing the water level in the Tailings Storage Facility (TSF) until tailings deposition have a blanketing effect. Geotechnical investigation revealed a void space at the interface of the embankment fill and the foundation. Reference was made to an Action Plan of mitigative measures, however the plan was not provided in the Appendix to the Annual Report. Piezometer readings were taken, but the values were not provided nor referenced in the text of the annual report.	CIRNAC recommends the proponent investigate further and provide explanation as to why seepage rates have not declined to the extent predicted. The proponent should confirm if the water level in the TSF was decreased in 2017, and if the desired blanketing effect was achieved with the tailings deposition. CIRNAC recommends that the Action Plan contain mitigative measures to address the void space revealed by the geotechnical investigation at the interface of the embankment fill and the foundation, as well as how to decrease the seepage rates. CIRNAC also recommends the piezometer reading data be provided for review.	The seepage rate has declined following the trend predicted by the seepage model (starting in the summer of 2017) and has decreased significantly since the annual report was produced. Tailings deposition contributed directly to this decrease by providing the aforementioned blanketing effect. Further field investigation were not able to confirm the presence of a void into the foundation. It is Agnico and the designer opinion that if a void is present it is a very localised phenomena with no significant impact on the dike integrity.	NA
CIRNAC	MBK	Stormwater Dike	Tension cracks were noted on the Stormwater Dike in August 2016 and August 2017. Originally frozen foundational soft sediments are now thawed.	CIRNAC recommends AEM demonstrate that the thawed foundation sediment is not a potential tailings water contaminant pathway in the 2018 Annual Report.	The thermistor installed at the toe of the dike indicate that not all the foundation has thawed due to the presence of water. The top part of the soft sediment thawed causing cracks in the crest of the structure while the deeper portion is still frozen. As SWD is an internal structure the risk for seepage of water out of the TSF is quite low. The potential for seepage through groundwater is monitored through the groundwater well data taken around site. A discussion on this aspect will be added in the 2018 Annual Report	Section 3.1.1.1 c - Stormwater dike of the 2018 Annual Report
CIRNAC	MBK	Quarry 22	Remedial activities continue at Quarry 22 from a hydrocarbon spill. Contaminated material was removed in 2016. Scouring of the Quarry 22 land surface is taking place to address residual hydrocarbon impacts. Appendix B4 Quarry 22 Report provided no chart or data on the remedial activity progress.	CIRNAC recommends a delineation map be provided of all the sample point locations - highlighting the locations which still have exceedances compared to the locations that are below guidelines. Each sample location should be listed in a table or chart showing measured hydrocarbon level trends over time to evaluate if the chosen remediation strategy is working in the 2018 Annual Report in an effort to remediate the site quickly and avoid permanent environmental damage.	Agnico Eagle added to the 2018 Q22 Report the historical data from 2014 - 2018 and grah to assess the trending. Agnico is confident that the natural degradation of Petroleum Hydro Carbon (PHC) related products is an effective remediation method for the Q22.	2018 Q22 Report in Appendix 12 of the 2018 Annual Report
CIRNAC	MBK	Vault Discharge Water quality	AEM stated that "water from the Vault Attenuation Pond (contact water) was discharged from July 17, 2016 to October 11, 2017. This water was discharged into Wally Lake through the diffuser as effluent. No treatment of the water was required to date prior to discharge as the total suspended solids (TSS) were below the required limit. The Vault discharge is also subject to the MMER and all monitoring results met the appropriate criteria." However, CIRNAC notes that no monitoring results were presented to support this claim.	CIRNAC recommends that AEM substantiate its claims that no treatment was required with data or evidence in the 2018 Annual Report.	There is no discharge from the Vault Attenuation Pond into Wally lake in 2018. For 2017, results were presented in Table 8.2	NA
CIRNAC	MBK	Turn Lake Level Monitoring	Water diversions associated with Phaser Lake dewatering could impact Turn Lake water level. However, CIRNAC notes that no monitoring results were presented in the 2017 Annual Report.	CIRNAC recommends that AEM present monitoring results on Turn Lake water level or explain the lack of monitoring data on Turn Lake water level in the 2018 Annual Report.	Agnico acknowledges an oversight was made in the level monitoring work plan; thus Turn Lake was involuntarily not included in the level measurements program. Agnico will ensure, moving forward, that Turn Lake water level monitoring in the next open water season will be completed, reported and compared to predictions.	Section 4.2 of the 2018 Annual Report
CIRNAC	MBK	Vault Attenuation Pond Level Monitoring Results	Table 4.2 presents lake level monitoring results. However, it is not clear how the results for Ponds B, C and D in the Vault Attenuation Pond were obtained as CIRNAC notes that there is only one monitoring station for the Vault Attenuation Pond (i.e., station VNIN in Figure 3).	CIRNAC recommends that AEM clarify how lake level results were obtained for Ponds B, C, and D of the Vault Attenuation Pond in the 2018 Annual Report.	All the pond elevations provided are taken by Agnico surveyors using a surveying GPS. A map with labelled pond will be added to the 2018 annual report	Figure 3 of the 2018 Annual Report
CIRNAC	MBK	Pit Water Quality Monitoring	The predicted and measured pit water quality results were compared against each other for the period 2012-2017 and summarized in the annual report. However, it is not clear how the pit water quality has varied with time.	CIRNAC recommends that AEM provide a summary of any observed temporal trends in water quality monitoring results in the 2018 Annual Report.	Plots comparing the predicted water quantity and quality over time were incorporated into the 2018 Annual Report. The predicted values were be plotted a a line graph and compared to the actual data will be presented as a bar graphs.	Section 4.4.3 and Figure 9 - 12 of the 2018 Annual Report

CIRNAC	MBK	Results of Thermistor Measurements for Tailings and Waste Rock Storage Facilities	The results of thermistor measurements were presented in the annual report without any discussion of these results and how they are integrated in the update of the Waste Rock and Tailings Management Plans. There is also no discussion on how the results compare with early thermal modelling predictions.	CIRNAC recommends that AEM analyze the thermistor monitoring results against early thermal modelling predictions and update its Waste Rock and Tailings Management Plans if large discrepancies are observed between the monitoring results and model predictions in the 2018 Annual Report.	Agnico Eagle acknowledge CIRNAC comment and give the mandate in 2018 to a consultant. Result will be provided in the 2019 Annual Report	Results to be provide in the 2019 Annual Report
CIRNAC	MBK	Thermal Monitoring at Vault Waste Rock Storage Area	Section 9 of the Waste Rock and Tailings Management Plan stated that "no instruments are planned for the Vault Waste Rock Storage (VWRSF) area". It is not clear how AEM will confirm that the VWRSF will be frozen without instrumentation.	CIRNAC recommends that instrumentation be added to the VWRSF to confirm its freezeback predictions and to measure performance.	Instrumentation is planned during closure.	NA
CIRNAC	MBK	Seepage Through Central Dike	CIRNAC notes that on the Central Dike seepage issue, the Meadowbank Dike Review Board (MDRB) expressed concerns and recommended that AEM consult with Ground Penetrating Radar (GPR) specialists to assess applicability of GPR surveys.	CIRNAC recommends that MDRB's recommendation be implemented.	The MDRB recommendation was followed. GPR was found to not be suitable technology for this application and a drilling campaign was done. The presence of a void was not confirmed. The MDRB was satisfied with how Agnico handled that recommendation.	NA
CIRNAC	MBK	Sources of Groundwater	The sources of groundwater were identified as "reclaim water, waste rock PAG stockpiles, or natural surface" water based on a geochemical signature (i.e., sulfate concentration vs calcium + magnesium concentrations). However, CIRNAC notes that among the three types (or sources) of groundwater, one type was marked as waste rock PAG stockpiles in the text, but as NAG stockpile in the corresponding figure (i.e., Figure 38).	CIRNAC recommends that AEM clarify how groundwater from either waste rock PAG stockpiles or NAG stockpiles are identified and differentiated.	It was suggested within Figure 38 of the 2017 Annual Report that three (3) possible signatures were identified in 2017 groundwater related samples. They were showed and separated according to chemical ratios and possible source identified, for example NAG stockpiles are located in the vicinity of the locations (BG Lagoon and Pit E West) identified under NAG stockpile signature. A hypothesis was formulated that this water enters in contact with the rocks and dust and can eventually leach with a signature from either (NAG or PAG). This rationale was meant to explain why sulfate vs calcium + magnesium was plotting a little higher on the graph when compared with background groundwater samples. This hypothesis has not been confirmed as other factors could influence those variations. The proximity of the signature comparison the natural water meant that focus could be shifted to other elements. Thus it was mentioned in the text on page 161 that three potential groups could be further interpreted on site: • Samples containing reclaim signature • Samples containing a potential signature from waste rock PAG stockpiles (further investigation would be required), and • The natural surface water and groundwater signature.	NA
CIRNAC	MBK	Aquatic Effects Monitoring Program (AEMP)	A text summary of the Aquatic Effects Monitoring Program (AEMP) was provided in the 2017 Annual Report with reference to the full reports in the appendix.	CIRNAC would appreciate if visuals such as sampling location maps and trend charts were included in future Annual Report summaries.	The AEMP serve as an overarching "umbrella" program that conceptually provides an opportunity to integrate results of individual, but related, monitoring programs in accordance with NWB Type A Water License 2AM-MEA1526 requirements. This section is the integration of all monitoirng program and summaries majors finding. To easy the reading, Agnico will continue o refer to the report appended to the 2018 Annual Report.	NA
CIRNAC	MBK	Monitoring and Management Plans	Eight monitoring and management plans were revised in 2017.	CIRNAC seeks clarification on which of the eight monitoring and management plans revised in 2017 were approved by the Nunavut Water Board (NWB).	As per the Water License 2AM-MEA1526 Part B, Item 13 and Item 14, the Board has approved (or accepted) the plan listed in those item. Any changes to the plans deemed significant shall be considered as an amendment to the plan(s) or as a modification and must be approved by the Board. As per Water License 2AM-MEA1526 Part B, Item 16 : 'The Licensee shall review the Plans or Manuals referred to in this Licence as required by changes in operation and/or technology and modify the Plans or Manuals accordingly. Revisions to the Plans or Manuals are to be submitted in the form of an Addendum to be included with the Annual Report required by Part B, Item 2, complete with a revisions list detailing where significant content changes are made.' Plans resubmitted as part of the Annual Report of the 2017 or previous reports are consiedred as minors changes in operations and were submitted as part of the Annual Report as required by Part B Item 16, and thu considered as approved. It's the process emploed by Agnico Eagle since the approval of the Water License. During Modification or Amendement of the Water License, plans were resubmitted for Approval by the Board.	NA

CIRNAC	MBK	Effluent Quality at East Dike and Vault Road Crossing	Reference: • Meadowbank Gold Project 2017 Annual Report, Agnico Eagle Mines Limited – • Meadowbank Division, March 2017, Section 8.2.3 • Meadowbank Gold Project 2017 Annual Report, Agnico Eagle Mines Limited – • Meadowbank Division, March 2017, Appendix C2 Water Management Plan, Sub- • Appendix D 2017 Freshet Action Plan • Water Licence Inspection Form, Follow-Up Report, Agnico Eagle Mines Ltd., • Written by Water Resource Officer Christine Wilson, October 25 – 27, 2017 Concern: On the October 2017 Inspection Form, a CIRNAC Water Resource Officer (WRO) notes three events of elevated total suspended solids (TSS) were recorded; two were at the east Dike and one was at the Vault Road Crossing. It was outlined in the above referenced documents that sedimentation during freshet was a likely cause of the elevated TSS values. The WRO directed Agnico Eagle Mines Ltd. (AEM) to provide a compliance plan to represent AEM's due diligence and to provide an improved mitigation strategy to prevent further discharge of poor quality effluent. A reference to the compliance plan was not provided in the 2017 Annual Report, and could not be located by CIRNAC. The WRO also noted that the Freshet Action Plan was insufficient to prevent further spills. In Section 8.2.3 of the 2017 Annual Report, CIRNAC notes that AEM has made efforts to mitigate spills; spill prevention training has been provided to employees, maintenance has been performed on equipment, and that Key Performance Indicators (KPI) were developed to monitor the reported spills. In addition, the Freshet Monitoring Plan has been updated.	CIRNAC recommends a reference to the compliance plan be provided in the 2018 Annual Report. The proponent should monitor/observe the effectiveness of the compliance plan in the 2018 Annual Report, and make necessary updates to the plan if necessary.	The Water Quality and Flow Monitoring Plan detailed in Section 3.2 - Event Monitoring, addresses the site specific monitoring that is required following any accidental release, like a elevated TSS event. The plan detailled in Section 3.2 combined to the Freshet Action Plan, wich is updated annually, and to the Spill Contingency Plan, Agnico is confident the all necessary measure are in place to well mitigate the risk and monitor an event monitoring.	NA
CIRNAC	MBK	Improvements to the Landfarm	Reference: • Meadowbank Gold Project 2017 Annual Report, Agnico Eagle Mines Limited – Meadowbank Division, March 2017, Section 8.3.3.17 • Water Licence Inspection Form, Follow-Up Report, Agnico Eagle Mines Ltd., Written by Water Resource Officer Christine Wilson, October 25 – 27, 2017 Concern: CIRNAC recognizes that the original landfarm facility (Landfarm 1) was closed and moved to a new location (Landfarm 2) in 2016, and that no contaminated soil was added until 2017. In section 8.3.3.17 of the 2017 Annual Report, CIRNAC reads that some water runoff was identified at the landfarm in June 2017, but there was not enough water to sample. On the October 2017 Inspection Form, a Water Resource Officer (WRO) reported that improvements continue to be made at the landfarm, however the WRO expressed concern that Landfarm 2 does not capture runoff from the facility.	CIRNAC recommends that AEM provide the civil design report and as built drawings for Landfarm 2, along with the Landfarm Management Plan to clarify water management facilities and procedures at Landfarm 2.	As-built for Landfarm 2 were provied to NWB on November 18, 2016 and submitted as part of the 2016 Annual Report. Agnico will refer you the Appendix XX of the 2018 Annual Report and the Landfarm Management Plan in Appendix XX.	Appendix 28 of the 2018 Annual Report and the the Landfarm Management Plan in Appendix 51.
CIRNAC	MBK	Management Plans: Embedded Links	Reference: • Meadowbank Gold Project 2017 Annual Report, Agnico Eagle Mines Limited – Meadowbank Division, March 2017, Appendix I1 – Management Plans Concern: Management Plans were provided in Appendix I1 of the 2017 Annual Review as a link to an online document. This link has either been removed or broken. CIRNAC was therefore unable to read and review these management plans, specifically the Spill Contingency plan and the Crisis Management Plan.	CIRNAC recommends providing the management plans in a different format to ensure CIRNAC receives them	Management Plan provide in annual report was not supposed to report to an online document, it's either a PDF document containing all the management plans. Agnico always provide CIRNAC with an electronical copy of the complete annual report to ensure they received all the documents. Agnico will invite CIRNAC to communicate directly with us when there is any problems relate to any documents.	NA
CIRNAC	MBK	Runoff at East Side of Portage Waste Rock Storage Facility	Reference: • Meadowbank Gold Project 2017 Annual Report, Agnico Eagle Mines Limited – Meadowbank Division, March 2017, Section 8.3.3 • Meadowbank Gold Project 2017 Annual Report, Agnico Eagle Mines Limited – Meadowbank Division, March 2017, Appendix C2 Water Management Report and Plan • Water Licence Inspection Form, Follow-Up Report, Agnico Eagle Mines Ltd., Written by Water Resource Officer Christine Wilson, October 25 – 27, 2017 Concern: On the October 2017 Inspection Form, a CIRNAC Water Resource Officer (WRO) expressed concern that runoff from the facility may not be adequately collected, and that elevated levels of TSS at Vault Road crossing may be affected by this runoff. CIRNAC reads in the 2017 Annual Report (section 8.3.3) that a mine site water collection system has been developed to control surface water. CIRNAC reads in the Water Management Report and Plan that the water which is collected, is managed. However, CIRNAC finds no mention of addressing the WRO's concern about contact water collection.	CIRNAC requests confirmation that all of the surface runoff from the Portage Waste Rock Storage Facility is now being collected, and if necessary treated, by the mine site water collection system in the 2018 Annual Report.	Agnico will refer to section 8.5.3.1.7 for a complete discussion regarting the Portage Waste Rock Storage Facility. All seepage water are entirely contained into the ST-16 sump. Water quality monitoring result from NP2 and donwstream lake confirm that those receiving environment are no longer impated by seepage.	Section 8.5.3.1.7 of the 2018 Annual Report
NWB	MBK	2AM-MEA1525 Part B, Items 13 and 16.	NWB notes that parties identified that there was insufficient discussion about the status of Management Plans as Approved, Updated, etc.	Provide a table listing all Management Plans pertinent to the Water Licence. In the table provide: - the title of the plan; - the date of the most current update to the plan; - classification of the plan as either one that is accepted by the Board or one that has written Approval from the Board; and - the date of the most recent written Approval from the Board for the plan (only for the Approved Plans).	Refer to Appendix 51 for a complete list of Management Plan associated with the Water License 2AM-MEA1526 and 2AM-WTP1826 required under these licenses	Refer to Table 10.1 and Section 10.2 of the 2018 Annual Report

NWB	MBK	2AM-MEA1525 Part B, Items 13 and 16.	NWB notes that parties identified that there was insufficient discussion of about the updates to the Management Plans.	Provide a table listing all updated Management Plans submitted with this year's Annual Report. In the table, provide: - the title of the plan; - the rationale for the update, - a brief description of the update including sections that undergone noteworthy changes, and - for plans that are Approved, classification of the update as either one that is not Significant or one that is Significant. Significant updates require written Approval from the Board prior to plan implementation. Upon review of the plan, the Board will make their own determination of Significance independent of the suggestion from the Licensee.	A list of Management Plans submitted as part of the 2018 Annual Report is provided in Section XX of the 2018 Annual Report. All Management Plans submitted already include a table 'Document Control' which details the change made to the plan during the update. In 2018, no Management Plan were submitted as significant update and were updated as a comprehensive update or following NWB request.	Refer to Table 10.1 and Section 10.2 of the 2018 Annual Report
NWB	MBK	2AM-MEA1525 Schedule B, Item 23	NWB notes that parties identified that there was insufficient discussion of CIRNAC Water Resource Officer Inspections, issues identified and related directions/follow-up actions.	Discuss all CIRNAC Inspections, issues, and follow-up actions from the year of the Annual Report and any that carry forward from previous years. Include in the discussions an assessment of the effectiveness of any actions or compliance plans and updates as relevant.	Agnico have include in the 2018 Annual Report Section 11.5.1.2 a discussion related to CIRNAC inspection in 2018. Agnico will therefore continu to refer to the complete inspection report as supporting document to capture all the informations.	Section 11.5.1.2 of the 2018 Annual Report
ECCC	WT	Water Quality and Flow Monitoring Plan - ECCC comments on the plan before approval - nov 23, 2018	Agnico Eagle's Response to Recommendation: This revision of the Water Quality and Flow Monitoring Plan was completed to align with recently issued Water Licence 2AM-WTP1826 requirements. Field pH and field temperature are not part of Water Licence 2AM-WTP1826 requirements. ECCC Response: Environmental pH and temperature cannot be stabilized in a water quality sample, therefore monitoring the field conditions is necessary to obtain accurate data for these parameters. Accurate pH measurements are important to the overall monitoring program. As pH determines the solubility and biological availability of various water quality parameters (e.g., nutrients and heavy metals), pH data is required in determining the form and toxicity of such parameters. Accurate temperature measurements are necessary for determinations of parameters such as pH, electrical conductivity, and dissolved oxygen, and for the determination of chemical reaction rates and equilibria as well as biological activity.	ECCC recommends as best practice the inclusion of field pH and field temperature in the monitoring program. Inclusion of these parameters is necessary to support the interpretation of monitoring data for various water quality parameters.	Agnico Eagle agrees with this recommendation and will include field pH and field temperature in the next revision of this management plan.	Updated Water Quality and Flow Monitoring Plan provided in Appendix 51 of the 2018 Annual Report
ECCC	WT	Water Quality and Flow Monitoring Plan - ECCC comments on the plan before approval - nov 23, 2018	Agnico Eagle's Response to Recommendation: The TSS-turbidity relationship was developed using paired data collected across a range of TSS sources and concentrations. Agnico Eagle is confident that the TSS-turbidity relationship developed will be adequate. ECCC Response: Due to the site-specific nature of the relationship between Total Suspended Solids (TSS) and turbidity, it is standard practice to use site-specific data to establish the TSS-turbidity relationship. In lieu of establishing a Whale Tail specific TSS-turbidity relationship, it appears that the Meadowbank relationship will be applied directly to the Whale Tail Project.	ECCC recommends conducting periodic validation of the TSS-turbidity relationship through lab analysis of TSS and turbidity values in order to assess/monitor the validity of the approach proposed by Agnico Eagle.	Agnico Eagle acknowledges ECCC's response and will validate the TSS-turbidity relationship developed for Meadowbank. The revised relationship for Whale Tail will be provided in the next revision of the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering.	NA
NWB	WT	Agnico Eagle Mines – Meadowbank Division Responses to Whale Tail WRSF, NPAG and Overburden Stockpile Design Report Comments Comment 3 Reference: Section 4.6.1 & 4.6.2	CIRNAC COMMENT: AEM's design report states "an adaptive monitoring strategy will be implemented in which the decision to install additional thermistor in operation will be based on the analysis of the results of the thermal monitoring program.	CIRNAC requests further details on what temperature, depths and timing would trigger the decision to install additional thermistors and/or signal the WRSF design is not performing as intended.	Agnico intends to evaluate WRSF freeze-back performance by monitoring thermistor strings, and collecting water quality data which will be compared against sensitivity and 'base case' freeze-back modelling, and site-wide load balance modelling. The results of the performance and monitoring will presented within the Annual Report. It is expected that a range of freeze-back performance will occur due to inherent variability in construction technique, physical material properties and chemical material properties. Significant divergence of in situ measurements outside of the range of expected and acceptable variability from the numerical model will be evaluated to determine potential impact on closure and additional monitoring and/or mitigations required. Specifically, should daily temperature readings of thermistors located at the interface of the waste rock and thermal cover system indicate that the waste rock is not frozen, resulting in water quality exceedances beyond permitted values in the WRSF collection ponds or groundwater monitoring prior to post-closure, these will trigger the installation of additional monitoring and/or mitigation to reduce uncertainty in variability and reducing the overall risk to water quality. This overall performance will be based on the integration of the various monitoring data used as model inputs.	Mandate given to consultant in 2018. Result will be provided in the 2019 Annual Report
NWB	WT	Approval letter - Updated Water Quality and Flow Monitoring Plan, Water Management Plan and Waste Rock Management Plan; Type "A" Water Licence No. 2AM-WTP1826, Whale Tail Pit Project; Agnico Eagle Mines Limited. - Jan 21, 2019	Within its correspondence of December 12, 2018, the NWB highlighted that due to this modification, relevant management plans, including the Water Quality and Flow Monitoring Plan, should be updated to reflect updated Monitoring Program. It should therefore be noted that while the Board finds the updated Water Quality and Flow Monitoring Plan generally acceptable and has approved the Water Quality and Flow Monitoring Plan Version 5, October 2018 through the Board Motion No. 2018-A1-025, dated January 21, 2019, as required by Part B, Item 14 of Licence, an updated document for Board review is expected within the 2018 Annual Report submission.	Updated document for Board review is expected within the 2018 Annual Report submission.		Updated Water Qaulity and Flow Monitoring Plan provided in Appendix 51 of the 2018 Annual Report

NWB	WT	Approval letter - Updated Water Quality and Flow Monitoring Plan, Water Management Plan and Waste Rock Management Plan; Type "A" Water Licence No. 2AM-WTP1826, Whale Tail Pit Project; Agnico Eagle Mines Limited. - Jan 21, 2019	With respect to the updated WMP the Board notes amongst others CIRNAC's concerns regarding "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" which is a Term and Condition within the Nunavut Impact Review Board (NIRB) Project Certificate (PC).	While the Board generally concurs with CIRNAC's concerns the Board does also acknowledge and understand the rational and conclusions provided by Agnico Eagle and has approved the Water Management Plan Version 3 October 2018 through the Board Motion No. 2018-A1-025, dated January 21, 2019, as required by Part B, Item 15 of Licence. However, the Board looks forward for further verification of numerical model predictions with the November 2018 hydraulic gradient estimations from the Westbay well system in combination with the site-specific conductivity measurements, within the 2018 Annual Report's updated document.	Agnico Eagle completed the Whale Tail Post-Closure Pit Lake Thermal Assessment and updated the hydrogeological assessment and modelling. The results of these studies were presented to CIRNAC in July 2018 and confirmed the insignificant horizontal groundwater flows observed at the Whale Tail Site. As per the October 2018 meeting, Agnico Eagle committed to the collection of additional hydraulic data from the Westbay multiport well but not to the installation of additional wells. Vertical flow gradients are effectively evaluated with the Westbay well system installed at the Site, which allows the measurement of hydraulic head below Whale Tail Lake at multiple depth intervals in the unfrozen bedrock. Sampling of the groundwater and measurement of the vertical gradient was completed in November 2018 and will be included in the annual report…	2018 Groundwater Management Monitoring Report in Appendix 38 of the 2018 Annual Report
NWB	WT	Approval letter - Updated Water Quality and Flow Monitoring Plan, Water Management Plan and Waste Rock Management Plan; Type "A" Water Licence No. 2AM-WTP1826, Whale Tail Pit Project; Agnico Eagle Mines Limited. - Jan 21, 2019	With respect to the updated WMP the Board notes amongst others CIRNAC's concerns regarding "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" which is a Term and Condition within the Nunavut Impact Review Board (NIRB) Project Certificate (PC).	While the Board generally concurs with CIRNAC's concerns the Board does also acknowledge and understand the rational and conclusions provided by Agnico Eagle and has approved the Water Management Plan Version 3 October 2018 through the Board Motion No. 2018-A1-025, dated January 21, 2019, as required by Part B, Item 15 of Licence. However, the Board looks forward for further verification of numerical model predictions with the November 2018 hydraulic gradient estimations from the Westbay well system in combination with the site-specific conductivity measurements, within the 2018 Annual Report's updated document.	Horizontal groundwater flow would be expected below the sub-permafrost (at depths of 425 to 495 m bgs). This flow system are and will be controlled by the regional lakes with open taliks and is effectively estimated by lake elevations (in areas of continuous permafrost these lakes act as large diameter monitoring wells) and numerical modelling undertaken to date. The flux of groundwater between Whale Tail Lake to this sub-permafrost flow system can be estimated by the calculation of the vertical flow rate through the talik connecting the Lake to the sub-permafrost flow system, which in turn has been predicted using numerical modelling and will be field verified using the November 2018 hydraulic gradient estimated from the Westbay well system, in combination with the site-specific hydraulic conductivity measurements.	2018 Groundwater Management Monitoring Report in Appendix 38 of the 2018 Annual Report Groundwater Monitoring Plan - Whale Tail, Version 2.1
NWB	WT	Approval letter - Updated Water Quality and Flow Monitoring Plan, Water Management Plan and Waste Rock Management Plan; Type "A" Water Licence No. 2AM-WTP1826, Whale Tail Pit Project; Agnico Eagle Mines Limited. - Jan 21, 2019	With respect to the updated WRMP the NWB would like to highlight CIRNAC's valid concern that based on AEM's model predictions, the waste rock storage facility (WRSF) cover needs to be at least 4.7 meter thick and be constructed with 100% "clean" waste rocks (i.e. Non Potential Acid Generation (NPAG) and Non Metal Leaching (NML) waste rocks) or be contaminant-free (i.e. free of any Potential Acid Generation (PAG) waste rocks and free of any Metal Leaching (ML) waste rocks). The Whale Tail Waste Rock Management Plan needs to be developed such that, if implemented, no PAG waste rocks or ML waste rocks would be misidentified and misplaced in the cover. The Board acknowledges Agnico Eagle's response that ARD-ML Sampling and Testing Plan Appendix B "Flow Chart for Waste Rock delineation and segregation" shown below; Step 4: Rock segregation and management gives implementable details on how the two (2) different types of waste (i.e. NPAG and NML and PAG and/or ML) will be disposed of during Operations. Agnico Eagle would like to clarify that waste rock segregation is not based only on rock type or lithology but rather on operational ARD-ML testing results. The NWB does not necessarily object that the set of procedures for segregation and monitoring of the waste rock material presented in the Operational Acid Rock Drainage (ARD)/ Metal Leaching (ML) Testing and Sampling Plan is thorough and gives implementable details on how the two (2) different types of waste (i.e. NPAG and NML and PAG and/or ML) will be disposed of during Operations, and the Board also acknowledges Agnico Eagle's commitment: Monitoring will be carried out during all stages of the operation to demonstrate geotechnical stability, safe environmental performance of the facility and efficiency of the waste management procedures. If any non-compliant conditions are identified, adaptive management including modification of waste management practices and planning for corrective measures will be completed in a timely manner to ensure the environmental performance of the Whale Tail WRSF, the protection of the environment and that regulatory requirements are met.	Given the short operational period of mine activities the monitoring and adaptive management are very important steps and the NWB strongly recommends Agnico Eagle to implement the proposed number of methods in order to assess and monitor the performance of the waste rock management procedure.		Update Operational ARD-ML Testing and Sampling Plan submitted in Appendix 51 of the 2018 Annual Report
ECCC	WT	Agnico Eagle Mines – Meadowbank Division Responses to CREMP Addendum MMP ECCC Comments - October 17, 2018 - mercuryp lan	As per Section 2.1 of the Mercury Monitoring Plan, sampling areas will include near-field and far-field locations and reference lakes. Mid-field locations have not been included in the plan. The use of mid-field locations may provide important additional information, should near-field results exceed predictions or should near-field levels increase more rapidly than anticipated. The Whale Tail Core Receiving Environment Monitoring Program (CREMP), which includes Lake A76 as a mid-field area, describes Lake A76 as situated at the junction of the two flow paths leading to Lake DS1, which is the far-field site. The Whale Tail CREMP states that "Given its morphology and location, it represents an ideal mid-field exposure area for both flow paths".	ECCC recommends that suitable mid-field locations be added to the Mercury Monitoring Plan in order to allow for the collection of additional (i.e., tiered) monitoring data, in the event that near-field monitoring results exceed predictions and/or near-field levels increase more rapidly than anticipated. Lake A76 may provide suitable mid-field sampling locations. As these recommendations have not been fully addressed at this time, ECCC recommends that AEM provide full responses to recommendations #1, 4 and 5 in the 2018 annual report.	The utility of the mid-field station is primarily driven by study design. At present, the design is a before/after/control/impact study design with a few downstream sampling locations to address regulatory concerns during the hearings. Although Agnico Eagle will review the 2018 Hg monitoring results with our consultants and academic partner at University of Waterloo (UofW) and determine the utility in adding a mid-field sampling station or gradient design; however, at present, Agnico Eagle believes the monitoring plan is sufficiently designed to address regulatory review comments.	Update Mercury Monitoring Plan in Appendix 51 of the 2018 Annual Report
ECCC	WT	Agnico Eagle Mines – Meadowbank Division Responses to CREMP Addendum MMP ECCC Comments - October 17, 2018 - mercuryp lan	As per Section 2.1 of the Mercury Monitoring Plan, fish sampling for tissue analysis will be conducted in deeper-water basins, targeting Lake Trout, in order to compare measurements to predicted tissue concentrations from the Final Environmental Impact Statement..	ECCC recommends that Agnico Eagle Mines Ltd. (the Proponent) clarify if and how any small-bodied fishes will be sampled and analyzed under this plan, and whether there are opportunities to use planned lethal samples from the standard Whale Tail CREMP program for lethal sampling and whole-body analysis for the Mercury Monitoring Plan.	Agnico Eagle will continue to review the monitoring plan with our consultants and partners at the UofW. In collaboration with the UofW, the following specific methods related to surveillance and analysis of small bodied fish populations are planned to be included as part of this study: • Shoreline electrofishing and/or visual surveys, both before and after flooding. Key variable investigated: catch per unit effort (electrofishing seconds); • Collection of small-bodied fishes for analysis of trophic ecology and growth parameters, both before and after flooding. Key variables investigated: sources of carbon (pelagic or benthic), trophic position, growth rates, condition; and • Presence-only surveys, after flooding. Key variable investigated: fish presence in newly flooded habitats, and relationships with habitat covariates.. Since flooding activities are planned to occur over a relatively short term (2-3 years), the UofW that will be an extension of the Hg Monitoring Plan and CREMP will include a study with a focus on small-bodied fish, which are expected to react first to changes in water quality. Changes in primary productivity, as well as growth, condition, and mercury concentrations in small-bodied fish will be related to water quality variables and changes in lake morphometry (especially area). Use of newly flooded habitats by small-bodied fish will also be assessed and related to habitat characteristics using presence-only surveys. Data will be optimized between CREMP sampling, EEM work, fishouts and Hg monitoring program.	Update Mercury Monitoring Plan in Appendix 51 of the 2018 Annual Report

ECCC	WT	Agnico Eagle Mines – Meadowbank Division Responses to CREMP Addendum MMP ECCC Comments - October 17, 2018 - mercuryp lan	The Mercury Monitoring Plan describes supplemental sampling methods that will be implemented as part of the CREMP to track concentrations of mercury in the aquatic environment. However, the Plan does not indicate whether other relevant water quality parameters (e.g., pH, temperature, dissolved organic carbon, total suspended solids, chlorophyll) will be monitored.	ECCC recommends ensuring that supporting water quality data is collected concurrently with mercury monitoring, in order to support the interpretation of mercury monitoring results.	Agnico Eagle agrees with this recommendation and will refer to CREMP water quality results to support the Hg monitoring results.	Update Mercury Monitoring Plan in Appendix 51 of the 2018 Annual Report
ECCC	WT	Agnico Eagle Mines – Meadowbank Division Responses to CREMP Addendum MMP ECCC Comments - October 17, 2018 - mercuryp lan	The Mercury Monitoring Plan (Sections 2.2 and 5) indicates that sediment grab samples will be collected, and that measured concentrations will be compared to baseline values. It is ECCC's opinion that this sampling method is unlikely to achieve the intended goal of tracking the effects of project-related flooding on sediment mercury levels. Given the low deposition rates of northern lakes, grab samples would likely result in the sampling and mixing of both pre-flooding sediments and post-flooding sediments.	ECCC recommends using sediment core sampling as it would be better suited to the purpose of the Mercury Monitoring Plan. The sediment core sampling method allows isolation of sediment layers, which would support the analysis of pre- and post-flooding sediments as distinct samples. As these recommendations have not been fully addressed at this time, ECCC recommends that AEM provide full responses to recommendations #1, 4 and 5 in the 2018 annual report.	Agnico Eagle will review the 2018 monitoring results, consult with UofW and consider this recommendation for future sampling of sediment.	Update Mercury Monitoring Plan in Appendix 51 of the 2018 Annual Report
ECCC	WT	Agnico Eagle Mines – Meadowbank Division Responses to CREMP Addendum MMP ECCC Comments - October 17, 2018 - mercuryp lan	As per Section 3 of the Plan, surface water samples will be collected as surface level grabs rather than at a 3 m depth using a pump and tubing, which is the protocol for regular CREMP samples. ECCC notes that collecting surface level grabs only will not provide data regarding vertical water quality. ECCC also notes that the goal of tracking changes in mercury flux between sediment and overlying water (Section 5) might not be fully addressed if only surface level grabs are collected.	ECCC recommends that the Proponent provide the rationale for collecting surface level grabs only. In addition, ECCC recommends a discussion be provided to explain if and how vertical differences in mercury concentrations will be monitored. Vertical monitoring during periods of stratification should also be discussed and addressed. As these recommendations have not been fully addressed at this time, ECCC recommends that AEM provide full responses to recommendations #1, 4 and 5 in the 2018 annual report.	Agnico Eagle will review the 2018 monitoring results, consult with UofW, our CREMP consultants and consider this recommendation for future sampling of water. An explanation will be provided in future annual reporting.	Update Mercury Monitoring Plan in Appendix 51 of the 2018 Annual Report
NWB	WT	Updated Operational ARD/ML Sampling and Testing Plan, Groundwater Monitoring Plan; Type "A" Water Licence No. 2AM-WTP1826, Whale Tail Pit Project; Agnico Eagle Mines Limited. Letter received January 28,2019	On January 17, 2019, CIRNAC advised the Board that CIRNAC notes that AEM did not provide any new information or analysis to address CIRNAC's two remaining concerns (i.e., CIRNAC comments and recommendations #11 and #19). CIRNAC's Comment #11 is regarding Agnico Eagle's statement within the S. 3.1 of ARD/ML Plan that "the Geology Superintendent may vary the default frequency based on his knowledge from previous drilling and from visual inspections depending on where the drill pattern is situated and which rock type is encountered". While this may be a general operational practice the NWB would like to highlight that based on Agnico Eagle's predictions the waste rock storage facility (WRSF) cover needs to be at least 4.7 meter thick and be constructed with 100% "clean" waste rocks (i.e. Non Potential Acid Generation (NPAG) and Non Metal Leaching (NML). Therefore, the Board concurs with CIRNAC recommendation that the rationale for any such changes be clearly documented and implemented only with the prior approval of the NWB. CIRNAC's Comment #19 is associated with the uncertainty regarding AEM's assumption there would be zero cover "contamination" (i.e., inadvertent inclusion of waste rock with elevated ARD/ML) potential into the cover. CIRNAC recommended that a sampling/testing program be conducted of the cover materials both before placement (i.e., from the NPAG/NML stockpile) and after placement (i.e., from the cover itself). This program should be designed to include the collection of representative cover material samples and long-term kinetic testing. The analysis program should be initiated no later than one year prior to closure and the results of the ongoing study should be reported annually. Information from the kinetic testing would help to inform the final design of the cover and any long-term management decisions for the site (e.g., the duration of post-closure monitoring). The NWB does acknowledge Agnico Eagle response to CIRNAC comment that sampling and segregation procedure detailed in the ARD-ML plan is robust and QA-QC practices are in place to assess the process. In addition, the shape of the WRSF will not allow proper sampling of the thermal cover after placement. The Board notes that the ARD/ML Plan proposes a monitoring program that will be carried out during all stages of the operation to demonstrate geotechnical stability, safe environmental performance of the facility and efficiency of the waste management procedures. The NWB is of opinion that the monitoring of efficiency of the waste management procedures during operations could justify the need of cover materials' sampling/testing program recommended by CIRNAC, and requires Agnico Eagle to assess accordingly the findings of its monitoring within the updated plan prior to the final closure and reclamation planning. In the interim, the Board requires the Applicant to implement the proposed number of methods in order to assess and monitor the performance of the waste rock sampling and segregation procedure. The Board hereby approves the Operational ARD/ML Sampling and Testing Plan Version 3, November 2018 through the Board Motion No. 2018-A1-026, dated January 28, 2019, as required by Part B, Item 13 of the Licence. However, the Licensee shall ensure that any changes of field sampling procedure should be implemented after the NWB approval of these changes. The future update to the plan should reflect this recommendation.			Update Operational ARD-ML Testing and Sampling Plan submitted in Appendix 51 of the 2018 Annual Report
NWB	WT	Updated Operational ARD/ML Sampling and Testing Plan, Groundwater Monitoring Plan; Type "A" Water Licence No. 2AM-WTP1826, Whale Tail Pit Project; Agnico Eagle Mines Limited. Letter received January 28,2019	On October 3, 2018, the NWB distributed the GWMP for a public review with a deadline set at October 22, 2018. On October 22, 2018, comments were received from CIRNAC and ECCC. On November 9, 2018, Agnico Eagle provided a response package along with a further updated GWMP Version 2, November 2018. On November 29 and 30, 2018, ECCC and CIRNAC, respectively, raised follow-up questions, and on January 15, 2019, Agnico Eagle provided additional responses to Interveners questions. The NWB asked Interveners to advise the Board by January 17, 2019, on whether or not Agnico Eagle additional responses address their concerns. On January 17, 2019, CIRNAC strongly recommended the NWB not approve the November 2018 Version 2 Groundwater Monitoring Plan for the Whale Tail Pit Project as it does not satisfy the objectives of a groundwater monitoring plan based on unresolved comment #2 (incorporation of well monitoring) and comment #3 (thermal monitoring)... CIRNAC will continue to work with AEM and the NWB to resolve the outstanding comments, as they are essential to achieve the objective of a Groundwater Monitoring Plan. CIRNAC comment #2 stated that the plan does not identify any groundwater monitoring wells (i.e. the installed 2016 Westbay Multiport Well System) in the Groundwater Monitoring Plan for monitoring during operations nor closure of the Whale Tail Pit Project. Without identifying the only active groundwater well, the 2016 Westbay Multiport Well System, in the Groundwater Monitoring Plan, AEM has effectively determined no groundwater monitoring wells will be monitored during operations and closure – which is unacceptable to CIRNAC. While the NWB realizes the potential expense and difficulty of installing monitoring wells beneath the permafrost the Board concurs with CIRNAC and ECCC that deep groundwater flow and quality monitoring (i.e. existing Westbay Multiport Well System) in flow paths adjacent to the pit will help to better characterize the hydrogeological setting and assess potential water quality impacts from the project during closure and post-closure phases. The Board is of opinion thatAgnico Eagle should consider deep groundwater monitoring or provide a strong rational on why it doesn't intent to monitor even the Westbay multilevel well. in its correspondence of January 17, 2019 regarding the comments #3 (thermal monitoring) CIRNAC stated that CIRNAC requested thermal monitoring be included in the Groundwater Monitoring Plan to: - validate and monitor the horizontal hydrogeological profile assumptions that continuous permafrost surrounding the Whale Tail Lake talik negates horizontal hydrogeological flow, in particular in the vicinity of the Whale Tail Pit 'north wall' area where metal leaching is of concern; and - validate and monitor the vertical hydraulic head and groundwater quality changes in the AEM designated open and closed Whale Tail Lake talik during operations and closure. The NWB acknowledges Agnico Eagle's response that long-term closure predictions with respect to arsenic loading are not expected to be affected by the assumption of an open or closed talik, as the permafrost will eventually degrade below the pit foot print and connect the shallow talik to the deeper flow system. Maximum rates of discharge from the pit lake presented in Agnico's Eagle's response to CIRNAC's recommendation regarding "Background, Results of Review" would still be applicable (maximum inflow of 13 m3/day to an outflow of 11 m3/day). The predicted and estimated maximum flows are negligible compared to the 3,000,000+ m3 of surface water exchanged annually post-closure when flows are re-established, based on average climate year watershed runoff.	The NWB advises the Licensee that an approval of the Groundwater Monitoring Plan as submitted will be withheld at this time and the Licensee is requested to revise the plan and re-submit for approval within the 2018 Annual Report, taking into consideration the results of parties review. More particularly, Agnico Eagle should provide options for the monitoring of Westbay Multiport Well System or potential additional monitoring well and discuss thermal analysis associated with the concerns of metal leaching around the pit's north wall area. Agnico Eagle is encouraged to continue to work directly with parties to address these issues within the revised plan.		Groundwater Monitoring Plan - Whale Tail, Version 2.1 (Appendix 51) submitted in February 2019 and waiting for NWB approval

Table 8.1: 2018 GPS Coordinates of Meadowbank and Whale Tail Sites Sampling Stations

Sample Location Description	Site	Sample ID	GPS Coordinates Easting / Northing
MEADOWBANK			
MDMER and EEM			
Portage Attenuation Pond effluent water quality monitoring and toxicity testing	Meadowbank	ST-9 / ST-MMER-1	14W 0637593 7215174
Vault effluent water quality monitoring and toxicity testing	Meadowbank	ST-10 / ST-MMER-2	15W 0359842 7219555
East Dike Seepage effluent water quality monitoring and toxicity testing	Meadowbank	ST-8 / ST-MMER-3	14W 0639336 7213920
Portage Attenuation Pond water quality monitoring in receiving environment - discharge area	Meadowbank	TPN	14W 0636531 7214581
East Dike Seepage water quality monitoring in receiving environment - discharge area	Meadowbank	SPLE	14W 0639459 7213913
Vault water quality monitoring in receiving environment - discharge area	Meadowbank	WLE	15W 0360880 7220513
Water quality monitoring in receiving environment - reference area	Meadowbank / Whale Tail	TPS	14W 0633840 7208079
Sewage Treatment Plant			
STP discharge to stormwater management pond	Meadowbank	STP	14W 0638042 7214140
Incinerator			
Ash sampling; waste oil sampling	Meadowbank	Incinerator	14W 0638189 7213412
Meadowbank Bulk Fuel Storage Facilities			
Water quality monitoring of discharge from secondary containment area	Meadowbank	ST-37	14W 0638258 7213430
Baker Lake Bulk Fuel Storage Facility			
Water quality monitoring of discharge from secondary containment area for Jet-A tank	Baker Lake	ST-38	15W 0357487 7134617
Water quality monitoring of discharge from secondary containment area for new tank 5-6	Baker Lake	ST-40.1	15W 0357598 7134539
Water quality monitoring of discharge from secondary containment area for old tank 1-4	Baker Lake	ST-40.2	15W 0357543 7134445
Tailings Reclaim Pond			
Water quality monitoring in North Cell	Meadowbank	ST-21 North Cell	14W 0637608 7215745
Water quality monitoring in South Cell	Meadowbank	ST-21 South Cell	14W 0638166 7215045
Attenuation Pond			
Water quality monitoring from area of water accumulation Vault Attenuation Pond	Meadowbank	ST-25	15W 0359030 7219607
Water Quality monitoring from area of water accumulation in Phser Attenuation Pond	Meadowbank	ST-43	14W 0640620 7219169
Pit Sump			
Water quality monitoring from area of water accumulation in North Portge Pit Sump	Meadowbank	ST-17	14W 0638951 7214783
Water quality monitoring from area of water accumulation in South Portage Pit Sump	Meadowbank	ST-19	14W 0638604 7214240
Water quality monitoring from area of water accumulation in Bay Goose Pit Sump	Meadowbank	ST-20 Sump	14W 0638339 7212681
Water quality monitoring from area of water accumulation in Vault Pit Sump	Meadowbank	ST-23	14W 0640865 7220103
Water Quality monitoring from area of water accumulation in Phaser Pit Sump	Meadowbank	ST-41	14W 0640432 7219657
Water Quality monitoring from area of water accumulation in BB Phaser Pit Sump	Meadowbank	ST-42	14W 0640343 7219369
Pit Lake			
Water quality monitoring from area of water accumulation in Bay Goose Pit Lake	Meadowbank	ST-20 Lake	14W 0638692 7212294
Seepage			

Sample Location Description	Site	Sample ID	GPS Coordinates Easting / Northing
Water quality monitoring of seepage from East Dike	Meadowbank	ST-S-1	14W 0639316 7213937
Water quality monitoring of seepage from Saddle Dam 1	Meadowbank	ST-S-2	14W 0636977 7216000
Water quality monitoring of seepage from Central Dike	Meadowbank	ST-S-5	14W 0638743 7214571
Water Quality monitoring of seepage from Saddle Dam 3	Meadowbank	ST-32	14W 0637499 7214966
Water Quality monitoring of seepage from Assay Road Seepage	Meadowbank	Assay Road Seepage	

Sample Location Description	Site	Sample ID	GPS Coordinates Easting / Northing
Rock Storage Facility			
Water quality monitoring of seepage from Portage Waste Rock Storage Facility	Meadowbank	ST-16	14W 0638617 7216164
Water quality monitoring of seepage from Vault Waste Rock Storage Facility	Meadowbank	ST-24	14W 0640919 7220711
Landfarm			
Discharge to the land from landfarm sump	Meadowbank	ST-14	14W 0637537 7215195
Discharge to the land from landfarm sump	Meadowbank	ST-14b	TBD
Diversion Ditch Non-Contact Water			
Portage Area (West) diversion ditch (North Cell Diversion Ditch)	Meadowbank	ST-6	14W 0636771 7216026
Portage area (East) diversion ditch around RSF	Meadowbank	ST-5	14W 0638732 7216495
West Extension Pool			
Water Quality monitoring of seepage from RSF - WEP1	Meadowbank	ST-30	14W 0638419 7216707
Water Quality monitoring of seepage from RSF - WEP2	Meadowbank	ST-31	14W 0638625 7216557
Receiving environment Seepage Monitoring			
Water Quality monitoring from area of water accumulation	Meadowbank	NP2-South	14W 0638676 7216229
Water Quality monitoring from area of water accumulation	Meadowbank	NP2-East	14W 0638995 7216210
Water Quality monitoring from area of water accumulation	Meadowbank	NP2-West	14W 0638716 7216490
Water Quality monitoring from area of water accumulation	Meadowbank	NP1-West	14W 0639298 7216165
Water Quality monitoring from area of water accumulation	Meadowbank	NP2-Winter	14W 0638704 7216279
Water Quality monitoring from area of water accumulation	Meadowbank	Dogleg-North	14W 0639518 7215861
Water Quality monitoring from area of water accumulation	Meadowbank	SPL-RSF	14W 0639618 7214713
Water Quality monitoring from area of water accumulation	Meadowbank	TPL-Assay	14W 0637751 7213743
Water Level Survey			
Third Portage Lake	Meadowbank	TPL-Survey	14W 0637349 7213742
Second Portage Lake	Meadowbank	SPL-Survey	14W 0639401 7214293
Vault Attenution Pond A	Meadowbank	Pond A	14W 0641169 7220663
Vault Attenution Pond B	Meadowbank	VL-IN	14W 0641931 7220594
Vault Attenution Pond C	Meadowbank	Pond C	14W 0641827 7219761
Vault Attenution Pond D	Meadowbank	Pond D	14W 0641201 7219766
Wally Lake	Meadowbank	WL-Survey	14W 0642749 7220846
Whale Tail			
MDMER and EEM			
Whale Tail North Basin effluent water quality monitoring and toxicity testing	Whale Tail	ST-MDMER-4	14W 0607629 7255350
Whale Tail North water quality monitoring in receiving environment - discharge area	Whale Tail	WTN	14W 0607405 7255302
Sewage Treatment Plant			
STP discharge Whale Tail South	Whale Tail	MEA-2	14W 0607713 7255383
Incinerator			
Ash sampling	Whale Tail	Incinerator	14W 0607531 7256768
Rock Storage Facility			

Sample Location Description	Site	Sample ID	GPS Coordinates Easting / Northing
Water quality monitoring of seepage from Whale Tail Waste Rock Storage Facility	Whale Tail	ST-WT-3	14W 0605648 7256041
Lake Monitoring			
Water Quality monitoring of Lake A47	Whale Tail	ST-WT-6	14W 0607070 7256485
Water Quality monitoring of Lake A16 outlet	Whale Tail	ST-WT-14	14W 0603424 7254297
Water Quality monitoring of Lake A15	Whale Tail	ST-WT-15	14W 0603444 7254501
Dike Construction			
Water Quality monitoring during Whale Tail Dike Construction	Whale Tail	ST-WT-DC-1	14W 607408 7254176
	Whale Tail	ST-WT-DC-2	14W 607565 7254178
	Whale Tail	ST-WT-DC-3	14W 607690 7254225
	Whale Tail	ST-WT-DC-4	14W 607804 7254317
Broad Survey Dike Construction			
Water Quality monitoring in Whale Tail South Basin	Whale Tail	ST-WT-BS1	14W 0607506 7253906
	Whale Tail	ST-WT-BS2	14W 0607204 7253497
	Whale Tail	ST-WT-BS3	14W 0607391 7253223
	Whale Tail	ST-WT-BS4	14W 0607449 7252757
Water Quality monitoring in Mamomth Lake	Whale Tail	ST-MAM-BS1	14W 0605431 7254881
	Whale Tail	ST-MAM-BS2	14W 0605203 7254833
	Whale Tail	ST-MAM-BS3	14W 0604984 7254747
	Whale Tail	ST-MAM-BS4	14W 0604476 7254405
Containment discharge			
Water Quality monitoring of AP-5 Containmnt Area Discharge	Whale Tail	MEA-4	14W 0607369 7255939
Water Level Survey			
Whale Tail Lake North Basin	Meadowbank	WTS - Survey	14W 0607779 7254715
Whale Tail Lake South Basin	Meadowbank	WTN - Survey	14W 0607494 7255299
Mammoth Lake	Meadowbank	MAM - Survey	14W 0606053 7255188

Table 8.2 Meadowbank 2018 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											
3-Jan-18	0.0025	0.0023	< 0.001	< 0.0003	0.0005	0.005	3	NMR	8.53	NMR	NMR
8-Jan-18	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.59	NMR	NMR
15-Jan-18	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.74	NMR	NMR
23-Jan-18	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	8.21	NMR	NMR
29-Jan-18	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.52	NMR	NMR
February											
6-Feb-18	< 0.0005	0.001	< 0.001	0.0041	0.0015	< 0.001	4	< 0.002	8.31	NMR	NMR
13-Feb-18	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	7.29	0	10
21-Feb-18	NMR	NMR	NMR	NMR	NMR	NMR	22	NMR	7.68	NMR	NMR
26-Feb-18	NMR	NMR	NMR	NMR	NMR	NMR	13	NMR	7.93	NMR	NMR
March											
5-Mar-18	< 0.0005	0.0013	0.002	0.0008	< 0.0005	0.002	6	NMR	7.39	NMR	NMR
11-Mar-18	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.57	NMR	NMR
15-Mar-18	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.34	NMR	NMR
19-Mar-18	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	7.26	NMR	NMR
27-Mar-18	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.41	NMR	NMR
April											
2-Apr-18	0.0009	0.0023	< 0.001	< 0.0003	0.0014	0.015	12	< 0.002	7.82	0	0
9-Apr-18	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.56	NMR	NMR
17-Apr-18	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.08	NMR	NMR
22-Apr-18	NMR	NMR	NMR	NMR	NMR	NMR	10	NMR	7.60	NMR	NMR
30-Apr-18	NMR	NMR	NMR	NMR	NMR	NMR	15	NMR	7.13	NMR	NMR
May											
8-May-18	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	7.31	NMR	NMR
14-May-18	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	NA	NMR	NMR
21-May-18	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	7.24	NMR	NMR
28-May-18	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	6.67	NMR	NMR
June*											
NDEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NDEP	NDEP
NDEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NDEP	NDEP
NDEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NDEP	NDEP
NDEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NDEP	NDEP
July											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
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
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
22-Aug-18	< 0.0005	0.0008	0.001	< 0.0003	0.0015	0.001	< 1	0.005	7.69	NMR	NMR
27-Aug-18	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.50	NMR	NMR
September											
3-Sep-18	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.37	NMR	NMR
10-Sep-18	< 0.0005	< 0.0005	0.001	< 0.0003	< 0.0005	< 0.001	1	0.006	7.24	0	0
17-Sep-18	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	7.55	NMR	NMR
24-Sep-18	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.38	NMR	NMR

October											
1-Oct-18	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	7.15	NMR	NMR
8-Oct-18	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	6.30	NMR	NMR
15-Oct-18	< 0.0005	< 0.0005	< 0.001	< 0.0003	< 0.0005	< 0.001	5	0.005	7.38	NMR	NMR
22-Oct-18	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.33	NMR	NMR
29-Oct-18	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	6.95	NMR	NMR
November											
5-Nov-18	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	7.24	NMR	NMR
12-Nov-18	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.66	NMR	NMR
19-Nov-18	< 0.0005	0.0006	< 0.001	< 0.0003	< 0.0005	< 0.001	2	< 0.002	7.35	NA2	NA2
26-Nov-18	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.03	NMR	NMR
December											
3-Dec-18	NMR	NMR	NMR	NMR	NMR	NMR	NA1	NMR	NA1	NMR	NMR
10-Dec-18	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.76	NMR	NMR
17-Dec-18	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.66	NMR	NMR
27-Dec-18	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	8.01	NMR	NMR

NDEP :No Deposit

NMR: No Measurement Required

* Discharge stopped on June 3, 2018

**Discharge restarted on August 21, 2018

NA - pH not measured following technician omission.

NA1 - no sample was collected at East Dike Discharge Effluent (ST-MDMER-3) for the week of December 2nd to December 8th , 2018 as required by MDMER Division 2 Section 12(1). The sample was supposed to be taken on December 3rd, 2018 but because of plane delays the sample had to be cancelled. Agnico was supposed to resample the following day, on December 4th, 2018, but field execution prevented the sample from being retaken and thus no samples were taken during the aforementioned week. The Total Suspended Solids (TSS) results for the week before (2 mg/L) and after (3 mg/L) that week were below the authorized limit discharge as per Schedule 4. Notice sent ot ECCC Inspector on January 23, 2019

NA2 - no acute lethality testing for trout and daphnia was conducted in the forth quarter of 2018 as per the MDMER Section 16(1). The quarterly sample was taken on November 19th, as planned, and was sent by our charter plane the same day. On November 22nd, 2018, the accredited laboratory sent a notice to only one technician of the Environmental Department staff to let him know that the sample had arrived frozen and that the analysis could not be performed. When this notification was sent, the environmental technician was not on site anymore, as his rotation was complete. He had left site on the 21st November. Since nobody else within our team had received the notification, it was therefore impossible for Agnico to be aware of the sample being rejected and thus, no other sample was collected. Upon review of 4th quarter, as per MDMER 21(1) and expecting results, our compliance technician requested update from the Laboratory and this is when we were made aware of the situation. Upon further investigation, it appears that the sample was received in good condition from our charter delivery to H2Lab based in Val-d'Or. H2Lab then subcontracts a third-party laboratory to perform the lethality testing (Eurofin). It is that shipment, completed and organized by H2Lab that arrived frozen at Eurofin based in Quebec City. Our department had no reasonable doubt to think the sample was rejected since a sublethal testing (required by MDMER Schedule 5 Section 5(1)) was also performed and shipped on the same day, but shipped directly to a different lab (Aquatox, based in Guelph, Ontario). This sample arrived at the laboratory in a proper state. Notice sent ot ECCC Inspector on February 8, 2019.

Table 8.3: Meadowbank 2018 East Dike MDMER Volume

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
1	616	509	587	429	612	932	0	0	465	401	382	366	
2	537	349	605	420	620	914	0	0	462	403	381	365	
3	537	356	611	377	615	809	0	0	454	400	381	356	
4	537	339	599	233	584	0	0	0	458	399	381	364	
5	537	341	515	414	625	0	0	0	481	397	381	363	
6	537	473	604	647	624	0	0	0	474	396	380	358	
7	537	574	613	620	622	0	0	0	479	395	380	362	
8	678	495	606	620	613	0	0	0	474	390	376	357	
9	617	531	608	591	624	0	0	0	469	388	380	360	
10	611	565	618	590	630	0	0	0	468	393	379	359	
11	651	594	618	596	621	0	0	0	467	393	378	358	
12	620	554	617	570	631	0	0	0	464	387	378	349	
13	616	488	621	608	633	0	0	0	461	391	377	357	
14	615	454	625	616	630	0	0	0	450	391	376	349	
15	607	335	619	611	620	0	0	0	451	390	376	355	
16	633	558	626	609	623	0	0	0	448	390	376	355	
17	612	501	598	599	627	0	0	0	444	389	375	346	
18	536	413	612	574	627	0	0	0	435	388	367	354	
19	527	521	612	590	628	0	0	0	438	388	374	354	
20	593	415	603	600	617	0	0	0	436	383	374	352	
21	544	370	515	611	608	0	0	254	433	389	372	352	
22	607	596	602	616	607	0	0	501	431	387	372	346	
23	496	603	614	615	595	0	0	500	428	387	371	350	
24	360	601	619	617	594	0	0	496	425	386	366	350	
25	345	594	615	616	597	0	0	491	422	385	368	349	
26	380	604	615	611	572	0	0	485	412	380	368	349	
27	420	604	625	619	607	0	0	480	415	385	361	345	
28	499	600	610	617	618	0	0	470	413	384	367	348	
29	513		601	613	622	0	0	472	410	383	366	348	
30	343		562	614	623	0	0	468	408	379	365	347	
31	380		498		611		0	467		383		347	
Total (m^3)	**16,638**	**13,937**	**18,592**	**17,062**	**19,078**	**2,654**	**0**	**5,084**	**13,372**	**12,078**	**11,226**	**10,968**	**140,690**

Table 8.4: Meadowbank 2018 East Dike EEM Monitoring

ST-MMER-3-EEM	Sample Date	2/6/2018	9/10/2018	10/15/2018	11/19/2018
Parameters	**Units**				
Field Measured					
pH	pH units	8.31	7.24	7.42	7.35
Conductivity	µs/cm	87.5	108.9	70.9	76.2
Temperature	°C	0.5	8.9	3.8	4.1
Conventional Parameters					
Alkalinity	mg CaCO3/L	28	28	26	28
Hardness	mg CaCO3/L	22	40	21	26
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.07	0.27	0.04	0.06
Ammonia (NH3)	mg/L	<0.01	<0.01	< 0.01	<0.01
Ammonia Nitrogen	mg/L	0.01	< 0.01	< 0.01	< 0.01
Total Metals					
Aluminum	mg/L	0.042	0.031	<0.005	0.037
Cadmium	mg/L	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Iron	mg/L	0.08	0.02	< 0.01	0.04
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Selenium	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005

ST-MMER-1-EEM-TPS	Sample Date	2/5/2018	5/13/2018	9/11/2018	11/18/2018
Parameters	**Units**				
Field Measured					
pH	pH units	7.16	7.11	7.2	6.76
Conductivity	µs/cm	34.5	68.8	38.9	28.7
Temperature	°C	0.19	1.17	8.5	0.51
Dissolved oxygen	mg/L	14.76	14.58	11.7	17.26
Conventional Parameters					
Alkalinity	mg CaCO3/L	10	9	9	11
Hardness	mg CaCO3/L	12	8	7	8
Total suspended solids	mg/L	1	1	1	< 1
Major Ions					
Cyanide	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.03	0.01	0.02	0.01
Ammonia Nitrogen	mg/L	0.03	0.04	< 0.01	< 0.01
Ammonia (NH3)	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Total Metals					
Aluminum	mg/L	<0.006	0.032	< 0.005	< 0.005
Arsenic	mg/L	< 0.0005	0.001	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.00002	0.00002	< 0.00002	< 0.00002
Copper	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Iron	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Selenium	mg/L	< 0.001	< 0.001	< 0.0005	< 0.0005
Zinc	mg/L	< 0.001	0.002	< 0.001	< 0.001

ST-MMER-3-EEM-SPLE	Sample Date	2/5/2018	5/13/2018	9/10/2018	11/18/2018
Parameters	**Units**				
Field Measured					
pH	pH units	7.05	7.01	7.12	7.65
Conductivity	µs/cm	46.6	58.3	48.5	41.9
Temperature	°C	0.35	0.57	8.8	1.49

Dissolved oxygen	mg/L	14.18	17.78	11.86	15.36
Conventional Parameters					
Alkalinity	mg CaCO3/L	15	18	14	16
Hardness	mg CaCO3/L	16	18	13	15
Total suspended solids	mg/L	2	24	< 1	< 1
Major Ions					
Cyanide	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.01	< 0.01	< 0.01	< 0.01
Ammonia Nitrogen	mg/L	< 0.01	0.03	< 0.01	< 0.01
Ammonia (NH3)	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Total Metals					
Aluminum	mg/L	<0.006	0.012	< 0.005	< 0.005
Arsenic	mg/L	< 0.0005	0.0021	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Copper	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Iron	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	0.0025	0.0007	< 0.0005	< 0.0005
Selenium	mg/L	< 0.001	< 0.001	< 0.0005	< 0.0005
Zinc	mg/L	< 0.001	0.001	< 0.001	< 0.001

Table 8.5 2018 Whale Tail dike construction 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
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
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
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
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
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
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
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
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
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
June											
NDEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NDEP	NDEP
NDEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NDEP	NDEP
NDEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NDEP	NDEP
NDEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NPEP	NDEP	NDEP
July											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
Week July 29 to August 4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
August											
6-Aug-18	< 0.0005	< 0.0005	NA1	< 0.0003	0.0006	< 0.001	NA1	NA1	6.60	NMR	NMR
9-Aug-18	< 0.0005	0.0008	0.001	< 0.0003	< 0.0005	< 0.001	< 1	0.003	6.98	NMR	NMR
14-Aug-18	< 0.0005	0.0030	< 0.001	0.0014	0.0017	0.015	7	0.006	7.25	0	0
20-Aug-18	< 0.0005	0.0008	< 0.001	< 0.0003	0.0012	< 0.001	4	0.005	7.03	NMR	NMR
27-Aug-18	< 0.0005	0.0013	< 0.001	0.0023	0.0018	< 0.001	6	0.004	7.11	NMR	NMR
September											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
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
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
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
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
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	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP

NDEP :No Deposit
NMR: No Measurement Required
* Discharge from July 27 to August 27, 2018

NA: As required by MDMER Division 2 Section 12(1), Agnico Eagle did not collected for the week of July 29th to August 4th, 2018 a sample of effluent from the final discharge point. Agnico didn't record the pH and the concentrations of the deleterious substances prescribed in Section 3 for this week. As the discharge started on July 27th there is no sample taken before this week. Analyses of the MDMER data for the following week were all below the authorized limits of deleterious substances. Notification sent to ECCC Inspector on September 06, 2018.

NA1: The weekly sample required by Division 2 Section 12(1) were not analyse for the Cyanide, TSS and Radium 226. When Agnico noticed this error, another sample was taken on August 9th (in the same week) for all parameters required in Division 2 Section 3. Notification sent to ECCC Inspector on September 06, 2018

Table 8.6: 2018 Whale Tail dike construction MDMER Volume

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
1	NA	NA	NA	NA	NA	NA	NA	11830	0	NA	NA	NA	
2	NA	NA	NA	NA	NA	NA	NA	8355	0	NA	NA	NA	
3	NA	NA	NA	NA	NA	NA	NA	12510	0	NA	NA	NA	
4	NA	NA	NA	NA	NA	NA	NA	13175	0	NA	NA	NA	
5	NA	NA	NA	NA	NA	NA	NA	9690	0	NA	NA	NA	
6	NA	NA	NA	NA	NA	NA	NA	14079	0	NA	NA	NA	
7	NA	NA	NA	NA	NA	NA	NA	6745	0	NA	NA	NA	
8	NA	NA	NA	NA	NA	NA	NA	5725	0	NA	NA	NA	
9	NA	NA	NA	NA	NA	NA	NA	9603	0	NA	NA	NA	
10	NA	NA	NA	NA	NA	NA	NA	10340	0	NA	NA	NA	
11	NA	NA	NA	NA	NA	NA	NA	0	0	NA	NA	NA	
12	NA	NA	NA	NA	NA	NA	NA	0	0	NA	NA	NA	
13	NA	NA	NA	NA	NA	NA	NA	0	0	NA	NA	NA	
14	NA	NA	NA	NA	NA	NA	NA	12130	0	NA	NA	NA	
15	NA	NA	NA	NA	NA	NA	NA	13188	0	NA	NA	NA	
16	NA	NA	NA	NA	NA	NA	NA	12550	0	NA	NA	NA	
17	NA	NA	NA	NA	NA	NA	NA	14220	0	NA	NA	NA	
18	NA	NA	NA	NA	NA	NA	NA	15773	0	NA	NA	NA	
19	NA	NA	NA	NA	NA	NA	NA	11260	0	NA	NA	NA	
20	NA	NA	NA	NA	NA	NA	NA	14457	0	NA	NA	NA	
21	NA	NA	NA	NA	NA	NA	NA	23693	0	NA	NA	NA	
22	NA	NA	NA	NA	NA	NA	NA	12665	0	NA	NA	NA	
23	NA	NA	NA	NA	NA	NA	NA	11300	0	NA	NA	NA	
24	NA	NA	NA	NA	NA	NA	NA	10764	0	NA	NA	NA	
25	NA	NA	NA	NA	NA	NA	NA	13306	0	NA	NA	NA	
26	NA	NA	NA	NA	NA	NA	NA	12399	0	NA	NA	NA	
27	NA	NA	NA	NA	NA	NA	2790	2100	0	NA	NA	NA	
28	NA	NA	NA	NA	NA	NA	6012	0	0	NA	NA	NA	
29	NA		NA	NA	NA	NA	15792	0	0	NA	NA	NA	
30	NA		NA	NA	NA	NA	6405	0	0	NA	NA	NA	
31	NA		NA		NA		8681	0		NA		NA	
Total (m^3)	**0**	**0**	**0**	**0**	**0**	**0**	**39,680**	**281,857**	**0**	**0**	**0**	**0**	**321,537**

Table 8.7: 2018 Whale Tail dike construction EEM Monitoring

	Alkalinity	Aluminium	Ammonia	Cadmium	Hardness	Iron	Mercury	Molybdenum	Nitrate	Selenium	T°	pH	O_2	Conductivity	Arsenic	Ra226	TSS	Nickel	Zinc	Lead	Copper	Cyanide	Sub-Lethal Toxicity			
	mg $CaCO_3$/L	mg/L	mg N/L	mg/L	mg $CaCO_3$/L	mg/L	mg/L	mg/L	mg/L	mg/L	°C		mg/L	µS/cm	mg/L	Bq/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	*Ceriodaphia dubia*	*Fathead minnow*	*Lemna minor*	*Pseudokirchneriella subcapitata*
Effluent characterization (65°24'10.82''N 96°40'56.09'' W) (ST-MDMER-4-EEM)																										
6-Aug-18	17	0.244	0.04	< 0.00002	18	0.06	< 0.00001	< 0.0005	0.07	< 0.0005	12.40			46.7									NA	NA	NA	NA
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP			NDEP									NDEP	NDEP	NDEP	NDEP
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP			NDEP												
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP			NDEP												
Water Quality Monitoring Exposure Area (65°24'09.55'' N 96°41'13.57''W) (ST-MDMER-4-EEM-WTN)																										
6-Aug-18	12	0.108	0.02	< 0.00002	17	0.23	< 0.00001	< 0.0005	0.06	< 0.0005	10.93	6.5	10.45	46.7	< 0.0005	NA1	2	0.0012	< 0.001	< 0.0003	0.0005	0.001				
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP				
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP				
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP				
Water Quality Monitoring Reference Area (65°58'10.90'' N 96°09'51.37'' W) (ST-EEM-TPS)																										
6-Aug-18	15	< 0.005	< 0.01	< 0.00002	6	< 0.01	< 0.00001	< 0.0005	0.02	0.0006	9.8	7.67	11.83	31.4	< 0.0005	NMR	1	< 0.0005	< 0.001	< 0.0003	< 0.0005	0.005				
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP				
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP				
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP				

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

NA: No sublethal toxicity has been taken in compliance with Schedule 5 Section 6(1). Agnico had planned to take this toxicity sample on September 3rd but the discharge stopped on August 27th. It was not possible to conduct the sublethal testing before this date since all of the accredited laboratories able to conduct the analysis were overbooked. Notification sent to ECCC Inspector on September 06, 2018

NA1: On August 6th, Agnico conducted the Water quality monitoring as required by Schedule 5 Section 7(1). Radium 226 was not analysed for the exposed area as the bottle was not provided to the accredited laboratory. When Agnico notice the missing parameters, the discharge was already stopped and it was impossible to take a second sample.

Table 8.8: Meadowbank 2018 Non-Contact Water Diversion Ditch Water Quality Monitoring (ST-5)

Sample Date		Annual Average						6/26/2018	7/3/2018	8/8/2018	9/4/2018	10/2/2018
Parameters	**Units**	**2013**	**2014**	**2015**	**2016**	**2017**						
Field Measured												
pH	pH units	-	-	7.08	7.83	8.0		7.28	7.05	-	-	6.57
Conductivity	us/cm	-	-	200.04	201.12	237		140.5	208	-	-	33.6
Temperature	°C	-	-	16.0	12.40	12.78		6.4	7.1	-	-	8.4
Turbidity	NTU	11.13	3.99	5.37	10.69	2.79		5.59	3.08	-	-	1.27
Conventional Parameters												
Total suspended solids	mg/L	6.4	2.8	4	2.8	2.3		<1	< 1	2	< 1	8
Major Ions												
Cyanide	mg/L	0.0106	0.009	0.005	0.007	0.00125		0.003	0.009	0.002	< 0.001	0.008
Sulphate	mg/L	49.22	168.18	55.46	49.06	40.1		12.4	34.2	37.4	46	7.3
Total Metals												
Aluminum	mg/L	-	-	-	-	-		0.136	0.047	< 0.005	0.017	0.036
Arsenic	mg/L	-	-	0.00126	0.00096	0.00125		<0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Copper	mg/L	-	-	0.0056	0.00432	0.0021		0.0071	0.0031	0.0026	0.0018	< 0.0005
Lead	mg/L	-	-	0.00086	0.00096	0.00595		<0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Nickel	mg/L	-	-	0.00376	0.004	0.00465		0.004	0.0054	0.005	0.0035	< 0.0005
Zinc	mg/L	-	-	0.0014	0.001	0.001		<0.001	< 0.001	< 0.001	0.002	0.001
Radionuclides												
Radium-226	mg/L	0.016	0.0037	0.002	0.002	0.002		0.004	0.004	< 0.002	< 0.002	0.006

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.9: Meadowbank 2018 Non-Contact Water Diversion Ditch Water Quality Monitoring (ST-6)

	Sample Date	Annual Average						6/26/2018	7/3/2018	8/7/2018	9/4/2018
Parameters	**Units**	**2013**	**2014**	**2015**	**2016**	**2017**					
Field Measured											
pH	pH units	-	-	6.91	7.66	7.92		7.48	7.38	7.95	7.53
Conductivity	us/cm	-	-	59.62	48.49	38.80		39.4	41.7	38.2	45.4
Temperature	°C	-	-	19.8	14.3	11.25		5.6	4.6	12.8	6.3
Turbidity	NTU	14.56	2.93	9.46	15.94	1.95		1.39	1.89	2.52	3.76
Conventional Parameters											
Total suspended solids	mg/L	3	4.14	11.04	2.2	1.33		<1	< 1	1	< 1
Major Ions											
Cyanide	mg/L	0.007	0.00458	0.0054	0.0064	0.0015		<0.001	< 0.001	< 0.001	< 0.001
Sulphate	mg/L	6.9	7.07	5.42	5.68	6.125		4.9	5.3	5.9	6.3
Total Metals											
Aluminum	mg/L	-	-	-	-	-		< 0.006	< 0.006	0.005	0.031
Arsenic	mg/L	-	-	0.0088	0.00058	0.0005		< 0.0005	< 0.0005	< 0.0005	< 0.0005
Copper	mg/L	-	-	0.0023	0.00084	0.0005		< 0.0005	0.0006	0.0021	< 0.0005
Lead	mg/L	-	-	0.0003	0.00614	0.00123		< 0.0003	< 0.0003	0.001	< 0.0003
Nickel	mg/L	-	-	0.0025	0.00112	0.00058		0.0005	< 0.0005	0.0005	< 0.0005
Zinc	mg/L	-	-	0.001	0.0018	0.00125		< 0.001	< 0.001	< 0.001	< 0.001
Radionuclides											
Radium-226	mg/L	0.002	0.002	0.002	0.0024	0.002		< 0.002	0.003	< 0.002	< 0.002

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.10: Meadowbank 2018 East Dike Discharge (ST-8)

Sample Date		Annual Average														
Parameters	**Units**	**2014**	**2015**	**2016**	**2017**		**1/3/2018**	**2/6/2018**	**2/13/2018**	**3/5/2018**	**4/2/2018**	**5/14/2018**	**8/22/2018**	**9/10/2018**	**10/15/2018**	**11/19/2018**	**12/17/2018**
Field Measured																	
pH	pH units	-	7.37	7.65	7.82		8.53	8.31	7.29	7.39	7.82	7.24	7.69	7.24	7.38	7.35	7.66
Conductivity	uS/cm	-	81.51	83.76	105.05		85.6	87.5	82.7	96.6	107	89.1	106.1	108.9	128.3	76.2	94.1
Temperature	°C	-	12.57	11.70	10.54		0.9	0.5	16	5.6	2.8	7	7.5	8.9	1.9	4.1	5
Turbidity	NTU	8.29	4.88	3.48	6.11		1.9	3.75	2.75	3.07	2.68	4.94	2.41	2.02	1.25	1.69	6.01
Conventional Parameters																	
Total suspended solids	mg/L	8.55	6.77	4.31	10.43		3	4	6	6	12	< 1	< 1	1	5	2	2
Major Ions																	
Cyanide	mg/L	0.005	0.005	0.0048	0.00229		< 0.001	< 0.001	< 0.001	0.002	< 0.001	0.001	0.001	0.001	0.001	< 0.001	< 0.001
Sulphate	mg/L	7.83	21.63	7.97	9.21		6	7.2	6	8.5	8.4	9.7	20.7	19.4	8.9	7.1	7.5
Total Metals																	
Aluminum	mg/L	-	0.0403	0.0473	0.0429		0.055	0.053	0.083	0.058	0.063	0.047	0.019	0.06	< 0.005	0.049	< 0.005
Arsenic	mg/L	-	0.00377	0.00066	0.0011		0.0025	< 0.0005	< 0.0005	< 0.0005	0.0009	0.0044	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Copper	mg/L	-	0.00161	0.0017	0.0012		0.0023	0.001	0.0015	0.0013	0.0023	0.0006	0.0008	< 0.0005	< 0.0005	0.0006	< 0.0005
Lead	mg/L	-	0.00137	0.0003	0.00081		< 0.0003	0.0041	< 0.0003	0.0008	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Nickel	mg/L	-	0.00162	0.0011	0.00069		0.0005	0.0015	0.0007	< 0.0005	0.0014	0.0008	0.0015	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	-	0.0054	0.0043	0.0025		0.005	< 0.001	< 0.001	0.002	0.015	0.003	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Radionuclides																	
Radium-226	Bq/l	0.0033	0.002	0.0023	0.0022		-	< 0.002	-	-	< 0.002	-	0.005	0.006	0.005	-	< 0.002

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.11: Meadowbank 2018 East Dike seepage discharge to pit (ST-S-1)

Parameters	MAX GRAB	MAX MEAN	Sample Date	Annual Average				6/30/2018	7/16/2018	8/6/2018
			Units	2013	2014	2015				
Field Measured										
pH			pH units	-	-	7.07		7.46	7.9	7.36
Conductivity			µs/cm	-	-	116.3		115.4	88.3	111.5
Temperature			°C	-	-	19.6		9.1	11.3	11.6
Turbidity			NTU	6.26	4.35	2.51		8.26	4.06	3.35
Total suspended solids	30	15	mg/L	-	-	-		-	10.7	-
Conventional Parameters										
Hardness			mg CaCO3/L	-	-	40		31	32	34
Total dissolved solids			mg/L	-	-	-		-	49	67
Total suspended solids	30	15	mg/L	-	-	1		-	9	3
Major Ions										
Alkalinity			mg CaCO3/L	-	-	29.5		27	27	39
Chloride			mg/L	0.76	0.86	0.85		1.3	0.9	1.2
Cyanide			mg/L	-	-	-		0.001	0.001	0.002
Fluoride			mg/L	0.092	0.094	0.075		0.11	0.09	0.14
Sulphate			mg/L	4.66	7.99	18.05		8.4	7.1	20.2
Nutrients and Chlorophyll a										
Nitrate			mg/L	0.18	0.22	0.47		0.07	0.11	0.23
Nitrite			mg/L	0.01	0.01	0.01		< 0.01	< 0.01	< 0.01
Ammonia Nitrogen			mg/L	0.049	0.01	0.01		0.01	0.08	< 0.01
Ammonia (NH3)			mg/L	0.055	0.03	0.01		< 0.01	< 0.01	< 0.01
Total Metals										
Aluminum			mg/L	0.24	0.098	0.041		0.095	0.026	0.011
Arsenic			mg/L	0.0037	0.0018	0.0005		0.0007	0.0034	0.009
Barium			mg/L	0.0092	0.0083	0.0083		0.0071	0.0047	0.0103
Cadmium			mg/L	0.00002	0.000036	0.00002		< 0.00002	< 0.00002	< 0.00002
Chromium			mg/L	0.00095	0.0007	0.0011		0.001	0.0007	< 0.0006
Copper			mg/L	0.0037	0.0012	0.00065		0.0012	0.0006	0.0009
Iron			mg/L	0.42	0.15	0.095		0.19	0.07	0.07
Lead			mg/L	0.0022	0.0012	0.0003		< 0.0003	< 0.0003	< 0.0003
Manganese			mg/L	0.010	0.0059	0.014		0.0054	0.0034	0.002
Mercury			mg/L	0.00001	0.000028	0.00001		< 0.00001	< 0.00001	0.00021
Molybdenum			mg/L	0.00052	0.0011	0.00055		< 0.0005	< 0.0005	< 0.0005
Nickel			mg/L	0.0029	0.0012	0.0029		0.0017	0.0012	0.0015
Selenium			mg/L	0.001	0.001	0.001		< 0.001	0.005	< 0.0005
Silver			mg/L	0.00016	0.0001	0.0001		< 0.0001	< 0.0001	< 0.0001
Thallium			mg/L	0.031	0.005	0.005		< 0.0008	< 0.0002	< 0.0002
Zinc			mg/L	0.098	0.003	0.001		< 0.001	0.001	0.002

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.13: Meadowbank 2018 ST-16 Water Quality Monitoring

Sample Date		Annual Average						7/15/2018	8/21/2018	9/5/2018
Parameters	**Units**	**2013**	**2014**	**2015**	**2016**	**2017**				
Field Parameters										
pH	-	-	-	7.37	7.68	-		7.64	7.67	7.31
Conductivity	uS/cm	-	-	378.16	374.7	-		364	382	458
Turbidity	NTU	-	-	55.195	15.00	-		4.23	4.76	3.45
Conventional Parameters										
Hardness	mg CaCO3/L	-	764	143.25	189.25	153.75		128	205	195
Total suspended solids	mg/L	-	19.33	10	8.75	4.25		1	1	1
Total dissolved solids	mg/L	-	-	312.75	290.6	-		206	287	250
Major Ions										
Alkalinity	mg CaCO3/L			61.5	73.6	-		67	80	77
Chloride	mg/L	223.77	500.62	10.3	8.85	9.63		5.3	5.1	5.1
Total Cyanide	mg/L	-	1.38	0.022	0.0033	0.05		0.003	0.002	0.001
Cyanide WAD	mg/L	-	-	-	-	-		0.001	0.001	< 0.001
Free Cyanide	mg/L	-	-	-	-	-		< 0.005	< 0.005	< 0.005
Fluoride	mg/L	0.27	0.33	0.19	0.2	0.23		0.16	0.2	0.2
Nutrients and Chlorophyll a										
Nitrate	mg/L	-	-	7.8375	9.19	-		2.11	5.88	4.62
Nitrite	mg/L	-	-	0.065	0.054	-		0.04	0.03	< 0.01
Ammonia Nitrogen	mg/L	0.14	21.65	1.11	0.28	0.32		0.1	0.07	0.06
Ammonia (NH3)	mg/L	-	-	0.015	0.034	-		< 0.01	<0.01	< 0.01
Total Metals										
Aluminum	mg/L	0.0125	0.16	0.006	0.006	0.006		0.066	< 0.005	0.018
Antimony	mg/L	-	0.00058	0.00025	0.00025	0.00023		0.0002	0.0004	0.0002
Arsenic	mg/L	-	0.0072	0.0027	0.003	0.00058		0.0042	0.0017	0.0012
Barium	mg/L	0.044	0.032	0.024	0.018	0.0163		0.0165	0.0248	0.0156
Beryllium	mg/L	-	0.0005	0.0005	0.0005	0.0005		< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	-	0.083	0.055	0.015	0.013		< 0.01	0.01	0.03
Cadmium	mg/L	-	0.00026	0.00013	0.00004	0.00002		< 0.00002	0.00005	< 0.00002
Chromium	mg/L	-	0.0029	0.0033	0.0006	0.0006		0.0015	< 0.0006	0.0012
Copper	mg/L	-	0.39	0.047	0.026	0.019		0.0197	0.0138	0.0139
Iron	mg/L	-	1.15	1.45	0.60	0.315		0.48	0.4	0.2
Lead	mg/L	-	0.0022	0.0019	0.0003	0.0016		< 0.0003	< 0.0003	< 0.0003
Lithium	mg/L	0.0078	0.0053	0.005	0.005	0.018		< 0.005	< 0.005	< 0.005
Manganese	mg/L	-	1.51	0.73	0.38	0.13		12.5	0.0746	21.5
Mercury	mg/L	-	0.00002	0.000013	0.00023	0.00001		< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	-	0.067	0.015	0.012	0.011		0.013	0.0122	0.0074
Nickel	mg/L	-	0.54	0.051	0.037	0.023		0.0163	0.0172	0.0138
Selenium	mg/L	-	0.028	0.0013	0.001	0.001		< 0.001	0.0007	0.001
Silver	mg/L	-	0.0013	0.0001	0.0001	0.0001		< 0.0001	< 0.0001	< 0.0001
Strontium	mg/L	-	0.4	0.16	0.17	0.157		0.138	0.269	0.201
Thallium	mg/L	-	0.005	0.005	0.0008	0.0008		< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	-	0.0013	0.001	0.001	0.001		< 0.001	< 0.001	< 0.001
Titanium	mg/L	-	0.18	0.038	0.028	0.035		0.03	0.05	0.05
Uranium	mg/L	-	0.069	0.0065	0.0058	0.005		0.005	0.004	0.004
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005		< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	-	0.0054	0.004	0.0025	0.001		0.002	< 0.001	0.001
Dissolved Metals										
Arsenic	mg/L	0.0031	0.0052	0.0005	0.0018	0.00078		< 0.0001	< 0.0005	0.0017
Barium	mg/L	0.062	0.053	0.017	0.018	0.015		0.0133	0.0249	0.0147
Cadmium	mg/L	0.0002	0.0006	0.000033	0.00003	0.00002		< 0.00002	0.00006	< 0.00002
Copper	mg/L	1.03	1.4	0.03	0.021	0.014		0.0146	0.0119	0.0116
Iron	mg/L	1.51	0.56	0.26	0.21	0.14		0.14	0.1	0.05
Lead	mg/L	0.0003	0.00065	0.0003	0.00033	0.0003		< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	3.9	2.62	0.71	0.36	0.11		10.9	0.0747	18.7
Mercury	mg/L	0.0001	0.0001	0.00001	0.00001	0.00001		< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.053	0.099	0.015	0.013	0.0098		0.0118	0.0123	0.0069
Nickel	mg/L	0.57	0.43	0.043	0.035	0.018		0.0143	0.0171	0.0119
Selenium	mg/L	0.0093	0.048	0.001	0.0001	0.001		< 0.001	0.0012	0.0013
Thallium	mg/L	0.005	0.005	0.005	0.0008	0.0008		< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.009	0.0027	0.001	0.001	0.001		< 0.001	< 0.001	< 0.001

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.14: Meadowbank 2018 NP2 South Water Quality Monitoring

		Sample Date	Annual Average						
Parameters	**CCME Aquatic Freshwater**	**Units**	**2014**	**2015**	**2016**	**2017**	**7/15/2018**	**8/20/2018**	**9/5/2018**
Field Measured									
pH		pH units	7.30	7.13	7.28	7.79	7.82	7.67	7.66
Conductivity		uS/cm	317.57	284.5	236	231.4	205	199.4	212
Temperature		°C	6.26	19.08	10.89	11.73	14.9	6.7	7.4
Turbidity		NTU	2.70	3.2	1.40	1.4	1.77	1.34	2.32
Conventional Parameters									
Hardness		mg CaCO3/L	98.5	75	81.5	73.75	63	68	75
Total suspended solids		mg/L	1.88	1	2.75	3.2	2	1	< 1
Total dissolved solids		mg/L	270	183	163	147	104	110	109
Total organic carbon		mg/L	5.7	4.23	4.45	5.86	5.5	4.7	4.6
Dissolved organic carbon		mg/L	5.2	4.37	3.83	5.86	3.4	4.1	4
Major Ions									
Alkalinity		mg CaCO3/L	40	42	47	56	46	56	47
Bicarbonate		mg CaCO3/L	-	-	47	56	46	56	47
Bromide		mg/L	0.1	0.047	0.038	0.056	0.03	0.03	0.02
Carbonate		mg CaCO3/L	-	-	2	2	< 2	< 2	< 2
Chloride	120	mg/L	9.6	6.77	5.13	4.64	3.8	3.8	3.3
Total Cyanide		mg/L	0.021	0.005	5.13	0.0024	< 0.001	< 0.001	< 0.001
Free Cyanide		mg/L	0.0088	0.005	0.005	0.005	< 0.005	< 0.005	< 0.005
Cyanide WAD		mg/L	0.013	0.005	0.003	0.0021	< 0.001	< 0.001	< 0.001
Fluoride		mg/L	0.12	0.11	0.003	0.13	0.1	0.14	0.11
Magnesium		mg/L	7.7	5.73	6.83	6.52	5.28	6.11	6.82
Sulphate		mg/L	121.25	79.83	58.88	44.38	37.8	38.6	41.1
Silica		mg/L	-	-	0.35	0.51	0.45	0.28	0.51
Thiosulfates		mg/L	0.02	0.92	0.02	0.02	< 0.02	< 0.02	< 0.02
Thiocyanates		mg/L	0.05	0.05	0.13	0.11	< 0.05	< 0.05	< 0.05
Nutrients and Chlorophyll a									
Nitrate		mg/L	1.41	1.26	0.28	0.093	0.01	0.03	0.14
Nitrite		mg/L	0.18	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01
Ammonia Nitrogen		mg/L	2.9	0.01	0.03	0.053	< 0.01	0.02	0.05
Ammonia (NH3)		mg/L	0.023	0.01	0.01	0.04	< 0.01	< 0.01	<0.01
Total Kjeldahl nitrogen		mg/L	2.7	0.36	0.49	0.62	0.5	0.2	0.033
Total phosphorus		mg/L	0.0082	0.011	0.0069	2.23	0.0091	0.0036	0.0046
Orthophosphate		mg/L	0.01	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01
Chlorophyll a		ug/L	1.33	2.29	1.77	1.05	1.8	1.4	0.77
Colour		CU	7	7	9	6	7	1	7
Total Metals									
Aluminum		mg/L	0.067	0.006	0.006	0.067	< 0.006	< 0.005	< 0.005
Antimony		mg/L	0.0001	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.005	mg/L	0.00075	0.0034	0.0005	0.0005	< 0.0005	< 0.0005	0.0007
Barium		mg/L	0.015	0.01	0.0069	0.0050	0.0052	0.0044	0.004
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	0.00009	mg/L	0.00002	0.00002	0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002
Calcium		mg/L	-	-	22.17	19.1	16.2	17.7	19
Chromium		mg/L	0.0006	0.0006	0.00093	0.0006	0.0009	< 0.0006	< 0.0006
Cobalt		mg/L	0.0034	0.001	0.0005	0.00063	< 0.0005	< 0.0005	< 0.0005
Copper		mg/L	0.0085	0.0054	0.0050	0.0035	0.0039	0.0026	0.0031
Iron	0.3	mg/L	0.30	0.057	0.083	0.13	0.16	0.07	0.05
Lead		mg/L	0.0008	0.0003	0.0003	0.0008	< 0.0003	0.0019	< 0.0003
Lithium		mg/L	0.005	0.012	0.005	0.005	< 0.005	< 0.005	< 0.005
Magnesium		mg/L	8.23	6.49	6.90	6.57	5.58	5.99	6.72
Manganese		mg/L	0.032	0.010	0.016	0.015	0.0177	0.0055	0.0091
Mercury	0.000026	mg/L	0.00001	0.00001	0.00001	0.00002	< 0.00001	< 0.00001	< 0.00001
Molybdenum	0.073	mg/L	0.0005	0.00053	0.00055	0.00055	< 0.0005	< 0.0005	0.0005
Nickel		mg/L	0.013	0.0052	0.0083	0.0053	0.0041	0.0067	0.0056
Potassium		mg/L	5.17	2.82	3.66	2.33	1.76	1.91	2.09
Selenium	0.001	mg/L	0.0013	0.001	0.001	0.001	< 0.001	0.0009	< 0.0005
Silver	0.0001	mg/L	0.0001	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium		mg/L	-	-	11.7	9.76	6.84	7.04	7.28
Strontium		mg/L	0.11	0.099	0.071	0.083	0.066	0.065	0.072
Tellurium		mg/L	-	-	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005
Thallium	0.0008	mg/L	0.005	0.005	0.0008	0.0008	< 0.0002	< 0.0002	< 0.0002
Tin		mg/L	0.02	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001
Titanium		mg/L	0.02	0.01	0.01	0.018	0.01	0.01	0.02
Uranium		mg/L	0.001	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001
Vanadium		mg/L	0.0005	0.0005	0.00093	0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	0.03	mg/L	0.0013	0.001	0.001	0.0025	< 0.001	< 0.001	< 0.001
Dissolved Metals									
Aluminum		mg/L	0.013	0.006	0.006	0.006	< 0.006	< 0.005	< 0.005
Antimony		mg/L	0.0001	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.005	mg/L	0.00068	0.0018	0.0005	0.0005	< 0.0005	< 0.0005	0.0007
Barium		mg/L	0.015	0.0086	0.0061	0.0044	0.0056	0.0044	0.004
Beryllium		mg/L	0.0005	0.00057	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005
Boron		mg/L	0.017	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01

Cadmium	0.00009	mg/L	0.00013	0.000027	0.00002	0.00002		< 0.00002	< 0.00002	< 0.00002
Chromium		mg/L	0.0006	0.0015	0.00088	0.00076		< 0.0006	< 0.0006	0.001
Cobalt		mg/L	0.0036	0.00097	0.0005	0.00064		< 0.0005	< 0.0005	< 0.0005
Copper		mg/L	0.0069	0.0040	0.0036	0.0027		0.003	0.0025	0.003
Iron	0.3	mg/L	0.018	0.01	0.01	0.03		0.03	< 0.01	0.01
Lead		mg/L	0.0038	0.0003	0.0003	0.00048		< 0.0003	0.0006	< 0.0003
Lithium		mg/L	0.005	0.005	0.005	0.005		< 0.005	< 0.005	< 0.005
Manganese		mg/L	0.04	0.0005	0.0017	0.0046		0.0069	0.0012	0.0091
Mercury	0.000026	mg/L	0.00001	0.00001	0.00001	0.00001		< 0.00001	< 0.00001	< 0.00001
Molybdenum	0.073	mg/L	0.0015	0.00057	0.00055	0.00054		< 0.0005	< 0.0005	< 0.0005
Nickel		mg/L	0.013	0.0046	0.0067	0.0043		0.0038	0.0058	0.0056
Selenium	0.001	mg/L	0.0015	0.001	0.001	0.001		< 0.001	< 0.0005	< 0.0005
Silver	0.0001	mg/L	0.0001	0.0001	0.0001	0.0001		< 0.0001	< 0.0001	< 0.0001
Strontium		mg/L	0.11	0.089	0.068	0.070		0.065	0.065	0.076
Thallium	0.0008	mg/L	0.005	0.005	0.0008	0.0008		< 0.0002	< 0.0002	0.0002
Tin		mg/L	0.003	0.001	0.001	0.001		< 0.001	< 0.001	< 0.001
Titanium		mg/L	0.017	0.01	0.01	0.018		0.01	0.01	0.02
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	0.03	mg/L	0.001	0.001	0.001	0.001		0.002	0.001	< 0.001

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.15: Meadowbank 2018 NP2 West Water Quality Monitoring

		Sample Date	Annual Average					7/15/2018	8/21/2018	9/5/2018
Parameters	**CCME Aquatic**	**Units**	**2014**	**2015**	**2016**	**2017**				
Field Measured										
pH		pH units	7.35	7.28	7.36	7.79		7.74	7.73	7.67
Conductivity		uS/cm	327	279	231.5	232.2		213.00	201.00	216
Temperature		°C	6.48	20.94	16.4	13.23		12.50	7.90	7.20
Turbidity		NTU	7.86	2.72	1.51	1.77		2.79	1.96	1.94
Conventional Parameters										
Turbidity		NTU	-	-	-	-		-	-	0.58
Hardness		mg CaCO3/L	93.67	78.67	80.5	71.25		70	97	78
Total suspended solids		mg/L	7	4	2.75	2.25		2	< 1	1
Total dissolved solids		mg/L	233	182	162	145		104	115	106
Total organic carbon		mg/L	6.13	4.17	4.48	5.98		4.5	4.4	4.3
Dissolved organic carbon		mg/L	6.03	4.4	3.2	5.98		3.7	4.2	4.3
Major Ions										
Alkalinity		mg CaCO3/L	44	40	47	56		47	58	47
Bicarbonate		mg CaCO3/L	-	-	47	56		47	58	47
Bromide		mg/L	0.065	0.047	0.04	0.04		0.04	0.03	0.03
Carbonate		mg CaCO3/L	-	-	2	2		< 2	< 2	< 2
Chloride	120	mg/L	9.15	6.7	4.93	4.45		3.2	3.5	3.7
Total Cyanide		mg/L	0.0075	0.005	0.003	0.0029		< 0.001	< 0.001	< 0.001
Free Cyanide		mg/L	0.0088	0.005	0.005	0.005		< 0.005	-	< 0.005
Cyanide WAD		mg/L	0.0095	0.005	0.003	0.003		< 0.001	< 0.001	< 0.001
Fluoride		mg/L	0.12	0.11	0.11	0.13		0.1	0.14	0.12
Magnesium		mg/L	7.8	5.88	6.76	6.32		5.89	6.41	7.13
Sulphate		mg/L	102.23	77.27	58.63	45.88		38.5	40.4	41.3
Silica		mg/L	-	-	0.5	0.57		0.71	0.62	0.51
Thiosulfates		mg/L	0.02	0.02	0.02	0.02		< 0.02	< 0.02	< 0.02
Thiocyanates		mg/L	1.28	0.05	0.05	0.1		< 0.05	< 0.05	< 0.05
Nutrients and Chlorophyll a										
Nitrate		mg/L	1.25	1.29	0.3	0.12		0.07	0.12	0.08
Nitrite		mg/L	0.12	0.01	0.01	0.01		< 0.01	0.01	< 0.01
Ammonia Nitrogen		mg/L	3.19	0.01	0.073	0.053		0.02	0.01	0.06
Ammonia (NH3)		mg/L	0.027	0.01	0.01	0.04		< 0.01	< 0.01	< 0.01
Total Kjeldahl nitrogen		mg/L	3.85	0.64	0.45	0.63		0.46	0.16	0.50
Total phosphorus		mg/L	0.021	0.0087	0.0061	1.55		0.0057	0.0031	0.0042
Orthophosphate		mg/L	0.023	0.01	0.01	0.01		< 0.01	< 0.01	< 0.01
Colour		CU	10	7	10	4		4	17	5
Chlorophyll a		ug/L	0.85	1.71	2.28	1.73		2.6	-	0.90
Total Metals										
Aluminum		mg/L	0.25	0.006	0.031	0.03		0.026	< 0.005	< 0.005
Antimony		mg/L	0.0001	0.0001	0.0001	0.0001		< 0.0001	< 0.0001	< 0.0001
Arsenic	0.005	mg/L	0.0033	0.0037	0.0005	0.0005		< 0.0005	< 0.0005	< 0.0005
Barium		mg/L	0.015	0.01	0.0051	0.0054		0.005	0.0068	0.0042
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	0.00009	mg/L	0.000025	0.00002	0.00002	0.00002		< 0.00002	< 0.00002	< 0.00002
Calcium		mg/L	-	-	21.47	18.5		18.6	25.2	19.9
Chromium		mg/L	0.0006	0.0006	0.00068	0.0006		0.001	< 0.0006	0.0007
Cobalt		mg/L	0.0036	0.001	0.0005	0.0005		< 0.0005	< 0.0005	< 0.0005
Copper		mg/L	0.011	0.0053	0.0034	0.0028		0.0033	0.0039	0.0027
Iron	0.3	mg/L	0.33	0.05	0.095	0.06		0.11	0.04	0.04
Lead		mg/L	0.013	0.0097	0.0003	0.0003		< 0.0003	< 0.0003	< 0.0003
Lithium		mg/L	0.005	0.005	0.005	0.005		< 0.005	< 0.005	< 0.005
Magnesium		mg/L	7.8	6.85	6.78	6.28		5.91	8.44	6.96
Manganese		mg/L	0.068	0.012	0.018	0.0099		0.0151	0.0063	0.0048
Mercury	0.000026	mg/L	0.00001	0.00001	0.00001	0.00001		< 0.00001	< 0.00001	< 0.00001
Molybdenum	0.073	mg/L	0.0014	0.00053	0.0005	0.00085		< 0.0005	0.0007	0.0006
Nickel		mg/L	0.014	0.0052	0.0074	0.0042		0.0055	0.0088	0.0060
Potassium		mg/L	4.1	2.88	2.75	2.23		1.99	2.39	2.11
Selenium	0.001	mg/L	0.001	0.001	0.001	0.001		< 0.001	< 0.0005	< 0.0005
Silver	0.0001	mg/L	0.0001	0.00001	0.0001	0.0001		< 0.0001	< 0.0001	< 0.0001
Sodium		mg/L	-	-	10.86	7.77		7.18	8.39	7.51
Strontium		mg/L	0.11	0.090	0.073	0.076		0.071	0.066	0.072
Tellurium		mg/L	-	-	0.0005	0.0005		< 0.0005	< 0.0005	< 0.0005
Thallium	0.0008	mg/L	0.005	0.005	0.0008	0.0008		< 0.0002	< 0.0002	< 0.00002
Tin		mg/L	0.001	0.001	0.001	0.001		< 0.001	< 0.001	< 0.001
Titanium		mg/L	0.025	0.01	0.01	0.018		0.02	0.02	0.02
Uranium		mg/L	0.002	0.001	0.001	0.001		0.001	0.001	0.001
Vanadium		mg/L	0.0005	0.0005	0.00053	0.0005		< 0.0005	< 0.0005	< 0.0005
Zinc	0.03	mg/L	0.0027	0.001	0.038	0.001		0.001	< 0.001	< 0.001
Dissolved Metals										
Aluminum		mg/L	0.011	0.006	0.006	0.006		< 0.006	< 0.005	0.055
Antimony		mg/L	0.0001	0.0001	0.0001	0.0001		< 0.0001	< 0.0001	< 0.0001
Arsenic	0.005	mg/L	0.0028	0.0031	0.0005	0.0005		< 0.0005	< 0.0005	< 0.0005
Barium		mg/L	0.015	0.009	0.0065	0.0046		0.0039	0.004	0.0046
Beryllium		mg/L	0.0005	0.00057	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	0.00009	mg/L	0.000035	0.000037	0.00002	0.00002		< 0.00002	< 0.00002	< 0.00002
Chromium		mg/L	0.0006	0.0018	0.00093	0.00068		< 0.0006	< 0.0006	0.0012
Cobalt		mg/L	0.0031	0.0009	0.0005	0.0005		< 0.0005	< 0.0005	< 0.0005
Copper		mg/L	0.0087	0.0041	0.0036	0.0023		0.0031	0.0025	0.0028
Iron	0.3	mg/L	0.02	0.01	0.01	0.028		0.02	< 0.01	< 0.01
Lead		mg/L	0.0038	0.0003	0.0003	0.0003		0.0041	< 0.0003	< 0.0003
Lithium		mg/L	0.005	0.005	0.005	0.005		< 0.005	< 0.005	< 0.005
Manganese		mg/L	0.051	0.0005	0.0040	0.0075		0.0058	0.0007	0.0016
Mercury	0.000026	mg/L	0.0001	0.00001	0.00001	0.00002		< 0.00001	< 0.00001	< 0.00001

Molybdenum	0.073	mg/L	0.0011	0.0006	0.0005	0.00058		< 0.0005	< 0.0005	0.0006
Nickel		mg/L	0.012	0.0047	0.0065	0.0035		0.0038	0.0057	0.0063
Selenium	0.001	mg/L	0.001	0.001	0.001	0.001		< 0.001	< 0.0005	< 0.0005
Silver	0.0001	mg/L	0.0001	0.0001	0.0003	0.0001		< 0.0001	< 0.0001	< 0.0001
Strontium		mg/L	0.10	0.091	0.069	0.069		0.067	0.070	0.081
Thallium	0.0008	mg/L	0.005	0.005	0.0008	0.0008		< 0.0008	< 0.0002	0.0002
Tin		mg/L	0.001	0.001	0.001	0.001		< 0.001	< 0.001	< 0.001
Titanium		mg/L	0.013	0.01	0.01	0.018		0.01	0.01	0.02
Uranium		mg/L	0.002	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	0.03	mg/L	0.001	0.001	0.001	0.001		< 0.001	< 0.001	< 0.001

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.16: Meadowbank 2018 NP2 East Water Quality Monitoring

		Sample Date	Annual Average							
Parameters	**CCME Aquatic Freshwater**	**Units**	**2014**	**2015**	**2016**	**2017**		**7/11/2018**	**8/21/2018**	**9/5/2018**
Field Measured										
pH		pH units	7.42	7.63	7.38	7.66		7.17	7.64	7.74
Conductivity		uS/cm	342.25	283.67	227.25	261.5		211	200	213
Temperature		°C	6.81	-	17	14.28		14.4	7.6	6.7
Turbidity		NTU	3.07	4.48	2.93	1.58		3.62	1.63	2
Conventional Parameters										
pH		pH units	-	-	-	-		-	7.92	-
Conductivity		umhos/cm	-	-	-	-		-	171	-
Dissolved Oxygen		mg/L	-	-	-	-		-	10.21	-
Turbidity		NTU	-	-	-	-		-	0.91	-
Hardness		mg CaCO3/L	96.75	81	81.5	76.25		60	84	70
Total suspended solids		mg/L	2.67	105	3.25	1.75		1	1	1
Total dissolved solids		mg/L	246	182	162	145.5		106	114	106
Total organic carbon		mg/L	5.9	4.2	4.78	6.03		4.2	4.7	4.4
Dissolved organic carbon		mg/L	5.67	4.23	3.63	6		4.2	4.1	4
Major Ions										
Alkalinity		mg CaCO3/L	39.8	38	46	55.5		48	56	47
Bicarbonate		mg CaCO3/L	-	-	46	55.5		48	56	47
Bromide		mg/L	0.10	0.057	0.023	0.033		0.05	0.03	0.03
Carbonate		mg CaCO3/L	-	-	2	2		< 2	< 2	< 2
Chloride	120	mg/L	9.43	6.6	5.4	4.35		3.8	3.7	3.7
Total Cyanide		mg/L	0.0066	0.005	0.003	0.0048		< 0.001	< 0.001	< 0.001
Free Cyanide		mg/L	0.0088	0.005	0.005	0.005		0.038	< 0.005	< 0.005
Cyanide WAD		mg/L	0.006	0.005	0.003	0.0033		< 0.001	< 0.001	< 0.001
Fluoride		mg/L	0.12	0.083	0.12	0.13		0.08	0.14	0.12
Magnesium		mg/L	7.47	5.91	6.86	6.37		5.77	6.15	6.47
Sulphate		mg/L	113.5	75.4	61.2	44.4		33.8	39.2	40.3
Silica		mg/L	-	-	0.43	0.58		0.87	0.290	0.45
Thiosulfates		mg/L	0.02	2.29	0.02	0.02		< 0.02	< 0.02	< 0.02
Thiocyanates		mg/L	0.14	0.05	0.37	0.095		< 0.05	< 0.05	< 0.05
Nutrients and Chlorophyll a										
Nitrate		mg/L	1.38	1.30	8.20	0.09		0.03	0.03	0.06
Nitrite		mg/L	0.15	0.01	0.01	0.01		< 0.01	0.01	< 0.01
Ammonia Nitrogen		mg/L	2.93	0.03	0.033	0.05		0.01	0.01	0.03
Ammonia (NH3)		mg/L	2.93	0.03	0.033	0.05		0.01	< 0.01	0.03
Total Kjeldahl nitrogen		mg/L	4.33	0.34	7.51	0.63		0.27	0.08	0.35
Total phosphorus		mg/L	0.011	0.0087	1.18	1.75		0.012	0.0032	0.004
Orthophosphate		mg/L	0.013	0.01	0.01	0.01		0.03	< 0.01	< 0.01
Chlorophyll a		ug/L	0.00076	0.0013	0.0030	0.0018		2.2	1.6	0.96
Colour		CU	5.67	5.33	6.25	4.5		6	18	5
Total Metals										
Aluminum		mg/L	0.094	0.012	0.031	0.018		< 0.006	< 0.005	0.006
Antimony		mg/L	0.0001	0.0001	0.0001	0.0001		< 0.0001	< 0.0001	< 0.0001
Arsenic	0.005	mg/L	0.00085	0.0035	0.0005	0.0005		< 0.0005	< 0.0005	< 0.0005
Barium		mg/L	0.014	0.011	0.0051	0.0056		0.0056	0.0045	0.0042
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	0.00009	mg/L	0.00002	0.00002	0.00002	0.00002		< 0.00002	< 0.00002	< 0.00002
Calcium		mg/L	-	-	21.9	19.65		15.3	21.7	17.8
Chromium		mg/L	0.0006	0.0031	0.00085	0.0006		< 0.0006	< 0.0006	< 0.0006
Cobalt		mg/L	0.0031	0.0012	0.0005	0.0005		< 0.0005	< 0.0005	< 0.0005
Copper		mg/L	0.0076	0.0058	0.0031	0.0027		0.0017	0.0029	0.0026
Iron	0.3	mg/L	0.16	0.08	0.093	0.088		0.1	0.05	0.04
Lead		mg/L	0.0017	0.0003	0.00038	0.0085		< 0.0003	< 0.0003	< 0.0003
Lithium		mg/L	0.005	0.005	0.005	0.005		< 0.005	< 0.005	< 0.005
Magnesium		mg/L	8.03	6.91	5.06	6.78		5.5	7.30	6.32
Manganese		mg/L	0.029	0.016	0.012	0.014		0.016	0.0045	0.0035
Mercury	0.000026	mg/L	0.00001	0.000013	0.00001	0.00001		< 0.00001	< 0.00001	< 0.00001
Molybdenum	0.073	mg/L	0.00057	0.00053	0.0005	0.00053		< 0.0005	< 0.0005	0.0005
Nickel		mg/L	0.013	0.0095	0.0056	0.0047		0.0056	0.0064	0.0053
Potassium		mg/L	4.8	2.93	2.00	2.36		1.08	2.16	2.01
Selenium	0.001	mg/L	0.001	0.001	0.001	0.001		< 0.001	< 0.0005	< 0.0005
Silver	0.0001	mg/L	0.0001	0.0001	0.00013	0.0001		< 0.0001	< 0.0001	< 0.0001
Sodium		mg/L	-	-	12.3	9.39		6.28	7.75	6.82
Strontium		mg/L	0.11	0.09	0.076	0.074		0.081	0.065	0.069
Tellurium		mg/L	-	-	0.0005	0.0005		0.0011	< 0.0005	-
Thallium	0.0008	mg/L	0.005	0.005	0.0008	0.0008		< 0.0008	< 0.0002	< 0.0002
Tin		mg/L	0.001	0.001	0.001	0.001		< 0.001	< 0.001	< 0.001
Titanium		mg/L	0.017	0.017	0.013	0.018		0.01	0.02	0.02
Uranium		mg/L	0.001	0.001	0.001	0.001		0.001	0.001	0.001
Vanadium		mg/L	0.0005	0.0005	0.00068	0.0005		< 0.0005	< 0.0005	< 0.0005
Zinc	0.03	mg/L	0.0013	0.001	0.001	0.0018		< 0.001	< 0.001	< 0.001
Dissolved Metals										
Aluminum		mg/L	0.007	0.006	0.006	0.006		< 0.006	< 0.005	< 0.005
Antimony		mg/L	0.0001	0.0001	0.0001	0.0001		< 0.0001	< 0.0001	< 0.0001
Arsenic	0.005	mg/L	0.00097	0.0005	0.0005	0.0006		< 0.0005	< 0.0005	< 0.0005
Barium		mg/L	0.014	0.010	0.0058	0.0047		0.0044	0.0038	0.004
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	0.00009	mg/L	0.00002	0.00002	0.00002	0.00002		< 0.00002	< 0.00002	< 0.00002

Chromium		mg/L	0.0006	0.0006	0.00068	0.0011		< 0.0006	< 0.0006	0.0011
Cobalt		mg/L	0.0034	0.00097	0.0005	0.00075		< 0.0005	< 0.0005	< 0.0005
Copper		mg/L	0.0062	0.0043	0.0029	0.0024		0.0014	0.0021	0.0026
Iron	0.3	mg/L	0.012	0.01	0.01	0.013		0.01	< 0.01	< 0.01
Lead		mg/L	0.0065	0.0003	0.0003	0.044		< 0.0003	< 0.0003	< 0.0003
Lithium		mg/L	0.005	0.005	0.005	0.005		< 0.005	< 0.005	< 0.005
Manganese		mg/L	0.040	0.0060	0.0049	0.00063		< 0.0005	0.0006	0.0011
Mercury	0.000026	mg/L	0.0001	0.00001	0.00001	0.00001		< 0.00001	< 0.00001	< 0.00001
Molybdenum	0.073	mg/L	0.00066	0.0007	0.0005	0.00055		< 0.0005	< 0.0005	0.0005
Nickel		mg/L	0.012	0.0077	0.0062	0.0042		0.0051	0.0072	0.0064
Selenium	0.001	mg/L	0.001	0.001	0.001	0.001		< 0.001	<0.0005	< 0.001
Silver	0.0001	mg/L	0.0001	0.0001	0.0001	0.0001		< 0.0001	< 0.0001	< 0.0001
Strontium		mg/L	0.10	0.089	0.079	0.071		0.085	0.067	0.072
Thallium	0.0008	mg/L	0.005	0.005	0.0008	0.0008		< 0.0008	< 0.0002	< 0.0002
Tin		mg/L	0.001	0.001	0.001	0.001		< 0.001	< 0.001	< 0.001
Titanium		mg/L	0.013	0.01	0.01	0.015		0.02	0.01	0.02
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	0.03	mg/L	0.001	0.001	0.001	0.001		< 0.001	< 0.001	< 0.001

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.17: Meadowbank 2018 NP2 Winter Water Quality Monitoring

Parameters	CCME Aquatic Freshwater	Units	Annual Average				1/22/2018	2/19/2018	3/11/2018	5/6/2018	11/19/2018	12/17/2018
		Sample Date	2014	2015	2016	2017						
Field Measured												
pH		pH units	6.37	6.73	7.15	7.34	7.14	7.16	7.79	7.46	7.44	-
Conductivity		us/cm	460.33	355.5	414.33	352.8	349	397	382	447	231.6	-
Temperature		°C	2	-	4.2	4.55	1.43	1.4	-	0.2	2.98	-
Dissolved oxygen		mg/L	-	10.4	9.14	10.26	12.82	13	9	8.22	13.22	-
Turbidity		NTU	4.96	0.22	1.12	1.26	1.18	1.16	0.61	1	-	2.33
Conventional Parameters												
pH		pH units	-	7.4	7.10	7.17	-	-	-	7.34	-	-
Specific conductivity		us/cm	-	314	332.5	348.5	-	-	-	1	-	-
Hardness		mg CaCO3/L	88.5	91	132.33	127	126	139	144	160	84	90
Total dissolved solids		mg/L	346	217.5	263.33	232	235	252	255	173	120	134
Total suspended solids		mg/L	2	2.5	2.5	4	< 1	< 1	< 1	< 1	1	< 1
Total organic carbon		mg/L	5.95	7.15	7.47	7.47	8.1	8.4	8.7	9.4	4.3	4.8
Dissolved organic carbon		mg/L	6.3	6.65	5.18	15.49	7.5	8.4	8.3	11.7	3.8	4.8
Colour		TCU	6	5	4.83	4.57	2	4	3	4	2	2
Major Ions												
Alkalinity		mg CaCO3/L	50.1	52	62.2	79.7	91	90	100	106	63	64
Bicarbonate		mg CaCO3/L	-	-	62.2	79.7	91	90	100	106	63	64
Bromide		mg/L	0.18	0.09	0.11	0.089	0.08	0.11	0.11	0.03	0.04	0.21
Carbonate		mg CaCO3/L	-	-	2	2	< 2	< 2	< 2	< 2	< 2	< 2
Chloride	120	mg/L	16.55	6.4	9.43	7.66	8	8.3	9.8	8.4	4.3	5.1
Total Cyanide		mg/L	0.016	0.005	0.0043	0.0089	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Free Cyanide		mg/L	0.011	0.005	0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Cyanide WAD		mg/L	0.025	0.005	0.0043	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Fluoride		mg/L	0.11	0.14	0.16	0.17	0.16	0.23	0.27	0.21	0.12	0.13
Magnesium		mg/L	11.4	7.97	11.00	9.48	11.2	12.6	11.76	13.9	7.38	7.79
Sulphate		mg/L	161.5	86.55	104.6	77.61	90.3	77.1	87	93.4	46.3	55.1
Silica		mg/L	-	-	0.6	1.49	0.81	1.1	1.4	2.33	0.37	0.65
Nutrients and Chlorophyll a												
Nitrate	3	mg/L	2.63	1.13	1.20	0.55	0.15	0.17	0.17	0.19	0.05	0.07
Nitrite	0.06	mg/L	0.14	0.01	0.015	0.011	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01
Ammonia Nitrogen		mg/L	3.82	0.05	0.135	0.08	0.06	0.06	0.05	0.05	0.02	0.03
Total Kjeldahl nitrogen		mg/L	1.5	0.42	0.54	0.61	0.46	0.39	0.27	0.37	0.21	0.37
Ammonia (NH3)		mg/L	0.01	0.01	0.01	0.021	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total phosphorus		mg/L	0.01	0.01	3.05	1.85	3.8	11	3.8	< 1.9	0.02	0.02
Orthophosphate		mg/L	0.01	0.01	0.01	0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01
Chlorophyll a		mg/L	0.00019	0.00051	0.00046	0.00062	0.00056	-	0.00087	0.00027	0.0013	-
Total Metals												
Aluminum		mg/L	0.059	0.009	0.0077	0.0087	0.014	0.007	< 0.006	< 0.006	< 0.005	< 0.005
Antimony		mg/L	0.00055	0.00015	0.00047	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	**0.005**	mg/L	0.00075	0.012	0.0024	0.0015	0.0257	0.0019	0.0008	< 0.0005	< 0.0005	< 0.0005
Barium		mg/L	0.018	0.013	0.018	0.013	0.0104	0.0132	0.0174	0.0199	0.0034	0.0074
Beryllium		mg/L	0.0013	0.0022	0.0005	0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron		mg/L	0.03	0.01	0.01	0.019	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	0.00009	mg/L	0.00002	0.000035	0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Calcium		mg/L	-	-	23.6	32.09	32.1	34.9	37.8	41.5	20.2	24.2
Chromium		mg/L	0.0028	0.0014	0.0013	0.00094	< 0.0006	0.0015	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Cobalt		mg/L	0.0062	0.0008	0.0027	0.0005	0.0021	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Copper		mg/L	0.023	0.0058	0.0062	0.0043	0.0023	0.0041	0.0041	0.0044	0.0031	0.0024
Iron	0.3	mg/L	0.16	0.03	0.033	0.05	0.016	0.03	0.019	0.03	0.01	< 0.01
Lead		mg/L	0.00058	0.0003	0.00053	0.00046	< 0.0003	< 0.0003	0.0023	< 0.0003	0.0009	< 0.0003
Lithium		mg/L	0.028	0.005	0.0005	0.012	< 0.005	0.043	< 0.005	< 0.005	< 0.005	< 0.005
Magnesium		mg/L	10.9	7.54	11.38	11.52	11.2	12.6	12	13.9	8.25	8.28
Manganese		mg/L	0.11	0.0083	0.021	0.019	0.0063	0.0068	0.006	0.008	0.0031	< 0.0005
Mercury	**0.000026**	mg/L	0.000065	0.00001	0.000017	0.00001	< 0.00001	0.00001	< 0.00001	< 0.00001	0.00016	< 0.00001
Molybdenum	0.073	mg/L	0.0012	0.0005	0.00055	0.0005	< 0.0005	0.001	0.0008	< 0.0005	0.0005	< 0.0005
Nickel		mg/L	0.024	0.0063	0.010	0.0092	0.008	0.009	0.009	0.01	0.0074	0.0064
Potassium		mg/L	6.1	4.06	4.63	3.78	3.79	3.81	4.04	3.9	2.22	2.37
Selenium	0.001	mg/L	0.00065	0.002	0.001	0.0011	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005
Silver	0.0001	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	-	-	12.4	16.33	14.4	16	15.1	19.1	7.91	8.35
Strontium		mg/L	0.16	0.11	0.13	0.13	0.144	0.119	0.154	0.145	0.092	0.101
Tellurium		mg/L	-	-	0.0005	0.0005	-	-	< 0.0005	< 0.0005	-	-
Thallium	0.0008	mg/L	0.0013	0.005	0.0018	0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0002	< 0.0002
Tin		mg/L	0.0036	0.015	0.001	0.008	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium		mg/L	0.011	0.015	0.024	0.026	0.03	0.04	< 0.01	0.04	0.02	< 0.01
Uranium		mg/L	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.001
Vanadium		mg/L	0.0013	0.0005	0.0005	0.0005	0.0031	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	0.03	mg/L	0.27	0.001	0.0012	0.0016	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001
Dissolved Metals												
Aluminum		mg/L	0.018	0.006	0.017	0.011	0.029	0.007	< 0.006	< 0.006	< 0.005	< 0.0005
Antimony		mg/L	0.0001	0.0001	0.0001	0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001
Arsenic	0.005	mg/L	0.00075	0.0005	0.00072	0.00071	< 0.0005	0.0019	0.0008	< 0.0005	< 0.0005	< 0.0005
Barium		mg/L	0.021	0.013	0.017	0.013	0.0093	0.013	0.0135	0.0194	0.0042	0.0034
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	**0.00009**	mg/L	0.00051	0.00002	0.00002	0.000021	< 0.00002	< 0.00002	0.00012	< 0.00002	< 0.00002	< 0.00002
Chromium		mg/L	0.0006	0.0006	0.0008	0.0013	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Cobalt		mg/L	0.0025	0.00085	0.000097	0.00084	0.0016	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Copper		mg/L	0.0082	0.0043	0.0055	0.0044	0.002	0.0039	0.0035	0.0034	0.0029	0.0016
Iron	0.3	mg/L	0.01	0.01	0.01	0.013	< 0.010	0.03	< 0.010	< 0.01	< 0.01	< 0.01
Lead		mg/L	0.00065	0.0003	0.0003	0.0012	< 0.0003	< 0.0003	0.0011	< 0.0003	< 0.0003	< 0.0003
Lithium		mg/L	0.005	0.005	0.005	0.011	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Manganese		mg/L	0.090	0.0005	0.00075	0.00064	0.0013	0.0067	< 0.0005	< 0.0005	0.0005	< 0.0005
Mercury	**0.000026**	mg/L	0.00009	0.00001	0.00001	0.00001	0.00008	0.00003	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	0.073	mg/L	0.0053	0.0006	0.00052	0.0005	< 0.0005	0.001	0.0006	< 0.0005	0.0006	< 0.0005
Nickel		mg/L	0.021	0.0067	0.010	0.0086	0.0084	0.0087	0.009	0.0091	0.0076	0.0059
Selenium	0.001	mg/L	0.001	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005
Silver	0.0001	mg/L	0.0002	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium		mg/L	0.15	0.11	0.12	0.62	0.125	0.115	0.158	0.195	0.1	0.093
Thallium	0.0008	mg/L	0.005	0.005	0.0018	0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 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	0.02	-	0.02	0.023	0.04	0.04	< 0.01	0.04	0.02	< 0.01
Uranium		mg/L	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.001
Vanadium		mg/L	0.0005	0.0005	0.00057	0.0005	0.0021	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	0.03	mg/L	0.001	0.001	0.0012	0.001	< 0.001	< 0.001	0.004	< 0.001	< 0.001	< 0.001

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.18: Meadowbank 2018 NP1 West Water Quality Monitoring

		Sample Date	Annual Average						
Parameters	**CCME Aquatic Freshwater**	**Units**	**2014**	**2015**	**2016**	**2017**	**7/15/2018**	**8/21/2018**	**9/5/2018**
Field Measured									
pH		pH units	7.29	7.54	7.44	7.79	7.56	7.84	7.12
Conductivity		uS/cm	251	273.67	133.9	209.33	223	239	259
Temperature		°C	5.41	15.08	13.77	14.88	12.9	7.3	11
Turbidity		NTU	1.95	1.20	2.16	2.12	1.93	1.44	2.21
Conventional Parameters									
Hardness		mg CaCO3/L	89.33	80	68.5	77.75	64	119	117
Total suspended solids		mg/L	13.25	2	1	3.75	3	1	< 1
Total dissolved solids		mg/L	172.67	163.33	121	140.8	108	132	130
Total organic carbon		mg/L	5.23	4.17	4.08	5.53	4.5	4.9	3.8
Dissolved organic carbon		mg/L	4.87	3.8	3.18	5.48	3.3	4	3.7
Major Ions									
Alkalinity		mg CaCO3/L	43.33	46	39	62.6	50	67	56
Bicarbonate		mg CaCO3/L	-	-	86.25	60.50	50	67	56
Bromide		mg/L	0.11	0.08	0.065	0.04	0.04	0.06	0.06
Carbonate,		mg CaCO3/L	-	-	2	2	< 2	< 2	< 2
Chloride	120	mg/L	10.87	10.97	9.18	9.18	5.2	8	7.6
Total Cyanide		mg/L	0.005	0.005	0.003	0.0025	< 0.001	< 0.001	< 0.001
Free Cyanide		mg/L	0.0083	0.005	0.005	0.005	< 0.005	< 0.005	< 0.005
Cyanide WAD		mg/L	0.0053	0.005	0.003	0.0034	< 0.001	< 0.001	< 0.001
Fluoride		mg/L	0.17	0.14	0.13	0.17	0.12	0.19	0.17
Magnesium		mg/L	7.3	5.72	3.27	7.32	4.79	7.97	8.63
Sulphate		mg/L	60.07	48.33	36.03	30.78	34.4	44.5	44.7
Silica		mg/L	-	-	0.78	0.40	0.53	0.29	0.64
Thiosulfates		mg/L	0.02	0.02	0.02	0.02	< 0.02	< 0.02	< 0.02
Thiocyanates		mg/L	0.05	0.05	0.05	0.088	< 0.05	< 0.05	< 0.05
Nutrients and Chlorophyll a									
Ammonia Nitrogen		mg/L	0.22	0.01	0.045	0.078	0.03	0.02	0.04
Ammonia (NH3)		mg/L	0.01	0.01	0.01	0.042	< 0.01	< 0.01	< 0.01
Total Kjeldahl nitrogen		mg/L	2.22	0.76	0.33	0.63	0.67	0.29	0.3
Total phosphorus		mg/L	0.017	0.01	0.005	1.45	0.0048	0.0023	0.0042
Chlorophyll a		mg/L	0.0004	0.00037	0.0012	0.0012	1.6	-	-
Total Metals									
Aluminum		mg/L	0.088	0.020	0.019	0.0306	< 0.006	< 0.005	0.018
Antimony		mg/L	0.00013	0.00017	0.0001	0.00015	0.0001	0.0001	0.0002
Arsenic	0.005	mg/L	0.0005	0.00087	0.0017	0.0005	< 0.0005	< 0.0005	0.0005
Barium		mg/L	0.012	0.0091	0.0050	0.0059	0.0068	0.0086	0.0107
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	0.00009	mg/L	0.00002	0.00002	0.000055	0.00002	< 0.00002	< 0.00002	< 0.00002
Calcium		mg/L	-	-	-	21.04	17.1	30.6	30.1
Chromium		mg/L	0.0006	0.0012	0.00095	0.00083	< 0.0006	< 0.0006	0.0008
Cobalt		mg/L	0.0011	0.00053	0.0005	0.00088	< 0.0005	< 0.0005	< 0.0005
Copper		mg/L	0.0021	0.0016	0.0027	0.0017	0.0013	0.0018	0.0022
Iron	0.3	mg/L	0.12	0.073	0.078	0.095	0.07	0.03	0.03
Lead		mg/L	0.0005	0.0003	0.0003	0.00088	< 0.0003	< 0.0003	< 0.0003
Lithium		mg/L	0.005	0.014	0.005	0.005	< 0.005	< 0.005	< 0.005
Magnesium		mg/L	7.87	7.03	5.56	6.91	5.41	10.5	10.4
Manganese		mg/L	0.0075	0.0049	0.0096	0.011	0.0104	0.002	0.0029
Mercury	0.000026	mg/L	0.00001	0.00001	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	0.073	mg/L	0.0014	0.0019	0.00073	0.0018	0.0017	0.0026	0.0027
Nickel		mg/L	0.0043	0.0018	0.0047	0.0034	0.003	0.0034	0.0055
Potassium		mg/L	3.23	2.51	2.22	2.40	1.94	2.99	3.16
Selenium	0.001	mg/L	0.001	0.001	0.001	0.001	< 0.001	< 0.0005	< 0.0005
Silver	0.0001	mg/L	0.0001	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium		mg/L	-	-	8.07	6.56	5.3	8.31	7.84
Strontium		mg/L	0.005	0.098	0.054	0.061	0.079	0.091	0.122
Tellurium		mg/L	-	-	0.0005	0.0005	< 0.0005	-	-
Thallium	0.0008	mg/L	0.005	0.005	0.0008	0.0008	< 0.0002	< 0.0002	< 0.0002
Tin		mg/L	0.01	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001
Titanium		mg/L	0.01	0.013	0.013	0.018	0.01	0.03	0.03
Uranium		mg/L	0.001	0.001	0.0013	0.0013	0.001	0.002	0.003
Vanadium		mg/L	0.0005	0.0005	0.0005	0.0006	< 0.0005	< 0.0005	< 0.0005
Zinc	0.03	mg/L	0.002	0.001	0.0013	0.0018	0.001	< 0.001	0.003
Dissolved Metals									
Aluminum		mg/L	0.02	0.006	0.006	0.0068	< 0.006	< 0.005	< 0.005
Antimony		mg/L	0.0001	0.00013	0.00013	0.00025	< 0.0001	0.0001	< 0.0001
Arsenic	0.005	mg/L	0.0005	0.0043	0.0005	0.0005	< 0.0005	< 0.0005	0.0025
Barium		mg/L	0.011	0.0080	0.0048	0.0047	0.0057	0.0066	0.007
Beryllium		mg/L	0.0005	0.0006	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	0.00009	mg/L	0.00002	0.000043	0.000033	0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium		mg/L	0.0006	0.002	0.0011	0.0007	< 0.0006	< 0.0006	0.0008
Cobalt		mg/L	0.0011	0.00053	0.0005	0.00088	< 0.0005	< 0.0005	< 0.0005
Copper		mg/L	0.0018	0.0010	0.00085	0.0008	0.0022	0.0009	0.002
Iron	0.3	mg/L	0.013	0.01	0.01	0.01	0.01	< 0.01	< 0.01
Lead		mg/L	0.0084	0.0003	0.0003	0.00035	0.0004	< 0.0003	< 0.0003
Lithium		mg/L	0.005	0.005	0.005	0.005	< 0.005	< 0.005	< 0.005

Manganese		mg/L	0.0044	0.0016	0.0010	0.0010		< 0.0005	< 0.0005	0.002
Mercury	0.000026	mg/L	0.00001	0.00001	0.00001	0.00001		< 0.00001	< 0.00001	< 0.00001
Molybdenum	0.073	mg/L	0.0017	0.0018	0.0011	0.0020		< 0.0005	0.0017	0.0023
Nickel		mg/L	0.0042	0.0018	0.0027	0.0022		0.0023	0.0024	0.0091
Selenium	0.001	mg/L	0.001	0.001	0.001	0.0013		< 0.001	< 0.0005	0.0005
Silver	0.0001	mg/L	0.0001	0.0001	0.0001	0.0001		< 0.0001	< 0.0001	< 0.0001
Strontium		mg/L	0.098	0.11	0.058	0.084		0.085	0.096	0.111
Thallium	0.0008	mg/L	0.005	0.005	0.0008	0.0008		< 0.0002	< 0.0002	0.0003
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	0.018		0.01	0.02	0.02
Uranium		mg/L	0.001	0.0013	0.0013	0.0015		< 0.001	0.001	0.002
Vanadium		mg/L	0.0005	0.0005	0.0005	0.0005		< 0.0005	< 0.0005	< 0.0005
Zinc	0.03	mg/L	0.0013	0.001	0.001	0.001		0.004	< 0.001	< 0.001

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.19: Meadowbank 2018 Dogleg Water Quality Monitoring

		Sample Date	Annual Average				7/15/2018	8/21/2018	9/5/2018
Parameters	**CCME Aquatic**	**Units**	**2014**	**2015**	**2016**	**2017**			
Field Measured									
pH		pH units	7.36	7.76	7.60	7.53	7.71	7.77	7.27
Conductivity		uS/cm	85.93	113	140.45	123.2	124.1	241	131.5
Temperature		°C	6.52	15.6	16.3	13.55	14.7	5.4	11.5
Turbidity		NTU	0.48	1.68	0.77	1.93	1.59	1.61	2.26
Conventional Parameters									
Hardness		mg CaCO3/L	34.33	33.67	64	36.75	33	89	45
Total suspended solids		mg/L	1	1	1.25	2.25	3	< 1	1
Total dissolved solids		mg/L	59.33	68.67	120	71.5	67	121	68
Total organic carbon		mg/L	3.6	3.7	3.48	4.48	3.6	4.6	3.6
Dissolved organic carbon		mg/L	3.47	3.6	2.55	4.3	3.2	4	3.1
Major Ions									
Alkalinity		mg CaCO3/L	25.33	26.33	37	39.5	28	56	26
Bicarbonate		mg CaCO3/L	-	-	37	39.5	28	56	26
Bromide		mg/L	0.027	0.023	0.063	0.025	0.02	0.05	0.02
Carbonate		mg CaCO3/L	-	-	2	2	< 2	< 2	< 2
Chloride	120	mg/L	2.77	3.57	9.3	4.45	4	8.1	4.1
Total Cyanide		mg/L	0.005	0.005	0.003	0.0044	< 0.001	0.001	< 0.001
Free Cyanide		mg/L	0.0083	0.005	0.005	0.005	< 0.005	< 0.005	< 0.005
Cyanide WAD		mg/L	0.005	0.005	0.003	0.0026	< 0.001	< 0.001	< 0.001
Fluoride		mg/L	0.13	0.12	0.13	0.13	0.1	0.19	0.13
Magnesium		mg/L	3.07	2.66	6.44	3.79	3.26	7.58	4.27
Sulphate		mg/L	16.37	25.2	33.07	17.85	19.8	47.8	22.2
Silica		mg/L	-	-	0.63	0.61	0.85	0.39	0.43
Thiosulfates		mg/L	0.02	0.02	0.02	0.02	< 0.02	< 0.02	< 0.02
Thiocyanates		mg/L	0.05	0.057	22.56	0.05	< 0.05	< 0.05	< 0.05
Nutrients and Chlorophyll a									
Nitrate		mg/L	0.203	0.15	0.275	0.0175	< 0.01	0.12	0.02
Nitrite		mg/L	0.01	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01
Ammonia Nitrogen		mg/L	0.01	0.01	0.045	0.05	< 0.01	0.03	0.04
Ammonia (NH3)		mg/L	0.01	0.01	0.01	0.03	< 0.01	< 0.01	< 0.01
Total Kjeldahl nitrogen		mg/L	1.41	1.60	7.21	0.62	0.4	0.24	0.36
Total phosphorus		mg/L	0.0058	0.0094	0.022	1.72	0.004	< 0.01	0.0039
Dissolved phosphorus		mg/L	-	-	0.04	-	0.004	-	-
Orthophosphate		mg/L	0.01	0.017	0.01	0.01	0.01	< 0.01	< 0.01
Total Metals									
Aluminum		mg/L	0.030	0.012	0.011	0.016	< 0.006	< 0.005	< 0.005
Antimony		mg/L	0.0001	0.0001	0.000125	0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.005	mg/L	0.0005	0.0072	0.0011	0.0005	< 0.0005	< 0.0005	< 0.0005
Barium		mg/L	0.0036	0.0034	0.0055	0.0035	0.006	0.006	0.0026
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	0.00009	mg/L	0.00002	0.00002	0.00005	0.00002	< 0.00002	< 0.00002	< 0.00002
Calcium		mg/L	-	-	-	-	8.38	23.1	11.5
Chromium		mg/L	0.0006	0.0012	0.0013	0.00065	< 0.0006	< 0.0006	0.0007
Cobalt		mg/L	0.0005	0.0005	0.0005	0.0006	< 0.0005	< 0.0005	< 0.0005
Copper		mg/L	0.00083	0.00053	0.0013	0.0048	0.0006	0.0013	0.0006
Iron	0.3	mg/L	0.47	0.11	0.055	0.22	0.07	0.06	0.04
Lead		mg/L	0.0006	0.0003	0.0006	0.00053	< 0.0003	< 0.0003	< 0.0003
Lithium		mg/L	0.005	0.022	0.0005	0.005	< 0.005	< 0.005	< 0.005
Magnesium		mg/L	3.3	3.21	5.61	3.38	2.94	7.75	4.1
Manganese		mg/L	0.0025	0.0054	0.0055	0.020	0.0082	0.0092	0.0035
Mercury	0.000026	mg/L	0.00001	0.00002	0.00001	0.000038	< 0.00001	< 0.00001	< 0.00001
Molybdenum	0.073	mg/L	0.0005	0.00053	0.0012	0.0005	< 0.0005	0.0021	< 0.0005
Nickel		mg/L	0.0010	0.00067	0.0027	0.0055	0.0015	0.0026	0.0011
Potassium		mg/L	1.1	1.04	2.09	1.16	1.02	2.89	1.3
Selenium	0.001	mg/L	0.001	0.001	0.001	0.001	< 0.001	0.0005	< 0.0005
Silver	0.0001	mg/L	0.0001	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium		mg/L	-	-	5.0	2.81	2.54	5.77	3.22
Strontium		mg/L	0.034	0.038	0.073	39.25	0.042	0.092	0.045
Tellurium		mg/L	-	-	0.0006	0.0005	0.001	< 0.0005	-
Thallium	0.0008	mg/L	0.005	0.005	0.0008	0.0008	< 0.0002	< 0.0002	< 0.0002
Tin		mg/L	0.001	0.001	0.0001	0.001	< 0.001	< 0.001	< 0.001
Titanium		mg/L	0.01	0.01	0.01	0.01	< 0.01	0.02	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	0.00088	< 0.0005	< 0.0005	< 0.0005
Zinc	0.03	mg/L	0.001	0.001	0.001	0.0015	< 0.001	< 0.001	< 0.001
Dissolved Metals									
Aluminum		mg/L	0.009	0.006	0.006	0.006	< 0.006	< 0.005	< 0.005
Antimony		mg/L	0.0001	0.0001	0.000125	0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.005	mg/L	0.0005	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	0.0015
Barium		mg/L	0.0035	0.002	0.047	0.0027	0.004	0.0055	0.0028
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	0.00009	mg/L	0.00002	0.00002	0.000053	0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium		mg/L	0.0006	0.0006	0.0015	0.00073	< 0.0006	< 0.0006	0.0007
Cobalt		mg/L	0.0005	0.0005	0.0005	0.00053	< 0.0005	< 0.0005	< 0.0005
Copper		mg/L	0.00073	0.0005	0.0011	0.00055	0.0008	0.0021	0.0009

Iron	0.3	mg/L	0.01	0.01	0.013	0.032		0.02	< 0.01	< 0.01
Lead		mg/L	0.00033	0.0003	0.0003	0.0003		< 0.0003	< 0.0003	< 0.0003
Lithium		mg/L	0.005	0.005	0.005	0.005		< 0.005	< 0.005	< 0.005
Manganese		mg/L	0.0005	0.00097	0.002	0.017		< 0.0005	0.0009	< 0.0005
Mercury	0.000026	mg/L	0.00001	0.00001	0.00001	0.00002		< 0.00001	< 0.00001	< 0.00001
Molybdenum	0.073	mg/L	0.0005	0.0005	0.0012	0.0005		< 0.0005	0.0019	< 0.0005
Nickel		mg/L	0.0011	0.0005	0.0025	0.0007		0.0013	0.0026	0.0013
Selenium	0.001	mg/L	0.001	0.001	0.001	0.001		< 0.001	< 0.001	< 0.0005
Silver	0.0001	mg/L	0.0001	0.0001	0.0001	0.0001		< 0.0001	< 0.0001	< 0.0001
Strontium		mg/L	0.032	0.036	67.75	0.037		0.041	0.093	0.048
Thallium	0.0008	mg/L	0.005	0.005	0.0008	0.0008		< 0.0002	< 0.0002	0.0005
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	0.02	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	0.03	mg/L	0.001	0.001	0.0013	0.001		< 0.001	< 0.001	0.002

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.20: Meadowbank 2018 Second Portage Lake Water Quality Monitoring

		Sample Date	Annual Average						
Parameters	**CCME Aquatic Freshwater**	**Units**	**2014**	**2015**	**2016**	**2017**	**7/11/2018**	**8/21/2018**	**9/5/2018**
Field Measured									
pH		pH units	7.18	7.81	7.4	7.71	-	7.22	7.73
Conductivity		uS/cm	68.43	55.9	91.27	102.45	-	46.4	60.4
Temperature		°C	5.62	-	15.1	14.23	-	5.7	6.5
Turbidity		NTU	0.13	0.28	3.23	0.86	-	2.27	2.42
Conventional Parameters									
pH		pH units	6.79	7.13	7.34	7.49	7.34	7.43	7.37
Specific conductivity		uS/cm	22	37	36	93	66	44	46
Dissolved Oxygen		mg/L	10.48	10.4	9.97	9.75	9.53	9.8	10.6
Hardness		mg CaCO3/L	21.33	12.17	18.88	19.17	23	18	18
Total suspended solids		mg/L	1.5	5	1.88	1.67	< 1	< 1	1
Total dissolved solids		mg/L	37	25	52	46	44	29	31
Total organic carbon		mg/L	2.67	1.9	2.93	3.3	2.7	1.8	2.1
Dissolved organic carbon		mg/L	2.37	1.65	-	3.18	2.3	1.6	1.8
Turbidity		NTU	1.3	-	0.57	0.89	0.43	0.34	0.55
Major Ions									
Alkalinity		mg CaCO3/L	24	17	19	31	22	14	14
Bicarbonate		mg CaCO3/L	-	-	19	31	22	14	14
Bromide		mg/L	0.023	0.01	0.01	0.015	0.02	< 0.01	< 0.01
Carbonate		mg CaCO3/L	-	-	2	2	< 2	< 2	< 2
Chloride	120	mg/L	1.4	1	2.9	2.45	2.3	1.1	1.3
Total Cyanide		mg/L	0.005	0.005	0.0035	0.0028	< 0.001	0.001	< 0.001
Free Cyanide		mg/L	0.008	0.005	0.005	0.005	< 0.005	< 0.005	< 0.005
Cyanide WAD		mg/L	0.005	0.005	0.003	0.0033	< 0.001	< 0.001	< 0.001
Fluoride		mg/L	0.1	0.075	0.1	0.11	0.09	0.09	0.08
Magnesium		mg/L	1.83	1.01	1.62	1.35	2.17	1.42	1.65
Sulphate		mg/L	8.6	11.05	16.25	10.8	7.9	6.6	9.5
Silica		mg/L	-	-	0.7	0.53	0.73	0.3	0.47
Thiosulfates		mg/L	0.02	0.02	0.02	0.02	< 0.02	< 0.02	< 0.02
Thiocyanates		mg/L	0.05	0.05	0.05	0.08	< 0.05	< 0.05	< 0.05
Nutrients and Chlorophyll a									
Nitrate		mg/L	0.083	0.015	0.038	0.04	< 0.01	0.01	0.08
Nitrite		mg/L	0.01	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01
Ammonia Nitrogen		mg/L	0.015	0.01	0.018	0.038	0.01	0.01	< 0.01
Ammonia (NH3)		mg/L	0.01	0.01	0.01	0.04	< 0.01	< 0.01	< 0.01
Total Kjeldahl nitrogen		mg/L	1.18	0.08	0.24	0.55	0.1	< 0.05	0.25
Total phosphorus		mg/L	0.017	0.006	0.58	1.02	0.0042	< 0.01	0.003
Orthophosphate		mg/L	0.01	0.01	0.01	0.01	0.03	< 0.01	< 0.01
Colour		CU	1	15	4	3	2	6	3
Chlorophyll a		ug/L	0.75	0.44	0.87	0.97	0.61	1.1	1.1
Total Metals									
Aluminum		mg/L	0.028	0.004	0.015	0.013	< 0.006	< 0.005	< 0.005
Antimony		mg/L	0.0001	0.0001	0.00015	0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.005	mg/L	0.0005	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005
Barium		mg/L	0.0027	0.0018	0.0021	0.0016	0.004	0.0025	0.0031
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	0.00009	mg/L	0.00002	0.00002	0.000038	0.00002	< 0.00002	< 0.00002	< 0.0002
Calcium		mg/L	-	-	7.87	5.78	5.69	4.75	4.72
Chromium		mg/L	0.0006	0.00095	0.0005	0.0006	< 0.0006	< 0.0006	< 0.0006
Cobalt		mg/L	0.0005	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005
Copper		mg/L	0.00067	0.0005	0.0011	0.00063	< 0.0005	0.0006	< 0.0005
Iron	0.3	mg/L	0.02	0.015	0.028	0.15	0.02	0.02	0.01
Lead		mg/L	0.0003	0.00013	0.00093	0.0009	< 0.0003	< 0.0003	< 0.0003
Lithium		mg/L	0.005	0.005	0.005	0.032	< 0.005	< 0.005	< 0.005
Magnesium		mg/L	2	1.08	1.43	2.13	2.21	1.54	1.66
Manganese		mg/L	0.00073	0.001	0.90	0.0023	< 0.0005	0.0014	0.0009
Mercury	0.000026	mg/L	0.0001	0.00001	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	0.073	mg/L	0.03	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005
Nickel		mg/L	0.0005	0.0005	0.0066	0.00095	0.0005	< 0.0005	< 0.0005
Potassium		mg/L	0.00057	0.29	0.8	0.75	0.35	0.67	0.6
Selenium	0.001	mg/L	0.001	0.001	0.001	0.001	< 0.001	< 0.0005	< 0.0005
Silver	0.0001	mg/L	0.0001	0.001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium		mg/L	-	-	2.33	1.72	1.84	0.95	1.12
Strontium		mg/L	0.022	0.018	0.025	0.027	0.034	0.018	0.02
Tellurium		mg/L	-	-	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005
Thallium	0.0008	mg/L	0.005	0.005	0.0008	0.0008	< 0.0008	< 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	0.0027	0.00065	< 0.0005	< 0.0005	< 0.0005
Zinc	0.03	mg/L	0.001	0.001	0.001	0.0013	< 0.001	< 0.001	0.001
Dissolved Metals									
Aluminum		mg/L	0.0073	0.006	0.006	0.006	0.037	< 0.005	0.008
Antimony		mg/L	0.0001	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001

Arsenic	0.005	mg/L	0.0005	0.0005	0.0005	0.0005		< 0.0005	0.0006	< 0.0005
Barium		mg/L	0.0027	0.0011	0.0016	0.0016		0.0026	0.0007	0.0015
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	0.00009	mg/L	0.00002	0.00002	0.000045	0.00002		< 0.00002	< 0.00002	< 0.00002
Chromium		mg/L	0.0006	0.0006	0.0011	0.00068		< 0.0006	< 0.0006	0.0008
Cobalt		mg/L	0.00087	0.0005	0.0005	0.0005		< 0.0005	< 0.0005	< 0.0005
Copper		mg/L	0.00057	0.0005	0.00063	0.0006		< 0.0005	0.0006	< 0.0005
Iron	0.3	mg/L	0.01	0.01	0.01	0.01		0.01	0.02	< 0.01
Lead		mg/L	0.0008	0.0003	0.00035	0.00043		< 0.0003	< 0.0003	< 0.0003
Lithium		mg/L	0.005	0.005	0.005	0.005		< 0.005	< 0.005	< 0.005
Manganese		mg/L	0.0005	0.0005	0.00055	0.00075		< 0.0005	< 0.0005	< 0.0005
Mercury	0.000026	mg/L	0.0001	0.0001	0.00001	0.000013		< 0.00001	< 0.00001	< 0.00001
Molybdenum	0.073	mg/L	0.0005	0.0005	0.0005	0.0005		< 0.0005	< 0.0005	< 0.0005
Nickel		mg/L	0.0006	0.0005	0.00155	0.00053		0.0008	< 0.0005	<0.0005
Selenium	0.001	mg/L	0.001	0.001	0.001	0.001		< 0.001	< 0.0005	< 0.0005
Silver	0.0001	mg/L	0.0001	0.0001	0.0001	0.0001		< 0.0001	< 0.0001	< 0.0001
Strontium		mg/L	0.02	0.0088	0.026	0.025		0.037	0.018	0.021
Thallium	0.0008	mg/L	0.005	0.0005	0.0008	0.0008		< 0.0008	< 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	0.0011	0.0005		< 0.0005	< 0.0005	< 0.0005
Zinc	0.03	mg/L	0.0013	0.001	0.003	0.001		< 0.001	< 0.001	< 0.001

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.22: Meadowbank 2018 South Portage Pit Sump Water Quality Monitoring (ST-19)

Parameters	Units	Annual Average 2013	2015	2016	2017		6/13/2018	7/2/2018
Field Measured								
pH	pH units	-	6.66	7.7	8.14		-	7.67
Turbidity	NTU	14.52	4.6	26.68	1.77		-	3.11
Conventional Parameters								
Hardness	mg CaCO3/L	-	195.5	273	191.67		166	193
Total suspended solids	mg/L	-	-	10.67	1.67		22	4
Total dissolved solids	mg/L	-	498	562	388		303	318
Major Ions								
Alkalinity	mg/L	-	63.67	63.67	76.67		61	55
Chloride	mg/L	1.65	15.4	30.5	28.7		16.5	16.7
Total Cyanide	mg/L	-	-	0.039	0.011		0.007	0.011
Cyanide WAD	mg/L	-	-	-	-		0.005	0.011
Free Cyanide	mg/L	-	-	-	-		-	< 0.005
Fluoride	mg/L	0.13	0.27	0.51	0.39		0.25	0.29
Sulphate	mg/L	82.65	135.5	245.13	129		130	133
Nutrients and Chlorophyll a								
Nitrate	mg/L	-	10.47	4.34	7.56		6.03	6.88
Nitrite	mg/L	-	0.195	0.15	0.35		0.11	0.12
Ammonia Nitrogen	mg/L	0.21	2.75	5.31	4.2		1.82	2.08
Ammonia (NH3)	mg/L	-	0.047	0.083	0.063		0.03	0.04
Total Metals								
Aluminum	mg/L	-	-	0.172	0.0183		0.321	0.035
Arsenic	mg/L	-	0.011	0.0021	0.0005		< 0.0005	0.0015
Barium	mg/L	-	-	0.011	0.014		0.0099	0.0097
Cadmium	mg/L	-	-	0.00024	0.00003		0.00003	0.00005
Chromium	mg/L	-	-	0.0028	0.0006		< 0.0006	0.0007
Copper	mg/L	-	0.0005	0.0019	0.00083		0.0019	0.0008
Iron	mg/L	-	-	1.54	0.04		0.77	0.07
Lead	mg/L	-	0.0003	0.0003	0.0091		0.0016	< 0.0003
Manganese	mg/L	-	-	0.26	0.088		0.1261	0.1209
Mercury	mg/L	-	-	0.000097	0.000057		< 0.00001	< 0.00001
Molybdenum	mg/L	-	-	0.066	0.029		0.0231	0.0202
Nickel	mg/L	-	0.087	0.04	0.019		0.0242	0.0182
Selenium	mg/L	-	-	0.002	0.0017		< 0.001	< 0.001
Silver	mg/L	-	-	0.0001	0.0001		< 0.0001	< 0.0001
Thallium	mg/L	-	-	0.0012	0.0008		< 0.0008	< 0.0008
Zinc	mg/L	-	0.068	0.004	0.001		< 0.001	0.001
Dissolved Metals								
Aluminum	mg/L	0.19	0.006	0.006	0.0067		0.023	0.016
Arsenic	mg/L	0.018	0.016	0.0005	0.0005		< 0.0005	0.0015
Barium	mg/L	0.0076	0.011	0.0173	0.01		0.0093	0.0107
Cadmium	mg/L	0.00002	0.00002	0.00024	0.000037		0.00005	0.00006
Chromium	mg/L	-	-	-	-		< 0.0006	< 0.0006
Copper	mg/L	0.013	0.0005	0.001	0.00053		0.0014	0.0007
Iron	mg/L	0.02	0.01	0.002	0.01		< 0.01	< 0.01
Lead	mg/L	0.0011	0.0003	0.0003	0.0003		< 0.0003	< 0.0003
Manganese	mg/L	0.012	0.092	0.5854	0.074		0.1250	0.1187
Mercury	mg/L	0.0001	0.000015	0.0001	0.00004		< 0.00001	< 0.00001
Molybdenum	mg/L	0.0018	0.063	0.0867	0.028		0.0230	0.0202
Nickel	mg/L	0.0047	0.032	0.0072	0.018		0.0222	0.0187
Selenium	mg/L	0.001	0.0015	0.002	0.0017		< 0.001	0.001
Silver	mg/L	0.00015	0.0001	0.0001	0.0001		< 0.0001	< 0.0001
Thallium	mg/L	0.005	0.005	0.0008	0.0008		< 0.0008	< 0.0008
Zinc	mg/L	0.003	0.001	0.004	0.001		< 0.001	< 0.001

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.23: Meadowbank 2018 Goose Island Pit Lake (ST-20)

ST-20 PIT LAKE	Sample Date	Annual Average						8/27/2018	9/18/2018
Parameters	**Units**	**2013**	**2014**	**2015**	**2016**	**2017**			
Field Measured									
pH	pH units	-	-	-	7.76	7.53		7.32	-
Conductivity	uS/cm	-	-	-	639.5	618.5		449	-
Turbidity	NTU	52.61	27.34	-	28.21	14.91		9.77	-
Conventional Parameters									
Hardness	mg CaCO3/L	-	-	104	173	172.25		100	129
Total suspended solids	mg/L	-	-	1	12.25	8.75		6	6
Total dissolved solids	mg/L	-	-	217	389.75	379.25		225	211
Total organic carbon	mg/L	-	-	2.1	1.35	3.3		-	3.2
Dissolved organic carbon	mg/L	-	-	0.3	0.2	3.13		4.3	3.4
Major Ions									
Alkalinity	mg CaCO3/L	-	-	75	81.25	84.5		55	68
Bicarbonate	mg CaCO3/L	-	-	75	81.25	84.5		9	63
Carbonate	mg CaCO3/L	-	-	2	2	2		< 2	< 2
Chloride	mg/L	62.2	52.45	13.7	24.58	25.25		14.7	14.1
Total Cyanide	mg/L	-	-	0.005	0.0048	0.006		0.001	0.001
Free Cyanide	mg/L	-	-	-	0.0052	0.005		< 0.005	< 0.005
Sulphate	mg/L	66.4	60.75	45.8	146	148.5		79.4	81
Reactive silica	mg/L	-	-	2.75	5.28	5.43		5.41	6.35
Nutrients and Chlorophyll a									
Nitrate	mg/L	-	-	4.11	2.92	3.83		2.05	2.33
Nitrite	mg/L	-	-	0.08	0.26	0.085		0.04	0.03
Ammonia Nitrogen	mg/L	0.3	0.064	0.57	3.65	0.95		0.12	0.2
Ammonia (NH3)	mg/L	-	-	-	0.0825	0.033		0.01	< 0.01
Total Kjeldahl nitrogen	mg/L	-	-	0.49	3.44	1.39		0.69	0.86
Total phosphorus	mg-P/L	-	-	0.01	0.023	0.03		0.05	0.06
Orthophosphate	mg-P/L	-	-	< 0.01	0.043	0.013		0.01	0.06
Total Metals									
Aluminum	mg/L	-	-	0.011	0.40	0.36		0.085	0.128
Antimony	mg/L	-	-	0.0018	0.0015	0.00075		0.0003	0.00002
Arsenic	mg/L	-	-	0.0061	0.0005	0.0008		< 0.0005	0.0054
Barium	mg/L	-	-	0.0166	0.048	0.054		0.0258	0.0361
Beryllium	mg/L	-	-	0.0005	0.0005	0.0005		< 0.0005	< 0.0005
Boron	mg/L	-	-	0.11	0.058	0.08		0.06	0.06
Cadmium	mg/L	-	-	0.00002	0.000028	0.00002		< 0.00002	0.00006
Calcium	mg/L	-	-	0.0025	-	-		25.6	32.1
Chromium	mg/L	-	-	0.0007	0.0035	0.0036		0.002	0.0011
Copper	mg/L	-	-	0.07	0.0021	0.0011		0.001	0.0015
Iron	mg/L	-	-	0.0003	0.85	0.8		0.12	0.18
Lead	mg/L	-	-	0.005	0.0006	0.0072		< 0.0003	< 0.0003
Lithium	mg/L	-	-	11.1	0.005	0.0042		< 0.005	< 0.005
Magnesium	mg/L	-	-	0.0175	14.93	15.48		8.83	11.9
Manganese	mg/L	-	-	0.00005	0.15	0.098		0.0086	0.0155
Mercury	mg/L	-	-	0.0145	0.000016	0.000058		< 0.00001	< 0.00001
Molybdenum	mg/L	-	-	0.0097	0.024	0.0207		0.0124	0.0171
Nickel	mg/L	-	-	5.81	0.012	0.017		0.0108	0.0133
Potassium	mg/L	-	-	0.001	9.98	9.1		6.1	7.37
Selenium	mg/L	-	-	-	0.001	0.0017		< 0.0005	0.0014
Sodium	mg/L	-	-	18.5	37.05	36.48		17.8	27.4
Strontium	mg/L	-	-	0.177	0.27	0.33		0.183	0.213
Thallium	mg/L	-	-	0.005	0.0008	0.0008		< 0.0002	< 0.0002
Tin	mg/L	-	-	0.001	0.001	0.001		< 0.001	< 0.001
Titanium	mg/L	-	-	0.01	0.055	0.055		0.03	< 0.01
Uranium	mg/L	-	-	0.003	0.0088	0.011		0.005	0.008
Vanadium	mg/L	-	-	0.0005	0.0005	0.00073		< 0.00005	< 0.00005
Zinc	mg/L	-	-	0.002	0.003	0.0015		< 0.001	0.003
Dissolved Metals									
Aluminum	mg/L	0.113	0.031	0.006	0.006	0.006		< 0.005	0.054
Antimony	mg/L	-	-	0.002	0.0015	0.00073		0.0004	< 0.0001
Arsenic	mg/L	0.0046	0.0036	0.0005	0.0005	0.00078		< 0.0005	0.0053
Barium	mg/L	0.133	0.028	0.0163	0.045	0.048		0.024	0.0312
Beryllium	mg/L	-	-	0.0005	0.0005	0.0005		0.0008	< 0.0005
Boron	mg/L	-	-	0.12	0.05	0.065		0.06	0.07
Cadmium	mg/L	0.000045	0.00002	0.00002	0.000033	0.00002		0.0001	< 0.00002
Chromium	mg/L	-	-	0.0006	0.0017	0.0006		0.003	< 0.0006
Copper	mg/L	0.071	0.0009	0.0005	0.0006	0.0009		0.0007	0.001

Iron	mg/L	0.105	0.01	0.01	0.01	0.015		< 0.01	< 0.01
Lead	mg/L	0.0003	0.0003	0.0003	0.0005	0.0054		< 0.0003	< 0.0003
Lithium	mg/L	-	-	0.005	0.005	0.005		< 0.005	< 0.005
Manganese	mg/L	0.22	0.059	0.0058	0.12	0.072		0.0086	< 0.0005
Mercury	mg/L	0.0001	0.0001	0.00006	0.00014	0.000038		< 0.00001	< 0.00001
Molybdenum	mg/L	0.021	0.018	0.0148	0.023	0.021		0.0124	0.0123
Nickel	mg/L	0.06	0.015	0.0097	0.01	0.013		0.0097	0.0107
Selenium	mg/L	0.0015	0.001	0.001	0.001	0.0013		0.0006	0.0008
Strontium	mg/L	-	-	0.193	0.28	0.32		0.202	0.189
Thallium	mg/L	0.005	0.0001	0.005	0.0008	0.0008		< 0.0002	< 0.0002
Tin	mg/L	-	-	0.001	0.001	0.001		0.001	< 0.001
Titanium	mg/L	-	-	0.01	0.03	0.048		0.02	< 0.01
Uranium	mg/L	-	-	0.003	0.0083	0.012		0.006	0.008
Vanadium	mg/L	-	-	0.0005	0.0005	0.0005		< 0.0005	< 0.0005
Zinc	mg/L	0.0075	0.001	0.001	0.001	0.0013		< 0.001	< 0.001

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.24: Meadowbank 2018 Goose Island Pit Sump (ST-20)

ST-20 PIT SUMP	Sample Date	Annual Average						7/4/2018	8/27/2018	9/24/2018
Parameters	**Units**	**2013**	**2014**	**2015**	**2016**	**2017**				
Field Measured										
pH	pH units	-	-	7.37	7.73	7.92		7.61	7.32	7.51
Turbidity	NTU	52.61	27.34	41.13	23.77	9.02		26.3	9.77	4.44
Conventional Parameters										
Hardness	mg CaCO3/L	-	-	134	127	226		105	161	182
Total suspended solids	mg/L	-	-	7	18.25	5		10	6	8
Total dissolved solids	mg/L	-	-	180	238	423		163	284	262
Major Ions										
Alkalinity	mg CaCO3/L	-	-	56.5	4	85.67		41	55	43
Chloride	mg/L	62.2	52.45	22.17	13.35	12.7		5.3	9.1	8.7
Total Cyanide	mg/L	-	-	0.008	0.004	0.002		0.008	< 0.001	0.001
Cyanide WAD	mg/L	-	-	-	0.004	0.0017		0.008	< 0.001	< 0.001
Free Cyanide	mg/L	-	-	-	0.005	0.005		< 0.005	< 0.005	< 0.005
Fluoride	mg/L	0.72	0.94	0.4	0.34	-		0.14	0.22	0.24
Sulphate	mg/L	66.4	60.75	78.97	84.2	147.33		62.5	130	153
Nutrients and Chlorophyll a										
Nitrate	mg/L	-	-	2.96	3.71	13.22		2.47	5.58	8.05
Nitrite	mg/L	-	-	0.19	0.023	0.13		< 0.01	0.03	0.02
Ammonia Nitrogen	mg/L	0.3	0.064	1.13	0.1	1.16		0.25	0.11	0.11
Ammonia (NH3)	mg/L	-	-	0.015	0.01	0.02		< 0.01	< 0.01	< 0.01
Total Metals										
Aluminum	mg/L	-	-	0.305	0.387	0.112		0.504	0.043	0.052
Arsenic	mg/L	-	-	0.0014	0.00063	0.0029		0.0030	< 0.0005	0.001
Barium	mg/L	-	-	0.0276	0.021	0.041		0.0139	0.024	0.0276
Cadmium	mg/L	-	-	0.00002	0.000048	0.000027		< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	-	-	0.0006	0.0033	0.0006		0.0042	0.0025	0.0013
Copper	mg/L	-	-	0.0023	0.003	0.002		0.0016	0.0013	0.0016
Iron	mg/L	-	-	0.69	0.67	0.21		0.79	0.07	0.11
Lead	mg/L	-	-	0.00048	0.0003	0.0003		< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	-	-	0.2682	0.068	0.099		0.1192	0.1359	0.0971
Mercury	mg/L	-	-	0.00001	0.00001	0.00002		< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	-	-	0.0138	0.0068	0.0066		0.0045	0.0054	0.0047
Nickel	mg/L	-	-	0.038	0.04	0.076		0.0324	0.0902	0.1036
Selenium	mg/L	-	-	0.001	0.001	-		0.001	0.0009	< 0.0005
Silver	mg/L	-	-	0.0001	0.0001	0.0017		< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	-	-	0.005	0.0011	0.0008		< 0.0008	< 0.0002	< 0.0002
Zinc	mg/L	-	-	0.001	0.003	0.0023		0.003	< 0.001	< 0.001
Dissolved Metals										
Aluminum	mg/L	0.11	0.031	0.006	0.006	0.0083		< 0.006	< 0.005	0.064
Arsenic	mg/L	0.0046	0.0036	0.0005	0.0005	0.0005		0.0014	< 0.0005	0.0008
Barium	mg/L	0.13	0.028	0.017	0.016	0.038		0.0116	0.024	0.035
Cadmium	mg/L	4.5E-05	0.00002	0.00002	0.00002	0.00002		< 0.00002	0.00011	< 0.00002
Copper	mg/L	0.071	0.0009	0.0014	0.00095	0.00087		< 0.0005	0.0011	0.0018
Iron	mg/L	0.105	0.01	0.01	0.01	0.01		< 0.01	< 0.01	< 0.01
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003		< 0.0003	< 0.0003	0.0012
Manganese	mg/L	0.22	0.059	0.18	0.048	0.084		0.1043	0.1245	0.1244
Mercury	mg/L	0.0001	0.0001	0.000013	0.00001	0.00002		0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.021	0.018	0.0099	0.0064	0.007		0.0054	0.0059	0.0065
Nickel	mg/L	0.06	0.015	0.033	0.035	0.07		0.0283	0.0888	0.1311
Selenium	mg/L	0.0015	0.001	0.0017	0.001	0.0017		0.003	0.0005	0.0045
Silver	mg/L	0.00015	0.0001	0.0001	0.0001	0.0001		< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.005	0.005	0.005	0.0008	0.0008		< 0.0008	< 0.0002	< 0.0002
Zinc	mg/L	0.0075	0.001	0.001	0.001	0.002		0.001	< 0.001	< 0.001

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.25: Meadowbank 2018 Tailings Reclaim Pond Water Quality Monitoring (ST-21)

ST-21 South Cell	Sample Date	Annual Average					1/2/2018	2/13/2018	3/6/2018	4/2/2018	5/7/2018	6/4/2018	7/2/2018	8/6/2018	9/3/2018	10/2/2018	11/6/2018	12/4/2018
Parameters	**Units**	**2013**	**2014**	**2015**	**2016**	**2017**												
Field Measured																		
pH	pH units	-	-	7.99	8.14	8.22	8.27	-	8.25	8.47	8.24	8.79	8.26	8.1	7.98	8.16	8.01	8.16
Conductivity	us/cm	-	5.13	-	-	2359.62	3.27	-	2.2	4.32	3.92	4.01	3.39	3.42	3.29	3.72	4.49	4.19
Dissolved oxygen	mg/L	-	-	-	-	8.27	9.74	-	-	10.06	-	-	-	-	-	-	-	-
Turbidity	NTU	15.31	6.0	10.68	10.59	7.85	12.4	-	14.3	5.16	7.5	83.3	12.3	9.89	5	7.84	13.9	7.53
Conventional Parameters																		
pH	pH units	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.2	-
Hardness	mg CaCO3/L	-	-	1217.81	1264.33	1223.74	1343	1516	1620	1164	1034	959	818	712	887	1092	994	1291
Total dissolved solids	mg/L	2949.09	3669.14	2498.54	2338.17	3033.05	3560	3464	3247	3085	2488	2628	2131	2466	2096	1524	2366	2482
Total suspended solids	mg/L	-	13.58	13.17	20.67	10.84	4	2	8	5	6	7	21	10	5	12	6	5
Dissolved organic carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	44.2	41.9	37.6	35.6	10.8	67.3
Major Ions																		
Alkalinity	mg CaCO3/L	-	-	122.69	124.83	126.85	127	112	117	113	104	87	104	121	120	117	143	152
Chloride	mg/L	931.33	1747.38	537.96	465.25	370.82	543	499	560	556	484	511	309	338	313	324	418	445
Cyanate	mg/L	-	-	-	67.20	46.65	59.5	105	150	109	103	175	< 0.01	43.3	21	31.1	30.7	41.2
Cyanide WAD	mg/L	-	-	0.31	0.64	0.17	0.023	0.069	0.019	0.04	0.002	0.005	0.12	0.051	0.015	0.024	0.523	0.084
Free Cyanide	mg/L	-	-	0.011	0.031	0.37	0.013	0.42	-	0.764	< 0.005	0.121	0.07	-	0.022	0.025	-	0.026
Total Cyanide	mg/L	11.35	9.86	4.0	3.93	0.89	1.08	1.76	2.57	1.29	0.172	2.82	0.204	0.797	0.023	0.044	0.899	0.558
Fluoride	mg/L	2.17	2.59	0.65	0.58	0.4	0.39	0.42	0.48	0.45	0.45	0.47	0.48	0.58	0.47	0.46	0.49	0.55
Sulphate	mg/L	2033.67	2217.86	1644.85	1939.17	1855.43	2909	2365	2348	2372	2148	1825	1538	1977	1950	1847	2185	2344
Thiocyanate	mg/L	-	-	-	214	108.21	< 0.17	170	112	152	126	35.4	127	72	101	82.5	42.2	71.3
Nutrients and Chlorophyll a																		
Nitrate	mg/L	15.22	26.69	9.54	7.21	3.53	4.13	4.82	4.51	5.68	4.6	6.77	4.24	5.86	4.83	3.79	4.28	4.78
Nitrite	mg/L	0.55	0.34	0.32	0.19	0.22	0.2	0.22	0.2	0.15	0.19	0.16	0.08	5.86	0.11	0.15	0.16	0.13
Ammonia Nitrogen	mg/L	25.7	0.7	37.57	42.32	43.57	60.8	57.8	62.5	51.1	62.5	50.6	41.3	44.4	38	39.4	48.6	48.8
Ammonia (NH3)	mg/L	-	-	3.11	1.96	1.28	2.17	1.93	2.39	2.09	2.34	3.88	1.58	1.04	0.87	0.3	1.86	2.04
Total Metals																		
Aluminum	mg/L	-	-	0.0903	0.144	0.11	0.021	0.095	0.07	0.008	0.089	2.25	0.118	0.006	0.039	0.096	0.037	0.021
Arsenic	mg/L	-	-	0.017	0.015	0.0086	0.0094	< 0.0005	0.0076	0.0377	0.0065	0.0099	0.0015	0.0248	0.0173	0.0216	0.016	0.0363
Barium	mg/L	0.071	0.077	0.075	0.093	0.086	0.0865	0.1532	0.2004	0.08	0.1196	0.0806	0.0704	0.0599	0.0475	0.633	0.0529	0.0574
Cadmium	mg/L	-	-	0.00078	0.0013	0.0015	0.00237	0.00213	0.00007	0.0014	0.00186	0.00444	0.00293	0.0019	0.0097	0.00214	0.00118	0.00222
Calcium	mg/L	-	-	-	-	-	-	-	-	-	-	-	281	253	307	388	339	445
Chromium	mg/L	-	-	0.0015	0.0013	0.0015	0.0031	0.0038	0.0008	0.0023	< 0.0006	0.0074	0.0008	< 0.0006	0.0006	0.0016	0.0009	0.0016
Copper	mg/L	-	-	1.1	0.46	0.37	0.9318	0.4288	3.409	0.3385	0.9857	1.682	0.7239	0.3659	0.2344	0.7016	0.9924	0.9972
Iron	mg/L	-	-	0.63	1.01	0.049	0.339	1.03	0.799	0.27	0.56	7.59	0.96	0.02	0.18	0.57	0.39	0.4
Lead	mg/L	-	-	0.00046	0.00071	0.0014	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0235	0.0009	0.0007	0.0015	0.0037	0.0041	0.0015
Magnesium	mg/L	-	-	-	-	-	-	-	-	-	-	-	28.4	19.7	29.4	30.1	36	43.8
Manganese	mg/L	-	-	0.69	0.21	0.28	0.2085	0.4385	0.3445	0.3162	0.3818	0.2235	0.487	0.298	0.6312	0.8848	0.7544	0.8694
Mercury	mg/L	-	-	0.00025	0.00035	0.00027	0.00045	0.00064	< 0.00001	0.00067	0.00002	< 0.00001	0.00003	0.00018	< 0.0001	< 0.0001	0.00001	< 0.00001
Molybdenum	mg/L	-	-	0.31	0.42	0.53	0.7219	0.7054	0.6229	0.5221	0.6365	0.5224	0.3821	0.4087	0.3779	0.4065	0.4105	0.4844
Nickel	mg/L	-	-	0.11	0.052	0.13	0.1052	0.068	0.3051	0.0668	0.1738	0.1361	0.1436	0.1061	0.0755	0.0863	0.1232	0.0544
Potassium	mg/L	-	-	-	-	-	-	-	-	-	-	-	96.6	82	87.2	105	113	130
Selenium	mg/L	-	-	0.062	0.073	0.048	0.086	0.085	0.073	0.069	0.061	0.091	0.071	0.0727	0.0581	0.0699	0.0511	0.0495
Silver	mg/L	-	-	0.0014	0.00088	0.00038	< 0.0001	< 0.0001	0.0006	< 0.0001	< 0.0001	< 0.0001	0.0002	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001
Sodium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	599	575	759	651	758
Thallium	mg/L	-	-	0.005	0.0017	0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	-	-	0.0029	0.0035	0.01	0.002	0.005	0.002	0.004	< 0.001	0.007	0.02	0.003	0.003	0.006	< 0.001	0.003
Dissolved Metals																		
Aluminum	mg/L	0.12	0.076	0.033	0.041	0.079	0.015	0.031	< 0.006	0.014	0.032	0.039	0.035	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Arsenic	mg/L	0.016	0.015	0.0096	0.013	0.00092	0.0104	< 0.0005	0.0083	0.0272	< 0.0005	0.0087	0.0015	0.0002	0.012	0.0214	0.0112	0.033
Barium	mg/L	0.083	0.089	0.083	0.095	0.076	0.0819	0.1376	0.1895	0.0847	0.103	0.0797	0.0625	0.0651	0.0455	-	0.0497	0.0599
Cadmium	mg/L	0.0017	0.0017	0.0064	0.0014	0.00127	0.00212	0.00143	0.00006	0.00144	0.000189	0.00454	0.00263	0.00194	0.00107	0.00225	0.00116	0.00217
Chromium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.0006	0.0037
Copper	mg/L	7.24	3.003	1.49	0.0936	0.17	0.3781	0.0149	0.8201	0.0271	0.1122	0.6625	0.5136	0.3854	0.2054	0.6379	0.8297	0.0662
Iron	mg/L	0.49	0.23	0.32	0.45	0.21	0.018	0.59	0.01	0.08	0.02	0.02	0.05	0.01	0.01	< 0.01	0.04	0.06
Lead	mg/L	0.0019	0.0003	0.00032	0.0003	0.0011	< 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	0.20	0.024	0.43	0.19	0.25	0.1977	0.4013	0.315	0.3105	0.3245	0.1485	0.487	0.3685	0.6096	0.9665	0.6364	0.8173
Mercury	mg/L	0.00019	0.00041	0.00034	0.00032	0.0003	0.00054	0.00067	< 0.00001	0.0006	0.00001	< 0.00001	0.00002	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.38	0.44	0.31	0.43	0.49	0.7035	0.6232	0.6277	0.5523	0.5675	0.5224	0.4249	0.4502	0.3694	0.4334	0.4288	0.4938
Nickel	mg/L	0.30	0.41	0.076	0.028	0.095	0.0699	0.0392	0.1381	0.0456	0.0928	0.0922	0.1368	0.1113	0.0738	0.0814	0.1139	0.0484
Selenium	mg/L	0.021	0.21	0.064	0.075	0.041	0.086	0.078	0.077	0.069	0.055	0.1	0.066	0.0799	0.0591	0.0773	0.0565	0.0511
Silver	mg/L	0.013	0.0087	0.0021	0.00078	0.00033	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	0.0276	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.0056	0.005	0.005	0.0016	0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.056	0.0019	0.0018	0.0019	0.0015	0.001	0.002	< 0.001	0.003	< 0.001	0.002	0.006	0.003	0.002	0.004	< 0.001	0.002

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.26: Meadowbank 2018 Vault Pit Sump Water Quality Monitoring (ST-23)

Parameters	Sample Date / Units	Annual Average 2014	2015	2016	2017	6/12/2018	7/4/2018	8/8/2018	9/25/2018	11/4/2018
Field Measured										
pH	pH units	-	7.11	7.76	7.72	7.26	7.34	7.76	7.41	7.81
Conductivity	us/cm	-	-	786.75	750.17	484	640	465	853	1129
Turbidity	NTU	18.95	283.5	12.07	26.75	30	8.92	1.89	13.8	5.65
Conventional Parameters										
Hardness	mg CaCO3/L	-	340	332.25	289.83	138	263	176	332	525
Total dissolved solids	mg/L	455.5	568	529	464	283	373	271	436	488
Total suspended solids	mg/L	-	-	13	30.83	24	2	1	8	4
Total organic carbon	mg/L	-	-	-	7.2	7.4	4.2	4.4	4.7	8.2
Dissolved organic carbon	mg/L	-	-	-	5.82	7.4	2.9	2.8	3.6	8.2
Major Ions										
Alkalinity	mg CaCO3/L	-	126	94.75	119.5	100	101	74	104	156
Bicarbonate	mg CaCO3/L	-	-	-	119.5	100	101	74	104	156
Carbonate	mg CaCO3/L	-	-	-	2	< 2	< 2	< 2	< 2	<2
Chloride	mg/L	30.9	33.2	29.33	35.58	19.4	27.6	11.1	24.7	43.6
Total Cyanide	mg/L	-	-	0.078	0.055	0.105	0.057	0.034	0.021	0.028
Free Cyanide	mg/L	-	-	0.017	0.017	0.044	0.057	-	0.01	-
Fluoride	mg/L	0.26	0.25	0.19	0.19	0.2	0.19	-	0.2	0.22
Sulphate	mg/L	148	124	143.98	146.37	74.4	144	101	242	356
Reactive silica	mg/L	-	-	-	8.55	7.15	4.83		3.81	8.59
Nutrients and Chlorophyll a										
Nitrate	mg/L	46.4	45.9	19.85	4.23	6.34	4.29	5.61	5.86	2.64
Nitrite	mg/L	1.5	2.05	0.27	0.15	0.23	0.09	0.08	0.09	0.06
Ammonia Nitrogen	mg/L	0.18	22.62	5.04	3.83	4.56	2.86	2.57	2.55	3.13
Total Kjeldahl nitrogen	mg/L	-	-	-	3.90	5.75	3.07	3.27	3.27	4.11
Ammonia (NH3)	mg/L	-	0.32	0.113	0.083	0.08	0.07	0.05	0.06	0.09
Total phosphorus	mg/L	-	-	-	0.058	0.03	0.01	0.01	0.02	< 0.01
Orthophosphate	mg/L	-	-	-	0.027	0.05	0.01	0.01	0.01	0.01
Total Metals										
Aluminum	mg/L	-	-	0.21	0.51	0.414	0.091	0.048	0.202	0.083
Antimony	mg/L	-	-	-	0.0042	0.414	0.0069	0.0064	0.0131	0.0078
Arsenic	mg/L	-	0.0005	0.0027	0.0067	< 0.0005	0.0045	< 0.0005	0.0023	0.0064
Barium	mg/L	-	-	0.032	0.035	0.0198	0.0247	0.0224	0.028	0.0505
Beryllium	mg/L	-	-	-	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	-	-	-	0.015	< 0.01	< 0.01	< 0.01	0.02	0.06
Cadmium	mg/L	-	-	0.00018	0.000043	0.00005	0.00028	0.00012	< 0.00002	< 0.00002
Calcium	mg/L	-	-	-	-	35.2	71.2	48.6	93.6	152
Chromium	mg/L	-	-	0.0013	0.0018	< 0.0006	0.0009	< 0.0006	0.0008	< 0.0006
Copper	mg/L	-	0.0078	0.0038	0.0010	0.0023	0.0007	0.0014	0.0009	0.0007
Iron	mg/L	-		0.65	1.16	0.78	0.2	0.08	0.44	0.18
Lead	mg/L	-	0.023	0.0003	0.00058	< 0.0003	< 0.0003	< 0.0003	0.0015	0.0041
Lithium	mg/L	-	-	-	0.0088	< 0.005	< 0.005	< 0.005	< 0.005	0.008
Magnesium	mg/L	-	33.2	29.33	21.4	12.4	20.9	13.4	24	35.6
Manganese	mg/L	-	-	0.15	0.31	0.0479	0.159	0.0762	0.0856	0.454
Mercury	mg/L	-	-	0.000033	0.000017	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	-	-	0.066	0.037	0.052	0.0536	0.0503	0.0981	0.0435
Nickel	mg/L	-	0.023	0.0069	0.010	0.0053	0.0065	0.0043	0.0063	0.0083
Potassium	mg/L	-	33.2	29.33	6.60	11.9	7.72	5.58	7.56	5.91
Selenium	mg/L	-		0.004	0.0018	< 0.001	0.002	0.0016	< 0.0005	0.0009
Sodium	mg/L	-	33.2	29.33	15	11.4	14.9	8.71	14.2	19.8
Strontium	mg/L	-	-	-	0.65	0.463	0.68	0.39	0.797	1.19
Thallium	mg/L	-	-	0.0011	0.0008	< 0.0008	< 0.0008	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	-	-	-	0.001	0.008	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L	-	-	-	0.08	0.04	0.07	0.05	< 0.01	< 0.01
Uranium	mg/L	-	-	-	0.010	< 0.0005	0.01	0.01	0.023	0.014
Vanadium	mg/L	-	-	-	0.00052	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	-	0.015	0.001	0.0035	< 0.001	0.001	< 0.001	0.001	0.002
Dissolved Metals										
Aluminum	mg/L	0.006	0.006	0.014	0.22	< 0.006	< 0.006	0.031	0.027	<0.005
Antimony	mg/L	-	-	-	0.0032	0.0085	0.0077	0.0063	0.0167	0.0052
Arsenic	mg/L	0.013	0.0005	0.0024	0.0047	< 0.0005	0.0031	< 0.0005	0.0033	0.0043
Barium	mg/L	0.59	0.070	0.031	0.027	0.0163	0.0247	0.0184	0.0373	0.0293
Beryllium	mg/L	-	-	-	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	-	-	-	0.037	0.01	< 0.01	0.01	0.03	0.03
Cadmium	mg/L	0.0003	0.00002	0.00013	0.000043	0.00029	0.0003	0.00018	< 0.00002	0.00003
Chromium	mg/L	-	-	-	0.0010	< 0.0006	0.0008	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.012	0.001	0.0024	0.0016	0.0015	0.0005	0.0034	0.0012	< 0.0005
Iron	mg/L	0.22	0.59	0.035	0.74	0.03	0.01	0.01	< 0.01	0.01
Lead	mg/L	0.0003	0.0003	0.0003	0.0006	< 0.0003	< 0.0003	< 0.0003	0.0003	< 0.0003
Lithium	mg/L	-	-	-	0.0053	< 0.005	< 0.005	< 0.005	0.005	0.007
Manganese	mg/L	0.1328	0.086	0.14	0.27	0.0413	0.1552	0.0722	0.0862	0.3099
Mercury	mg/L	0.0001	0.00001	0.00001	0.000023	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.11	0.11	0.066	0.028	0.0516	0.05	0.048	0.1212	0.0301
Nickel	mg/L	0.025	0.022	0.0066	0.0077	0.0044	0.0066	0.0041	0.0069	0.0056
Selenium	mg/L	0.007	0.004	0.004	0.0017	< 0.001	< 0.001	0.0014	0.002	< 0.0005
Strontium	mg/L	-	-	-	0.66	0.52	0.597	0.419	0.981	0.828
Thallium	mg/L	0.005	0.005	0.0011	0.0008	< 0.0008	< 0.0008	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	-	-	-	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L	-	-	-	0.065	0.03	0.05	0.05	< 0.1	< 0.01
Uranium	mg/L	-	-	-	0.0078	0.008	0.01	0.009	0.03	0.013
Vanadium	mg/L	-	-	-	0.0005	< 0.0005	< 0.0005	0.03	< 0.0005	< 0.0005

Zinc	mg/L	0.002	0.001	0.001	0.0012		< 0.001	0.001	0.014	0.001	0.001

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.27: Meadowbank 2018 Vault Waste Rock Storage Facility Seepage Water Quality Monitoring (ST-24)

Sample Date		Annual Average					6/12/2018	7/9/2018
Parameters	**Units**	**2014**	**2015**	**2016**	**2017**			
Field Measured								
pH	pH units	-	7.04	7.28	6.36		7.14	7.2
Conductivity	us/cm	-	107.7	152.17	247		141.4	393
Turbidity	NTU	25.9	17.75	74.12	91.6		57.2	11.4
Conventional Parameters								
Hardness	mg CaCO3/L	-	42	168.67	86		49	132
Total dissolved solids	mg/L	58	58.5	272	118		77	225
Total suspended solids	mg/L	-	-	26	38		69	9
Major Ions								
Alkalinity	mg CaCO3/L	-	37	27	32		31	39
Chloride	mg/L	3.2	1.6	4.67	1.5		2	3.6
Total Cyanide	mg/L	-	-	0.026	0.001		< 0.001	0.001
Free Cyanide	mg/L	-	-	-	-		-	0.007
Fluoride	mg/L	0.07	0.04	0.06	0.08		0.06	0.08
Sulphate	mg/L	5.1	-	155.63	43.6		37	103
Nutrients and Chlorophyll a								
Nitrate	mg/L	0.02	0.11	2.89	2.41		1.14	2.51
Nitrite	mg/L	0.01	0.01	0.063	0.02		0.02	0.03
Ammonia Nitrogen	mg/L	0.01	0.11	2.52	0.29		0.09	0.51
Ammonia (NH3)	mg/L	-	0.01	0.01	0.01		< 0.01	< 0.01
Total Metals								
Aluminum	mg/L	-	0.105	0.67	2.01		1.16	0.191
Arsenic	mg/L	-	0.0005	0.0005	0.0005		< 0.0005	< 0.0005
Barium	mg/L	-	0.0077	0.035	0.0253		0.0165	0.0244
Cadmium	mg/L	-	0.00002	0.00008	0.00008		< 0.00002	0.00022
Chromium	mg/L	-	0.0006	0.0006	0.0062		0.0009	< 0.0006
Copper	mg/L	-	0.0022	0.0031	0.0072		0.0045	0.0038
Iron	mg/L	-	1.1	8.54	2.92		2.32	0.87
Lead	mg/L	-	0.0018	0.00063	0.0003		< 0.0003	< 0.0003
Manganese	mg/L	-	0.086	1.42	0.1912		0.1132	0.3317
Mercury	mg/L	-	0.00001	0.00001	0.00001		< 0.00001	0.00005
Molybdenum	mg/L	-	0.001	0.0056	0.0072		0.004	0.0133
Nickel	mg/L	-	0.0026	0.016	0.125		0.0074	0.0088
Selenium	mg/L	-	0.001	0.001	0.001		< 0.001	0.003
Silver	mg/L	-	-	0.00013	0.0001		< 0.0001	< 0.0001
Thallium	mg/L	-	0.005	0.0012	0.0008		< 0.0008	< 0.0008
Zinc	mg/L	-	0.001	0.012	0.013		0.005	0.006

Footnote:
The detection limit value was used in the calculation of the annual average

8/8/2018
7.52
522
4.64
170
320
2
55
5.2
0.002
-
0.14
167
5.32
0.02
0.08
< 0.01
0.086
< 0.0005
0.0278
0.00007
< 0.0006
0.0121
0.2
< 0.0003
0.1216
< 0.00001
0.0155
0.0076
0.0007
< 0.0001
< 0.0002
0.001

Table 8.28: Meadowbank 2018 Vault Attenuation Pond Water Quality Monitoring (ST-25)

Parameters	Sample Date / Units	Annual Average 2014	2015	2016	2017		6/12/2018	7/4/2018	8/8/2018	9/25/2018
Field Measured										
pH	pH units	-	7.084	7.5	7.83		6.97	6.84	7.59	7.55
Conductivity	us/cm	-	215.3	279.35	309.5		251	377	341	339
Turbidity	NTU	5.89	10.99	14.6	16.39		19.8	5.55	3.64	1.52
Conventional Parameters										
Hardness	mg CaCO3/L	-	70	123.33	117.5		88	118	94	109
Total dissolved solids	mg/L	151	136.8	215.5	187.5		109	211	210	193
Total suspended solids	mg/L	-	-	7.83	30.25		28	5	9	1
Major Ions										
Alkalinity	mg CaCO3/L	-	41.6	47.83	54.25		34	31	46	32
Chloride	mg/L	4.1	6.8	9.73	9.83		5.9	7.6	8.5	6.2
Cyanide	mg/L	0.009	0.0078	0.013	0.0048		< 0.001	0.006	0.001	< 0.001
Fluoride	mg/L	0.14	0.087	0.14	0.1		0.1	0.16	0.2	0.13
Sulphate	mg/L	23.9	7.1	65.33	88.43		12.8	105	91.5	89.1
Nutrients and Chlorophyll a										
Nitrate	mg/L	2.3	4.67	2.75	2.19		1.9	1.96	2.81	4.08
Nitrite	mg/L	0.08	0.14	0.07	1.4		0.04	0.01	0.01	0.04
Ammonia Nitrogen	mg/L	0.025	2.23	1.2	1.86		1.28	0.87	0.32	1.04
Ammonia (NH3)	mg/L	-	0.032	0.017	0.023		0.01	< 0.01	< 0.01	< 0.01
Total Metals										
Aluminum	mg/L	-	0.027	0.196	0.634		0.712	0.189	0.091	0.025
Arsenic	mg/L	-	0.0005	0.0008	0.0041		< 0.0005	< 0.0005	< 0.0005	0.0007
Barium	mg/L	0.0081	0.014	0.027	0.023		0.0208	0.0226	0.0196	0.0315
Cadmium	mg/L	-	0.00002	0.000035	0.000023		< 0.00002	0.00017	0.00002	0.00005
Chromium	mg/L	-	0.0011	0.0082	0.0022		< 0.006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	-	0.0034	0.0025	0.0037		0.0087	0.0094	0.0045	0.0038
Iron	mg/L	-	0.17	0.60	0.99		0.93	0.57	0.4	0.1
Lead	mg/L	-	0.0006	0.0003	0.0003		< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	-	0.029	0.19	0.069		0.1769	0.2326	0.0657	0.0395
Mercury	mg/L	-	0.00001	0.0017	0.000013		< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	-	0.011	0.011	0.017		0.0042	0.0038	0.0042	0.0124
Nickel	mg/L	-	0.0036	0.0056	0.0052		0.0153	0.0186	0.007	0.008
Selenium	mg/L	-	0.001	0.001	0.0013		< 0.001	< 0.001	< 0.0005	0.0007
Silver	mg/L	-	-	0.0001	-		< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	-	0.005	0.001	0.0008		< 0.0008	< 0.0008	< 0.0002	< 0.0002
Zinc	mg/L	-	0.0022	0.0047	0.0018		0.011	0.017	< 0.001	0.006

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.29: Meadowbank 2018 WEP1 Water Quality Monitoring (ST-30)

Parameters	Sample Date / Units	Annual Average 2016	Annual Average 2017		6/13/2018	7/3/2018	8/8/2018	9/5/2018
Field Measured								
pH	pH units	7.36	7.49		-	7.18	7.49	7.58
Conductivity	us/cm	255.44	412.96		70.1	172.9	296	293
Turbidity	NTU	15.74	44.26		17.4	5.11	5.24	5.63
Conventional Parameters								
Hardness	mg CaCO3/L	102.2	157		24	51	89	98
Total dissolved solids	mg/L	220.8	249.25		38	94	183	131
Total suspended solids	mg/L	7	13.8		20	< 1	3	1
Major Ions								
Alkalinity	mg CaCO3/L	79.6	104.8		21	40	81	72
Chloride	mg/L	6.7	6.7		0.9	2.9	3.8	3.2
Total Cyanide	mg/L	0.0016	0.032		< 0.001	0.012	0.012	0.015
Free Cyanide	mg/L	0.005	0.0068		-	< 0.005	-	< 0.005
Cyanide WAD	mg/L	0.004	0.0032		< 0.001	0.007	0.006	0.009
Fluoride	mg/L	0.15	0.18		0.04	0.12	0.2	0.15
Sulphate	mg/L	55.86	71.38		10	25.7	55.7	37.5
Nutrients and Chlorophyll a								
Nitrate	mg/L	1.07	0.79		0.32	0.17	0.39	0.6
Nitrite	mg/L	0.054	0.048		0.02	0.02	0.02	0.01
Ammonia Nitrogen	mg/L	2.21	1.37		0.14	0.18	0.19	0.23
Ammonia (NH3)	mg/L	0.033	0.02		< 0.01	< 0.01	< 0.01	< 0.01
Total Metals								
Aluminum	mg/L	0.246	0.864		0.405	0.051	0.014	0.016
Arsenic	mg/L	0.00084	0.042		0.0166	0.0011	< 0.0005	< 0.0005
Barium	mg/L	0.017	0.019		0.0061	0.0091	0.0134	0.0122
Cadmium	mg/L	0.000082	0.00002		< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.0006	0.0036		0.0039	0.001	< 0.0006	< 0.0006
Copper	mg/L	0.017	0.012		0.0046	0.0126	0.0091	0.0174
Iron	mg/L	2.54	3.14		0.78	0.93	0.95	0.84
Lead	mg/L	0.0012	0.00086		< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	0.28	0.68		0.0409	0.0407	0.0791	0.1049
Mercury	mg/L	0.00018	0.00001		< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.019	0.0018		0.0024	0.0021	0.0014	0.0012
Nickel	mg/L	0.0056	0.012		0.0062	0.0037	0.004	0.0049
Selenium	mg/L	0.001	0.001		0.007	0.001	< 0.0005	< 0.0005
Silver	mg/L	0.00014	0.0001		< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.001	0.0008		< 0.0008	< 0.0008	< 0.0002	< 0.0002
Zinc	mg/L	0.0012	0.003		0.001	0.002	< 0.001	0.001

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.30: Meadowbank 2018 WEP2 Water Quality Monitoring (ST-31)

	Sample Date	Annual Average			6/13/2018	7/3/2018	8/8/2018	9/5/2018
Parameters	**Units**	**2016**	**2017**					
Field Measured								
pH	pH units	7.56	7.66		7.23	7.02	7.44	7.5
Conductivity	us/cm	121.33	370.4		47.9	271	271	228
Turbidity	NTU	17.32	12.94		47.5	9.35	4.99	11.1
Conventional Parameters								
Hardness	mg CaCO3/L	134.5	95.5		38	90	78	82
Total dissolved solids	mg/L	181.25	211.75		44	122	165	117
Total suspended solids	mg/L	5	10.25		289	23	1	4
Major Ions								
Alkalinity	mg CaCO3/L	112.5	78.75		26	59	66	57
Chloride	mg/L	5.48	12.18		2.1	8.6	6.2	5.5
Total Cyanide	mg/L	0.004	0.0023		< 0.001	0.001	0.003	0.001
Free Cyanide	mg/L	0.005	0.012		-	< 0.005	-	< 0.005
Cyanide WAD	mg/L	0.004	0.0018		< 0.001	0.001	0.003	0.001
Fluoride	mg/L	0.30	0.15		0.06	0.15	0.19	0.12
Sulphate	mg/L	32.2	41.7		7.6	28.2	51.9	35.7
Nutrients and Chlorophyll a								
Nitrate	mg/L	0.55	3.085		0.47	0.19	0.27	0.55
Nitrite	mg/L	0.01	0.19		0.01	0.01	0.02	< 0.01
Ammonia Nitrogen	mg/L	0.09	1.82		-	0.09	0.01	0.01
Ammonia (NH3)	mg/L	0.01	0.028		< 0.01	< 0.01	< 0.01	< 0.01
Total Metals								
Aluminum	mg/L	0.277	0.192		4.17	0.5	0.091	0.273
Arsenic	mg/L	0.00058	0.0046		0.0081	< 0.0005	< 0.0005	< 0.0005
Barium	mg/L	0.016	0.0097		0.0321	0.0143	0.0127	0.0122
Cadmium	mg/L	0.000038	0.00002		< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.0015	0.0027		0.0192	0.0016	0.001	0.0017
Copper	mg/L	0.0039	0.0016		0.0102	0.0038	0.0022	0.0023
Iron	mg/L	0.82	0.63		7.95	1.69	0.54	0.77
Lead	mg/L	0.0003	0.0022		< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	0.12	0.15		0.1714	0.1605	0.073	0.0943
Mercury	mg/L	0.00001	0.000025		< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0011	0.0014		< 0.0005	0.0008	0.0006	0.0012
Nickel	mg/L	0.0055	0.0039		0.0177	0.0077	0.0043	0.005
Selenium	mg/L	0.001	0.001		0.007	< 0.001	< 0.001	< 0.001
Silver	mg/L	0.0001	0.0001		< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.0011	0.0008		< 0.0008	< 0.0008	< 0.0002	< 0.0002
Zinc	mg/L	0.001	0.002		0.21	< 0.001	< 0.001	0.002

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.32: Meadowbank 2018 Saddle Dam 3 Water Quality Monitoring (ST-32)

Parameters	Sample Date / Units	Annual Average 2016	Annual Average 2017		6/11/2018	7/2/2018	8/7/2018	9/5/2018
Field Measured								
pH	pH units	6.84	7.57		7.22	7.26	7.85	7.46
Conductivity	µs/cm	590.33	739.75		305	526	863	672
Temperature	°C	13.59	6.1		2.2	9.5	12.8	7.3
Turbidity	NTU	32.03	104.55		352	14.8	5.83	19.3
Conventional Parameters								
Hardness	mg CaCO3/L	252.67	356.5		121	170	243	244
Total dissolved solids	mg/L	399	504.25		139	298	532	372
Total suspended solids	mg/L	14.33	664.5		200	8	5	10
Major Ions								
Alkalinity	mg CaCO3/L	45.67	120.75		47	853	88	75
Chloride	mg/L	20.27	16.18		6	9.2	23.4	20.1
Cyanide	mg/L	0.01	0.049		0.039	0.01	0.008	0.007
Fluoride	mg/L	0.35	0.38		0.1	0.29	0.52	0.36
Sulphate	mg/L	184.67	185.1		58.3	112	149	148
Nutrients and Chlorophyll a								
Nitrate	mg/L	8.83	16.53		4.55	9.09	41.7	18.9
Nitrite	mg/L	0.07	0.35		0.02	0.09	0.33	0.09
Ammonia Nitrogen	mg/L	1.40	4.34		2.07	4.52	20.5	0.06
Ammonia (NH3)	mg/L	0.01	0.038		0.03	0.09	0.33	0.06
Total Metals								
Aluminum	mg/L	0.245	11.01		4.98	0.154	0.041	0.649
Arsenic	mg/L	0.0005	0.0075		0.008	0.0092	0.0039	0.0085
Barium	mg/L	0.041	0.22		0.0372	0.0422	0.0471	0.0725
Cadmium	mg/L	0.00005	0.00013		0.0001	0.00007	< 0.00002	< 0.00002
Chromium	mg/L	0.0049	0.050		0.0448	0.002	0.0011	0.0079
Copper	mg/L	0.014	0.083		0.0273	0.0066	0.0049	0.0139
Iron	mg/L	2.28	22.38		8.54	0.51	0.15	1.54
Lead	mg/L	0.0078	0.015		0.0193	< 0.0003	< 0.0003	0.0018
Manganese	mg/L	1.41	2.88		0.2277	0.3275	0.5953	0.6262
Mercury	mg/L	0.00001	0.000048		< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0027	0.0037		0.0045	0.0069	0.0072	0.0067
Nickel	mg/L	0.21	0.18		0.0355	0.023	0.0653	0.0812
Selenium	mg/L	0.001	0.003		< 0.001	< 0.001	0.0014	0.0009
Silver	mg/L	0.0001	0.00043		< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.0008	0.0008		< 0.0008	< 0.0008	< 0.0002	< 0.0002
Zinc	mg/L	0.0053	0.073		0.016	0.005	0.002	0.006

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.34: Meadowbank 2018 Saddle Dam 1 Seepage Water Quality Monitoring (ST-S-2)

	Sample Date			Annual Average								
Parameters	**MAX GRAB**	**MAX MEAN**	**Units**	**2013**	**2014**	**2015**	**2016**	**2017**		**6/11/2018**	**7/3/2018**	**8/6/2018**
Field Measured												
pH			pH units	-	-	6.64	7.47	7.92		7.32	7.77	7.72
Conductivity			µs/cm	-	-	449.25	261.75	499.5		141.1	460	689
Temperature			°C	-	-	15.35	12.28	6.5		0.6	4.6	10
Turbidity			NTU	27.31	26.91	45.78	22.12	21.05		33.9	39.9	9.89
Conventional Parameters												
Hardness			mg CaCO3/L	228	-	175	179	215.25		48	276	250
Total dissolved solids			mg/L	-	-	-	303.75	302.25		69	364	412
Total suspended solids	30	15	mg/L	-	-	-	43.25	8.5		10	< 1	3
Major Ions												
Alkalinity			mg CaCO3/L	72	-	51	62.75	68.5		28	58	64
Chloride			mg/L	55.18	27.34	7.23	6.88	5.4		1.9	8	7.1
Total Cyanide			mg/L	-	-	-	0.013	0.0085		0.012	0.021	0.01
Free Cyanide			mg/L	-	-	-	0.005	0.014		< 0.005	< 0.005	-
Cyanide WAD			mg/L	-	-	-	0.003	0.00725		0.002	0.004	0.003
Fluoride			mg/L	0.30	0.26	0.21	0.20	0.21		0.05	0.23	0.39
Sulphate			mg/L	311.2	172.2	119.05	179.5	110.23		30	188	275
Nutrients and Chlorophyll a												
Nitrate			mg/L	16.80	9.88	7.50	8.20	9.72		0.68	4.39	9.1
Nitrite			mg/L	-	-	-	0.042	0.02		0.02	0.03	0.01
Ammonia Nitrogen			mg/L	0.052	0.04	1.51	0.13	0.095		0.14	0.22	0.07
Ammonia (NH3)			mg/L	2.44	2.24	0.015	0.01	0.01		< 0.01	< 0.01	< 0.01
Total Metals												
Aluminum			mg/L	0.36	0.36	0.41	0.39	0.28		0.365	0.29	0.049
Arsenic			mg/L	0.15	0.028	0.0073	0.028	0.036		0.0021	0.0022	0.0459
Barium			mg/L	0.046	0.020	0.018	0.017	0.016		0.0057	0.022	0.0235
Cadmium			mg/L	0.00011	0.000064	0.000035	0.00005	0.000025		< 0.00002	0.00004	0.00003
Chromium			mg/L	0.0017	0.0025	0.0017	0.0041	0.0046		0.0024	0.002	< 0.0006
Copper			mg/L	0.028	0.010	0.014	0.0087	0.0035		0.0053	0.0045	0.0026
Iron			mg/L	0.72	0.64	1.15	1.44	0.52		0.84	0.54	0.11
Lead			mg/L	0.0023	0.0003	0.0003	0.0092	0.0015		0.0014	< 0.0003	< 0.0003
Manganese			mg/L	0.42	0.24	0.33	0.28	0.081		0.0977	0.3952	0.2586
Mercury			mg/L	0.00001	0.00001	0.00001	0.00039	0.00024		< 0.00001	< 0.00001	0.00037
Molybdenum			mg/L	0.064	0.020	0.014	0.012	0.011		0.0017	0.0108	0.0164
Nickel			mg/L	0.13	0.027	0.026	0.031	0.025		0.0147	0.0294	0.0534
Selenium			mg/L	0.003	0.0016	0.0025	0.001	0.001		< 0.001	0.001	0.0009
Silver			mg/L	0.0004	0.0001	0.0001	0.0001	0.0001		< 0.0001	< 0.0001	< 0.0001
Thallium			mg/L	0.005	0.005	0.005	0.0011	0.0008		< 0.0008	< 0.0008	< 0.0002
Zinc			mg/L	0.079	0.0026	0.026	0.25	0.0025		< 0.001	< 0.001	0.165

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.36: Meadowbank 2018 Central Dike Seepage Water Quality Monitoring (ST-S-5)

			Sample Date	Annual Average				1/2/2018	2/6/2018	3/5/2018	4/2/2018	5/7/2018	6/4/2018	7/2/2018	8/6/2018	9/3/2018	10/1/2018	11/5/2018	12/4/2018
Parameters	**MAX GRAB**	**MAX MEAN**	**Units**	**2015**	**2016**	**2017**													
Field Measured																			
pH			pH units	7.37	7.71	7.52		7.87	7.59	7.46	7.28	7.61	7.47	-	7.76	7.38	7.8	7.37	-
Conductivity			µs/cm	2496.25	848.70	2188.84		3.15	3.65	2.46	3.86	3.68	3.35	-	3.45	3.3	3.7	4.09	-
Temperature			°C	12.65	11.16	8.06		0.9	5.3	5.7	2.5	3.68	6.8	-	9.1	8.8	-	3.1	-
Turbidity			NTU	10.21	10.33	11.89		13.5	13	14.1	17	15.6	20.4	-	16.4	24.9	21.6	16.2	-
Conventional Parameters																			
Hardness			mg CaCO3/L	1139.58	1175.83	1126.32		1175	926	1489	1099	877	997	1114	1059	1034	1109	1122	1132
Total dissolved Solids			mg/L	2239.67	2582.42	2752.73		2792	2900	2886	2614	2372	2309	2434	2479	2131	1654	1875	2062
Total suspended solids	30	15	mg/L	6.33	5.83	4.72		-	3	12	25	3	4	15	4	3	8	4	7
Dissolved organic carbon			mg/L	-	-	38.65		-	-	-	-	-	-	48.9	40.7	40.5	-	58.8	-
Major Ions																			
Alkalinity			mg CaCO3/L	179.75	145.25	124.73		125	118	117	118	116	108	109	117	109	108	113	134
Chloride			mg/L	498.13	451.17	379.36		520	428	579	599	496	426	362	427	421	420	404	433
Total Cyanide			mg/L	0.30	0.31	0.20		0.106	0.127	0.114	0.279	0.138	0.141	0.108	0.257	0.07	0.064	0.151	0.13
Free Cyanide			mg/L	0.06	0.08	0.36		0.06	-	-	0.053	0.064	0.094	0.068	0.036	0.043	0.049	0.03	0.035
Cyanide WAD			mg/L	0.18	0.21	0.08		0.077	0.064	0.073	0.107	0.09	0.098	0.067	0.075	0.045	0.036	0.054	0.58
Cyanide WAD (field measured)			mg/L	0.18	0.23	0.08		0.077	-	0.073	0.117	0.09	0.098	-	-	-	-	-	-
Fluoride			mg/L	0.69	0.53	0.48		0.5	0.61	0.55	0.59	0.54	0.47	0.57	0.66	0.51	0.5	0.51	0.58
Sulphate			mg/L	1449.21	1805.91	1713.75		2290	2033	2066	1928	2293	1867	1956	1979	1949	2005	1985	1878
Nutrients and Chlorophyll a																			
Nitrate			mg/L	2.79	0.60	0.10		0.05	0.01	< 0.01	< 0.01	< 0.01	0.39	0.07	0.13	0.11	0.01	-	< 0.01
Nitrite			mg/L	0.063	0.06	0.02		0.02	< 0.01	0.01	< 0.01	< 0.01	0.03	0.02	0.03	0.03	0.02	-	< 0.01
Ammonia Nitrogen			mg/L	17.89	27.32	29.83		31.4	31.3	29	33.5	32.5	25	34.4	37.7	34.3	29.1	27.4	32.3
Ammonia (NH3)			mg/L	0.27	0.39	0.38		0.46	< 0.01	0.41	0.42	0.37	0.29	0.46	0.58	0.48	0.35	0.35	0.49
Total Metals																			
Aluminum			mg/L	0.22	0.022	0.015		< 0.006	0.009	0.01	< 0.006	0.011	0.017	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Arsenic			mg/L	0.021	0.045	0.055		0.0587	0.0292	0.0577	0.0485	0.0443	0.0365	0.0357	0.0102	0.0397	0.0441	0.0532	0.0466
Barium			mg/L	0.034	0.032	0.024		0.0259	0.0189	0.0313	0.025	0.0243	0.0204	0.0308	0.0248	0.022	0.0256	0.0219	0.0233
Cadmium			mg/L	0.00042	0.00084	0.00079		0.001	0.00065	0.00003	0.00076	0.00071	0.00189	0.00165	0.00125	0.00058	0.00107	0.00005	0.00107
Calcium			mg/L	-	-	-		-	-	-	-	-	-	353	338	326	343	355	361
Chromium			mg/L	0.0025	0.0016	0.0012		0.0018	< 0.0006	< 0.0006	0.003	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper			mg/L	0.070	0.054	0.0054		0.0063	0.0066	0.0005	0.0041	0.0048	0.003	0.0034	0.0069	0.0055	0.006	< 0.0005	0.0079
Iron			mg/L	1.58	2.07	1.82		1.97	2	1.73	2.04	2.26	2.29	1.74	0.03	1.79	0.05	1.81	2.5
Lead			mg/L	0.0009	0.00083	0.0028		< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Magnesium			mg/L	-	-	-		-	-	-	-	-	-	56.6	52.3	53.6	61.4	57.8	56.2
Manganese			mg/L	2.80	2.20	2.19		2.362	1.913	2.58	2.34	2.127	1.617	2.231	2.406	2.261	1.995	2.211	2.399
Mercury			mg/L	0.000028	0.000085	0.00001		0.00006	0.00004	0.00003	0.00008	< 0.00001	0.00023	0.00001	0.00022	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum			mg/L	0.18	0.30	0.30		0.3197	0.2601	0.378	0.29	0.2627	0.2561	0.2922	0.3091	0.2911	0.2606	0.3016	0.2618
Nickel			mg/L	0.098	0.047	0.018		0.0239	0.0184	0.0137	0.0172	0.0161	0.0262	0.0327	0.0359	0.031	0.0264	0.0088	0.0273
Potassium			mg/L	-	-	69.75		-	-	-	-	-	63.7	85	69.4	70.4	75.7	78.6	85.8
Selenium			mg/L	0.026	0.034	0.014		0.017	0.012	0.002	0.006	0.005	0.014	0.018	0.0223	0.0128	0.0143	< 0.0005	0.0084
Silver			mg/L	0.0001	0.00022	0.00014		< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium			mg/L	-	-	442.5		-	-	-	-	-	590	525	638	527	566	551	558
Thallium			mg/L	0.005	0.0017	0.0008		< 0.0008	-	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Titanium			mg/L	-	0.0008	0.0008		-	< 0.0008	-	-	-	-	-	-	-	-	-	-
Zinc			mg/L	0.0032	0.0063	0.0025		0.002	< 0.001	< 0.001	0.002	< 0.001	< 0.001	0.006	< 0.001	< 0.001	< 0.001	< 0.001	0.002
Dissolved Metals																			
Aluminum			mg/L	0.006	0.006	0.0063		< 0.006	< 0.006	0.01	< 0.006	0.011	< 0.006	< 0.006	< 0.005	< 0.005	< 0.005	< 0.0005	< 0.005
Arsenic			mg/L	0.022	0.022	0.014		0.0167	0.017	0.0267	0.0221	0.013	0.0178	0.0042	0.0099	0.0067	0.0123	0.0115	0.0058
Barium			mg/L	-	-	0.021		0.0259	0.0305	0.0295	0.0242	0.0243	0.0213	0.0244	0.0248	0.0199	0.0256	0.0265	0.0215
Cadmium			mg/L	0.00051	0.00075	0.00075		0.00092	0.0008	0.00012	0.00079	0.00071	0.00224	0.00165	0.00117	0.00058	0.00113	0.00003	0.00115
Chromium			mg/L	0.0014	0.0016	0.00067		0.0021	0.0013	< 0.0006	0.0017	< 0.0006	< 0.0006	< 0.0006	0.0007	0.0008	0.0009	< 0.0006	0.0016
Copper			mg/L	0.0056	0.047	0.0053		0.0067	0.0098	< 0.0005	0.004	0.0034	0.0035	0.0111	0.0064	0.0063	0.006	< 0.0005	0.0074
Iron			mg/L	0.055	0.17	0.056		0.086	0.14	0.017	0.1	0.05	0.07	1.74	0.03	0.04	0.05	0.02	0.05
Lead			mg/L	0.0006	0.00071	0.0037		< 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		2.4	2.514	2.687	2.208	2.127	1.772	2.231	2.232	2.154	2.277	2.527	2.14
Mercury			mg/L	0.00004	0.000068	0.000098		0.00006	0.00003	< 0.00001	0.00008	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum			mg/L	0.21	0.29	0.30		0.3292	0.2601	0.39	0.2902	0.2627	0.2778	0.2922	0.2857	0.287	0.2997	0.3438	0.2594
Nickel			mg/L	0.049	0.061	0.018		0.0233	0.0237	0.0131	0.0177	0.0161	0.0295	0.0327	0.0334	0.0307	0.029	0.0099	0.0265
Selenium			mg/L	0.028	0.037	0.018		0.026	0.027	0.008	0.01	0.005	0.024	0.027	0.0216	0.0159	0.0227	0.008	0.0125
Silver			mg/L	0.0001	0.0002	0.00013		< 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	0.005	0.0017	0.0008		< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc			mg/L	0.001	0.0023	0.0015		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	0.001	< 0.001	< 0.001	0.002	0.001

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.38: Meadowbank 2018 Phaser Pit sump water quality monitoring (ST-41)

Parameters	Units	Sample Date 7/16/2018	8/22/2018	9/17/2018
Field Measured				
pH	pH units	7.71	-	7.66
Turbidity	NTU	-	-	8.51
Conventional Parameters				
Hardness	mg CaCO3/L	198	275	197
Total suspended solids	mg/L	13	6	2
Total dissolved solids	mg/L	530	322	260
Major Ions				
Alkalinity	mg CaCO3/L	174	91	86
Chloride	mg/L	15.9	9	5.4
Cyanide	mg/L	0.506	0.045	0.019
Cyanide WAD	ppm	0.185	0.043	0.014
Free Cyanide	mg/L	< 0.005	-	0.014
Fluoride	mg/L	0.19	0.22	0.16
Sulphate	mg/L	64.8	109	77.2
Nutrients and Chlorophyll a				
Nitrate	mg/L	45	24.5	9.04
Nitrite	mg/L	1.04	0.14	0.03
Ammonia Nitrogen	mg/L	28.5	6.42	2.98
Ammonia (NH3)	mg/L	0.53	0.17	0.03
Total Metals				
Aluminum	mg/L	0.195	0.188	0.208
Arsenic	mg/L	< 0.0005	0.0006	0.0037
Barium	mg/L	0.1446	0.0833	0.0582
Cadmium	mg/L	0.00018	0.00006	< 0.00002
Chromium	mg/L	< 0.0006	0.0021	0.0009
Copper	mg/L	0.0227	0.0047	0.0055
Iron	mg/L	0.69	0.49	0.39
Lead	mg/L	< 0.0003	< 0.0003	0.0012
Manganese	mg/L	0.143	0.0784	0.0384
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0432	0.0304	0.0145
Nickel	mg/L	0.0104	0.005	0.0023
Selenium	mg/L	0.002	0.0018	0.0009
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.0002	0.0003	< 0.0002
Zinc	mg/L	0.007	0.001	0.002
Dissolved Metals				
Aluminum	mg/L	< 0.006	< 0.006	0.087
Arsenic	mg/L	< 0.0005	< 0.0005	0.0025

Barium	mg/L	0.1377	0.0733	0.0471
Cadmium	mg/L	0.0002	0.00004	0.00002
Chromium	mg/L	< 0.0006	0.0024	< 0.0006
Copper	mg/L	0.0208	0.0045	0.0053
Iron	mg/L	0.21	< 0.01	< 0.01
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	0.1477	0.0618	0.0277
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0423	0.0266	0.0112
Nickel	mg/L	0.0105	0.0041	0.0014
Selenium	mg/L	< 0.001	0.0011	< 0.0005
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.004	< 0.001	< 0.001

Table 8.39: Meadowbank 2018 BBPhaser Pit sump water quality monitoring (ST-42)

Parameters	Sample Date / Units	7/16/2018	8/22/2018	9/17/2018
Field Measured				
pH	pH units	8	-	7.67
Turbidity	NTU	-	-	2.59
Conventional Parameters				
Hardness	mg CaCO3/L	165	384	279
Total suspended solids	mg/L	< 1	4	5
Total dissolved solids	mg/L	233	347	371
WQTC03-Major Ions				
Alkalinity	mg CaCO3/L	64	85	83
Chloride	mg/L	3.3	6.5	7.2
Total Cyanide	mg/L	0.003	0.009	0.068
Free Cyanide	mg/L	0.164	0.009	0.036
Cyanide WAD	ppm	0.003	0.008	0.032
Fluoride	mg/L	0.14	0.19	0.16
Sulphate	mg/L	103	239	193
Nutrients and Chlorophyll a				
Nitrate	mg/L	2.87	6.1	7.46
Nitrite	mg/L	0.05	0.15	0.14
Ammonia Nitrogen	mg/L	1.7	2.84	5.3
Ammonia (NH3)	mg/L	0.04	0.05	0.04
Total Metals				
Aluminum	mg/L	0.064	0.112	0.085
Arsenic	mg/L	0.0034	< 0.0005	0.0024
Barium	mg/L	0.0512	0.128	0.0777
Cadmium	mg/L	< 0.00002	0.00004	0.00006
Chromium	mg/L	< 0.0006	0.0011	< 0.0006
Copper	mg/L	0.0093	0.0071	0.0108
Iron	mg/L	0.09	0.14	0.21
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	0.2332	0.5182	0.3217
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0078	0.0108	0.0077
Nickel	mg/L	0.0124	0.0226	0.0147
Selenium	mg/L	< 0.001	0.0024	< 0.0005
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.007	0.011	0.01
Dissolved Metals				
Aluminum	mg/L	< 0.006	< 0.005	0.09
Arsenic	mg/L	0.0028	< 0.0005	0.0022

Barium	mg/L	0.0549	0.097	0.0763
Cadmium	mg/L	< 0.00002	0.00004	< 0.00002
Chromium	mg/L	< 0.0006	0.0023	< 0.0006
Copper	mg/L	0.007	0.0062	0.0091
Iron	mg/L	< 0.01	< 0.01	0.03
Lead	mg/L	< 0.0003	< 0.0003	0.0009
Manganese	mg/L	0.2135	0.4195	0.2887
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0082	0.0108	0.0077
Nickel	mg/L	0.0119	0.0171	0.0134
Selenium	mg/L	< 0.001	< 0.0005	0.0008
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.005	0.007	0.005

Table 8.40: Meadowbank 2018 Phaser Attenuation Pond water quality monitoring (ST-43)

Parameters	Sample Date / Units	7/16/2018	8/22/2018	9/17/2018
Field Measured				
pH	pH units	-	-	7.29
Turbidity	NTU	-	-	10.1
Conventional Parameters				
Hardness	mg CaCO3/L	145	307	310
Total suspended solids	mg/L	2	2	8
Total dissolved solids	mg/L	263	374	429
Major Ions				
Alkalinity	mg CaCO3/L	35	3	10
Chloride	mg/L	5.1	5	6.3
Total Cyanide	mg/L	0.004	0.001	0.011
Free Cyanide	mg/L	< 0.005	< 0.005	0.009
Cyanide WAD	mg/L	0.004	0.002	0.009
Fluoride	mg/L	0.13	0.18	0.13
Sulphate	mg/L	148	330	384
Nutrients and Chlorophyll a				
Nitrate	mg/L	5.36	4.58	6.71
Nitrite	mg/L	0.1	0.04	0.08
Ammonia Nitrogen	mg/L	4.23	2.96	4.01
Ammonia (NH3)	mg/L	0.05	< 0.01	< 0.01
Total Metals				
Aluminum	mg/L	0.231	0.84	0.477
Arsenic	mg/L	< 0.0005	< 0.0005	0.0016
Barium	mg/L	0.041	0.0762	0.0486
Cadmium	mg/L	0.00021	0.00201	0.00145
Chromium	mg/L	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.0099	0.0613	0.0338
Iron	mg/L	0.81	4.81	2.34
Lead	mg/L	< 0.0003	< 0.0003	0.0006
Manganese	mg/L	0.1652	1.061	0.7942
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0077	0.0009	0.002
Nickel	mg/L	0.02	0.1702	0.1091
Selenium	mg/L	< 0.0005	0.0012	0.0037
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.01	0.162	0.136
Dissolved Metals				
Aluminum	mg/L	0.04	0.384	0.477
Arsenic	mg/L	< 0.0005	< 0.0005	0.0009

Barium	mg/L	0.041	0.0772	0.0486
Cadmium	mg/L	0.00021	0.00225	0.00129
Chromium	mg/L	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.0099	0.069	0.021
Iron	mg/L	0.81	3.8	0.48
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	0.1618	1.097	0.848
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0077	< 0.0005	0.0015
Nickel	mg/L	0.0182	0.1699	0.1171
Selenium	mg/L	< 0.0005	0.0008	0.0029
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.006	0.172	0.135

Table 8.41: Whale Tail 2018 WRSF pond (ST-WT-3)

Parameters	Sample Date / Units	9/4/2018	9/18/2018
Conventional Parameters			
pH	pH units	6.67	7.01
Hardness	mg CaCO3/L	49	79
Total suspended solids	mg/L	87	7
Turbidity	NTU	424	18.9
Major Ions			
Alkalinity	mg CaCO3/L	12	17
Chloride	mg/L	4.7	28.2
Fluoride	mg/L	0.05	0.04
Sulphate	mg/L	26.8	49.1
Nutrients and Chlorophyll a			
Nitrate	mg/L	1.53	3.34
Nitrite	mg/L	0.01	0.01
Ammonia Nitrogen	mg/L	0.03	0.12
Total Metals			
Aluminum	mg/L	5.22	0.363
Arsenic	mg/L	0.0214	< 0.0005
Barium	mg/L	0.0651	0.0486
Cadmium	mg/L	< 0.00002	< 0.00002
Chromium	mg/L	0.0249	0.0021
Copper	mg/L	0.0147	0.0016
Iron	mg/L	9.71	0.72
Lead	mg/L	0.0062	< 0.0003
Manganese	mg/L	0.3318	0.0595
Mercury	mg/L	< 0.00001	< 0.00001
Molybdenum	mg/L	< 0.0005	0.002
Nickel	mg/L	0.0335	0.0151
Selenium	mg/L	< 0.0005	< 0.0005
Silver	mg/L	< 0.0001	< 0.0001
Thallium	mg/L	< 0.0002	< 0.0002
Zinc	mg/L	0.031	0.002

Table 8.42: Whale Tail 2018 Lake A47 (ST-WT-6)

Parameters	Sample Date / Units	8/30/2018
Field Measured		
pH	pH units	6.88
Conductivity	uS/cm	172.3
Temperature	°C	7.5
Turbidity	NTU	0.83
Dissolved oxygen	mg/L	10.79
Conventional Parameters		
pH	pH units	7.57
Specific conductivity	uS/cm	165
Hardness	mg CaCO3/L	70
Total dissolved solids	mg/L	110
Total suspended solids	mg/L	< 1
Total organic carbon	mg/L	5.4
Dissolved organic carbon	mg/L	5.2
Major Ions		
Alkalinity	mg CaCO3/L	23
Bicarbonate, as CaCO3	mg CaCO3/L	23
Carbonate, as CaCO3	mg CaCO3/L	< 2
Chloride	mg/L	24.1
Sulphate	mg/L	20.8
Silica	mg/L	0.71
Nutrients and Chlorophyll a		
Nitrate	mg/L	0.01
Nitrite	mg/L	<0.01
Ammonia Nitrogen	mg/L	0.01
Total Kjeldahl nitrogen	mg/L	0.35
Total phosphorus	mg/L	0.01
Orthophosphate	mg/L	0.01
Total Metals		
Aluminum	mg/L	0.015
Antimony	mg/L	< 0.0001
Arsenic	mg/L	< 0.0005
Barium	mg/L	0.0229
Beryllium	mg/L	< 0.0005
Boron	mg/L	< 0.01
Cadmium	mg/L	< 0.00002
Calcium	mg/L	20.7
Chromium	mg/L	< 0.0006
Copper	mg/L	0.0006
Iron	mg/L	0.18
Lead	mg/L	< 0.0003
Lithium	mg/L	< 0.005
Magnesium	mg/L	4.54

Manganese	mg/L	0.017
Mercury	mg/L	< 0.00001
Molybdenum	mg/L	0.0005
Nickel	mg/L	0.0044
Potassium	mg/L	2.05
Selenium	mg/L	0.0008
Sodium	mg/L	1.29
Strontium	mg/L	0.11
Thallium	mg/L	< 0.0002
Tin	mg/L	< 0.001
Titanium	mg/L	0.02
Uranium	mg/L	< 0.001
Vanadium	mg/L	< 0.0005
Zinc	mg/L	0.002
Dissolved Metals		
Aluminum	mg/L	< 0.005
Antimony	mg/L	< 0.0001
Arsenic	mg/L	< 0.0005
Barium	mg/L	0.019
Beryllium	mg/L	< 0.0005
Boron	mg/L	< 0.01
Cadmium	mg/L	< 0.00002
Chromium	mg/L	< 0.0006
Copper	mg/L	0.0009
Iron	mg/L	0.01
Lithium	mg/L	< 0.005
Manganese	mg/L	0.0007
Mercury	mg/L	< 0.00001
Molybdenum	mg/L	0.0007
Nickel	mg/L	0.004
Selenium	mg/L	0.0007
Strontium	mg/L	0.105
Thallium	mg/L	< 0.0002
Tin	mg/L	< 0.001
Titanium	mg/L	0.02
Uranium	mg/L	< 0.001
Vanadium	mg/L	< 0.0005
Zinc	mg/L	< 0.001

Table 8.43: Whale Tail 2018 Lake A16 (ST-WT-14)

Parameters	Sample Date / Units	8/31/2018
Field Measured		
pH	pH units	6.68
Conductivity	uS/cm	57.3
Temperature	°C	13.7
Turbidity	NTU	0.29
Dissolved oxygen	mg/L	10.42
Conventional Parameters		
pH	pH units	6.93
Specific conductivity	uS/cm	57
Hardness	mg CaCO3/L	19
Total dissolved solids	mg/L	38
Total suspended solids	mg/L	< 1
Total organic carbon	mg/L	1.2
Dissolved organic carbon	mg/L	1.1
Major Ions		
Alkalinity	mg CaCO3/L	7
Bicarbonate	mg CaCO3/L	7
Carbonate	mg CaCO3/L	< 2
Chloride	mg/L	10.8
Sulphate	mg/L	4.3
Silica	mg/L	0.55
Nutrients and Chlorophyll a		
Nitrate	mg/L	0.01
Nitrite	mg/L	<0.01
Ammonia Nitrogen	mg/L	< 0.01
Total Kjeldahl nitrogen	mg/L	0.11
Total phosphorus	mg/L	0.01
Orthophosphate	mg/L	<0.01
Total Metals		
Aluminum	mg/L	< 0.005
Antimony	mg/L	< 0.0001
Arsenic	mg/L	< 0.0005
Barium	mg/L	0.0093
Beryllium	mg/L	< 0.0005
Boron	mg/L	< 0.01
Cadmium	mg/L	< 0.00002
Calcium	mg/L	5.65
Chromium	mg/L	< 0.0006
Copper	mg/L	< 0.0005
Iron	mg/L	0.01
Lead	mg/L	< 0.0003
Lithium	mg/L	< 0.005
Magnesium	mg/L	1.31

Manganese	mg/L	0.0007
Mercury	mg/L	< 0.00001
Molybdenum	mg/L	< 0.0005
Nickel	mg/L	0.0012
Potassium	mg/L	0.71
Selenium	mg/L	< 0.0005
Sodium	mg/L	0.68
Strontium	mg/L	0.05
Thallium	mg/L	< 0.0002
Tin	mg/L	< 0.001
Titanium	mg/L	< 0.01
Uranium	mg/L	< 0.001
Vanadium	mg/L	< 0.0005
Zinc	mg/L	< 0.001
Dissolved Metals		
Aluminum	mg/L	< 0.005
Antimony	mg/L	< 0.0001
Arsenic	mg/L	< 0.0005
Barium	mg/L	0.0093
Beryllium	mg/L	< 0.0005
Boron	mg/L	< 0.01
Cadmium	mg/L	< 0.00002
Chromium	mg/L	< 0.0006
Copper	mg/L	0.0018
Iron	mg/L	< 0.01
Lithium	mg/L	< 0.005
Manganese	mg/L	< 0.0005
Mercury	mg/L	< 0.00001
Molybdenum	mg/L	< 0.0005
Nickel	mg/L	< 0.0005
Selenium	mg/L	< 0.0005
Strontium	mg/L	< 0.005
Thallium	mg/L	< 0.0002
Tin	mg/L	< 0.001
Titanium	mg/L	< 0.01
Uranium	mg/L	< 0.001
Vanadium	mg/L	< 0.0005
Zinc	mg/L	< 0.001

Table 8.44: Whale Tail 2018 Lake 15 (ST-WT-15)

Parameters	Sample Date / Units	8/31/2018
Field Measured		
pH	pH units	6.75
Conductivity	uS/cm	57.9
Temperature	°C	10
Turbidity	NTU	0
Dissolved oxygen	mg/L	10.83
Conventional Parameters		
pH	pH units	5.7
Specific conductivity	uS/cm	58
Hardness	mg CaCO3/L	20
Total dissolved solids	mg/L	39
Total suspended solids	mg/L	1
Total organic carbon	mg/L	1.5
Dissolved organic carbon	mg/L	1.5
Major Ions		
Alkalinity	mg CaCO3/L	7
Bicarbonate	mg CaCO3/L	7
Carbonate	mg CaCO3/L	< 2
Chloride	mg/L	10.9
Sulphate	mg/L	2.8
Silica	mg/L	0.59
Nutrients and Chlorophyll a		
Nitrate	mg/L	0.04
Nitrite	mg/L	<0.01
Ammonia Nitrogen	mg/L	0.02
Total Kjeldahl nitrogen	mg/L	0.07
Orthophosphate	mg/L	< 0.01
Total phosphorus	mg/L	< 0.01
Total Metals		
Aluminum	mg/L	< 0.005
Antimony	mg/L	< 0.0001
Arsenic	mg/L	< 0.0005
Barium	mg/L	0.0081
Beryllium	mg/L	< 0.0005
Boron	mg/L	< 0.01
Cadmium	mg/L	< 0.00002
Calcium	mg/L	5.85
Chromium	mg/L	< 0.0006
Copper	mg/L	< 0.0005
Iron	mg/L	< 0.01
Lead	mg/L	< 0.0003
Lithium	mg/L	< 0.005
Magnesium	mg/L	1.44

Manganese	mg/L	< 0.0005
Mercury	mg/L	< 0.00001
Molybdenum	mg/L	< 0.0005
Nickel	mg/L	0.0009
Potassium	mg/L	0.71
Selenium	mg/L	< 0.0005
Sodium	mg/L	0.73
Strontium	mg/L	0.049
Thallium	mg/L	< 0.0002
Tin	mg/L	< 0.001
Titanium	mg/L	< 0.01
Uranium	mg/L	< 0.001
Vanadium	mg/L	< 0.0005
Zinc	mg/L	< 0.001
Dissolved Metals		
Aluminum	mg/L	< 0.005
Antimony	mg/L	< 0.0001
Arsenic	mg/L	< 0.0005
Barium	mg/L	0.0083
Beryllium	mg/L	< 0.0005
Boron	mg/L	< 0.01
Cadmium	mg/L	< 0.00002
Chromium	mg/L	0.0007
Copper	mg/L	0.0007
Iron	mg/L	< 0.01
Lithium	mg/L	< 0.005
Manganese	mg/L	< 0.0005
Mercury	mg/L	< 0.00001
Molybdenum	mg/L	< 0.0005
Nickel	mg/L	0.001
Selenium	mg/L	< 0.0005
Strontium	mg/L	0.047
Thallium	mg/L	< 0.0002
Tin	mg/L	< 0.001
Titanium	mg/L	< 0.01
Uranium	mg/L	< 0.001
Vanadium	mg/L	< 0.0005
Zinc	mg/L	0.001

Table 8.45: Whale Tail 2018 AP5 discharge (MEA-4)

			Sample Date									
Parameters	**Max Grab**	**Max Mean**	**Units**	**2018-09-04 Pre-discharge sample**	**9/16/2018**	**9/24/2018**	**2018-10-01 Pre-disharge sample**	**10/8/2018**	**10/11/2018**	**10/15/2018**	**10/29/2018**	**11/5/2018**
Field Measured												
pH	6.0 - 9.5	6.0 - 9.5	pH units	-	7.17	6.36	6.38	7.07	6.63	7.12	6.99	6.97
Conventional Parameters												
Total dissolved solids	1400	1400	mg/L	678	823	1327	328	227	427	335	182	192
Total suspended solids	50	25	mg/L	20	5	7	10	20	9	3	19	17
Major Ions												
Chloride	2000	1000	mg/L	303	398	897	154	92.2	254	159	45.4	69
Nutrients and Chlorophyll a												
Ammonia Nitrogen	32	16	mg/L	2.26	2.88	4.36	0.89	1.01	1.33	1.02	4.81	2.4
General Organics												
Total oil and grease			mg/L	<1	<1	<1	<1	<1	1	<1	<1	< 1
Total Metals												
Arsenic	1.0	0.5	mg/L	0.0059	0.0013	0.0054	0.004	0.005	0.0042	< 0.0005	< 0.0005	0.0077
Lead	0.4	0.2	mg/L	< 0.0003	< 0.0003	< 0.0003	0.0008	0.0022	0.0013	< 0.0003	< 0.0003	0.004
Nickel	1.0	0.5	mg/L	0.0234	0.0282	0.0527	0.0084	0.0067	-	0.0079	0.0118	0.0091
Zinc	1.0	0.5	mg/L	0.009	0.004	0.002	0.003	0.008	0.004	< 0.001	0.003	0.003

Table 8.46: Whale Tail 2018 Exploration drilling monitoring

Date	Location	Station	Field DO	Cond	Hardness	pH	Temperature	Tss	Turb.	Cl	Al	Sb	Ag	As	Ba	Be	B	Cd	Ca	Cr	Cu	Sn	Fe	Li	Mg	Mn	Hg	Mo	Ni	Pb	K	Se	Na	SO4 (Sulphate)	Sr	Ti	U	V	Zn
			mg/L	uS/cm	mg CaCO3/L	pH units	°C	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
2018-02-12	Whale Tail Lake	WT1		66	22	6.6		<1	1.41	12.4	<0.006	<0.0001	<0.0001	<0.0005		<0.0005	<0.01	<0.00002	6.25	<0.0006	<0.0005	<0.001	<0.01	<0.005	1.72	0.0021	<0.00001	<0.0005	0.0013	0.001	0.74	<0.001	0.96	2.6	0.056	<0.01	<0.001	<0.0005	<0.001
2018-02-18	Whale Tail Lake	WT1		66	18	6.55	2.1	1	0.48	13.8	0.068	<0.0001	<0.0001	<0.0005	0.011	<0.0005	<0.01	<0.00002	5.27	<0.0006	<0.0005	<0.001	<0.01	<0.005	1.3	0.0015	0.00005	<0.0005	0.0009	<0.0003	0.58	<0.001	0.72	1.3	0.051	<0.01	<0.001	<0.0005	<0.001
2018-02-26	Whale Tail Lake	WT1	14.33	75	23	6.87	1.8	1	0.74	14	0.029	<0.0001	0.0001	<0.0005	0.0144	<0.0005	<0.01	<0.00002	6.95	<0.0006	<0.0005	<0.001	0.021	0.005	1.51	0.0053	<0.00001	<0.0005	<0.0005	<0.0003	0.81	<0.001	0.86	2	0.063	<0.01	<0.001	<0.0005	<0.001
2018-03-06	Whale Tail Lake	WT1		71	19	6.49		<1	0.53	14.3	<0.006	<0.0001	<0.0001	<0.0005	0.0124	<0.0005	<0.01	<0.00002	5.29	<0.0006	<0.0005	<0.001	<0.010	<0.005	1.56	0.0014	<0.00001	<0.0005	<0.0005	<0.0003	0.71	<0.001	0.88	1.6	0.041	<0.01	<0.001	<0.0005	<0.001
2018-03-11	Whale Tail Lake	WT1		71	24	6.66		<1	0.59	15.4	<0.006	<0.0001	<0.0001	<0.0005	0.0117	<0.0005	<0.01	<0.00002	7.15	<0.0006	<0.0005	<0.001	0.011	<0.005	1.62	0.0023	<0.00001	<0.0005	0.0009	<0.0003	0.81	<0.001	0.91	1.8	0.06	<0.01	<0.001	<0.0005	<0.001
2018-03-18	Whale Tail Lake	WT1	16.98	74	25	6.38	2.5	<1	0.73	13.5	0.016	0.0004	<0.0001	<0.0005	0.0137	<0.0005	<0.01	0.00002	7.09	0.0045	0.0235	<0.001	0.014	<0.005	1.8	0.0028	<0.00001	<0.0005	0.0016	0.0032	0.95	<0.001	1.19	1.6	0.055	<0.01	<0.001	<0.0005	0.009
2018-03-26	Whale Tail Lake	WT1	17.82				1.1																																
2018-04-22	Whale Tail Lake	WT1	16.1	70	21	6.51	1.8	1	0.38	12.7	<0.006	<0.0001	<0.0001	<0.0005	0.0108	<0.0005	<0.01	<0.00002	6.07	<0.0006	<0.0005	<0.001	<0.01	<0.005	1.65	0.0017	<0.00001	<0.0005	0.0006	<0.0003	0.78	<0.001	0.94	2.2	0.052	<0.01	<0.001	<0.0005	<0.001
2018-05-08	Whale Tail Lake	WT1					0.1																																
2018-05-13	Whale Tail Lake	WT1		66	27	6.65	2.4	<1		13.8	<0.006	<0.0001	<0.0001	<0.0005	0.0118	<0.0005	<0.01	<0.00002	8.16	0.0007	0.0018	<0.001	<0.01	<0.005	1.79	0.0019	<0.00001	<0.0005	0.0018	<0.0003	0.89	<0.001	1.15	5.2	0.059	<0.01	<0.001	<0.0005	<0.001
2018-05-20	Whale Tail Lake	WT1		67	27	6.65		<1	0.18	13.6	0.023	<0.0001	<0.0001	<0.0005	0.0131	<0.0005	<0.01	<0.00002	7.99	<0.0006	<0.0005	<0.001	<0.01	<0.005	1.82	0.0016	<0.00001	<0.0005	0.001	<0.0003	0.9	<0.001	1.08	4.3	0.06	<0.01	<0.001	<0.0005	<0.001
2018-02-12	Whale Tail Lake	WT2		66	22	6.6		1	0.48	12.4	<0.006	<0.0001	<0.0001	<0.0005		<0.0005	<0.01	<0.00002	6.24	<0.0006	<0.0005	<0.001	0.01	<0.005	1.72	0.0018	<0.00001	<0.0005	0.0011	<0.0003	0.73	<0.001	0.93	2.8	0.059	<0.01	<0.001	<0.0005	<0.001
2018-02-18	Whale Tail Lake	WT2		64	17	6.5	2	2	0.47	13.6	0.017	<0.0001	<0.0001	<0.0005	0.0097	<0.0005	<0.01	<0.00002	5.02	<0.0006	<0.0005	<0.001	0.01	<0.005	1.27	0.0016	0.00002	<0.0005	0.0009	<0.0003	0.56	<0.001	0.71	1.8	0.049	<0.01	<0.001	<0.0005	<0.001
2018-02-26	Whale Tail Lake	WT2	13.07	66	21	6.74	2	1	0.48	12.4	<0.006	<0.0001	<0.0001	<0.0005	0.0142	<0.0005	<0.01	<0.00002	6.42	<0.0006	<0.0005	<0.001	<0.010	<0.005	1.22	0.002	<0.00001	<0.0005	<0.0005	<0.0003	0.63	<0.001	0.68	1.2	0.055	<0.01	<0.001	<0.0005	<0.001
2018-03-06	Whale Tail Lake	WT2		67	28	6.51		<1	0.54	13.6	0.01	<0.0001	<0.0001	<0.0005	0.0124	<0.0005	<0.01	<0.00002	8.58	<0.0006	<0.0005	<0.001	<0.010	<0.005	1.81	0.0015	<0.00001	<0.0005	0.0006	<0.0003	0.77	<0.001	0.99	1.4	0.067	<0.01	<0.001	<0.0005	<0.001
2018-03-11	Whale Tail Lake	WT2		68	21	6.72		<1	0.52	14.9	<0.006	<0.0001	<0.0001	<0.0005	0.0123	<0.0005	<0.01	<0.00002	6.41	<0.0006	<0.0005	<0.001	<0.010	<0.005	1.46	0.002	<0.00001	<0.0005	0.0008	<0.0003	0.79	<0.001	0.82	1.6	0.055	<0.01	0.001	0.0005	0.001
2018-03-18	Whale Tail Lake	WT2	15.78	68	24	6.41	2.5	<1	0.67	12.5	0.072	0.0004	<0.0001	<0.0005	0.0135	<0.0005	<0.01	0.00002	6.84	0.0055	0.003	<0.001	0.014	<0.005	1.7	0.0024	<0.00001	<0.0005	0.0009	0.0008	0.85	<0.001	1	1.6	0.051	<0.01	<0.001	<0.0005	0.007
2018-03-26	Whale Tail Lake	WT2	16.9				1																																
2018-04-02	Whale Tail Lake	WT2		71	20	6.48		11	0.99	15	<0.006	0.0014	<0.0001	<0.0005	0.0108	<0.0005	<0.01	<0.00002	6.02	0.0044	<0.0005	<0.001	<0.01	<0.005	1.39	0.0019	<0.00001	<0.0005	0.0009	<0.0003	0.76	<0.001	0.77	2.3	0.062		<0.001	<0.0005	0.001
2018-04-22	Whale Tail Lake	WT2	16.05	73	23	6.56	1.2	<1	0.61	13.3	<0.006	<0.0001	<0.0001	<0.0005	0.0111	<0.0005	<0.01	<0.00002	6.5	<0.0006	<0.0005	<0.001	<0.01	<0.005	1.76	0.0019	<0.00001	<0.0005	0.0007	<0.0003	0.86	<0.001	0.99	3.2	0.054	<0.01	<0.001	<0.0005	<0.001
2018-05-08	Whale Tail Lake	WT2					0.1																																
2018-05-13	Whale Tail Lake	WT2		71	18	6.7	2.3	2		14.3	<0.006	<0.0001	0.0005	0.0043	0.0132	0.001	<0.01	0.00009	5.4	0.0012	<0.0005	<0.001	0.01	<0.005	1.3	0.0019	<0.00001	<0.0005	0.0013	0.0007	0.87	<0.001	0.78	3.9	0.069	<0.01	<0.001	<0.0005	0.004
2018-05-20	Whale Tail Lake	WT2		67	26	6.53		<1	<0.12	13.7	0.016	<0.0001	<0.0001	<0.0005	0.0148	<0.0005	<0.01	<0.00002	7.78	<0.0006	<0.0005	<0.001	<0.01	<0.005	1.78	0.002	<0.00001	<0.0005	0.0011	<0.0003	0.83	<0.001	1.02	3.9	0.065	<0.01	<0.001	<0.0005	<0.001
2018-05-28	Whale Tail Lake	WT2		76	28	6.57		1	<0.12	13.8	0.009	<0.0001	<0.0001	<0.0005	0.015	<0.0005	<0.01	<0.00002	7.53	<0.0006	<0.0005	<0.001	<0.01	0.011	2.12	0.0011	<0.00001	<0.0005	0.0011	<0.0003	0.85	<0.001	1.38	1.8	0.065	<0.01	<0.001	<0.0005	0.001
2018-02-12	Whale Tail Lake	WT3		78	28	6.58		<1	0.81	14.6	<0.006	<0.0001	<0.0001	<0.0005		<0.0005	<0.01	<0.00002	7.88	<0.0006	<0.0005	<0.001	0.01	<0.005	2.18	0.0053	<0.00001	<0.0005	0.0018	<0.0003	0.86	<0.001	1.12	3.8	0.069	<0.01	<0.001	<0.0005	<0.001
2018-02-18	Whale Tail Lake	WT3		79	25	6.46	1.7	4	1.27	16.3	<0.006	<0.0001	<0.0001	<0.0005	0.0123	<0.0005	<0.01	<0.00002	7.17	<0.0006	0.0006	<0.001	0.01	<0.005	1.75	0.0056	0.00003	<0.0005	0.0018	<0.0003	0.73	<0.001	0.96	2.3	0.066	<0.01	<0.001	<0.0005	0.004
2018-02-26	Whale Tail Lake	WT3	14.03	93	31	6.5	2.1	6	0.58	17.3	<0.006	<0.0001	<0.0001	<0.0005	0.0193	<0.0005	<0.01	<0.00002	9.55	<0.0006	<0.0005	<0.001	0.03	<0.005	1.74	0.0126	0.00001	<0.0005	0.001	<0.0003	0.84	<0.001	0.9	2.4	0.08	<0.01	<0.001	<0.0005	<0.001
2018-03-06	Whale Tail Lake	WT3		96	33	6.44		<1	0.58	19.4	0.011	<0.0001	<0.0001	<0.0005	0.0171	<0.0005	<0.01	<0.00002	9.88	<0.0006	<0.0005	<0.001	0.015	<0.005	2.24	0.0135	<0.00001	<0.0005	0.0012	<0.0003	0.93	<0.001	1.14	5.4	0.076	<0.01	<0.001	<0.0005	<0.001
2018-03-11	Whale Tail Lake	WT3		97	32	6.7		<1	0.54	19.8	<0.006	<0.0001	<0.0001	<0.0005	0.0179	<0.0005	<0.01	<0.00002	9.54	<0.0006	0.0016	<0.001	0.024	<0.005	2.19	0.0182	<0.00001	<0.0005	0.0026	0.0271	1.07	<0.001	1.19	3.8	0.082	<0.01	<0.001	<0.0005	0.03
2018-03-18	Whale Tail Lake	WT3	16.44	100	37	6.33	2.1	1	0.58	18.3	0.011	0.0001	<0.0001	<0.0005	0.0178	<0.0005	<0.01	<0.00002	10.5	0.0057	0.0469	<0.001	0.043	<0.005	0.02	0.0005	0.00001	0.0005	0.0005	0.0003	0.05	0.001	0.05	0.6	0.005	0.01	0.001	0.0005	0.001
2018-03-26	Whale Tail Lake	WT3	17.51				1.6																																
2018-04-02	Whale Tail Lake	WT3		101	31	6.38		12	0.97	21	<0.006	0.0013	<0.0001	<0.0005	0.0167	<0.0005	<0.01	0.00003	8.96	0.0049	0.0008	<0.001	0.01	<0.005	2.18	0.0191	<0.00001	<0.0005	0.0022	<0.0003	1.1	<0.001	1.17	6.3	0.081		<0.001	<0.0005	0.003
2018-05-08	Whale Tail Lake	WT3					0.1																																
2018-05-13	Whale Tail Lake	WT3		66	30	6.62	1.8	1		21.6	0.008	<0.0001	<0.0001	0.0049	0.0215	0.0018	<0.01	0.00008	8.94	0.001	<0.0005	<0.001	0.04	<0.005	2.06	0.0144	<0.00001	<0.0005	0.0023	0.0115	1.22	<0.001	1.1	5.1	0.105	<0.01	<0.001	<0.0005	0.005
2018-05-20	Whale Tail Lake	WT3		101	48	6.64		<1	<0.12	22	0.021	<0.0001	<0.0001	0.0006	0.0248	<0.0005	<0.01	<0.00005	14.6	<0.0006	<0.0005	<0.001	<0.01	<0.005	2.95	0.0149	<0.00001	<0.0005	0.003	0.0026	1.3	<0.001	2.36	5.8	0.12	<0.01	<0.001	<0.0005	<0.001
2018-05-28	Whale Tail Lake	WT3		113	38	6.43		<1	<0.12	20.6	<0.006	<0.0001	<0.0001	<0.0005	0.0228	<0.0005	<0.01	<0.00002	10.4	<0.0006	<0.0005	<0.001	<0.01	0.009	2.95	0.0066	<0.00001	<0.0005	0.0023	<0.0003	1.03	<0.001	1.72	6.8	0.12	<0.01	<0.001	<0.0005	0.001
2018-02-26	Whale Tail Lake	WT4	13.29	70	22	6.5	2.1	6	0.47	13.5	<0.006	<0.0001	<0.0001	<0.0005	0.0172	<0.0005	<0.01	<0.00002	6.61	<0.0006	<0.0005	<0.001	<0.010	<0.005	1.47	0.0019	<0.00001	<0.0005	<0.0005	<0.0003	0.8	<0.001	0.83	<0.6	0.059	<0.01	<0.001	<0.0005	<0.001
2018-03-11	Whale Tail Lake	WT4		67	22	6.68		<1	0.6	14	<0.006	<0.0001	<0.0001	<0.0005	0.0113	<0.0005	<0.01	0.00002	6.47	<0.0006	<0.0005	<0.001	<0.010	<0.005	1.5	0.0019	<0.00001	<0.0005	0.001	<0.0003	0.77	<0.001	0.84	1.1	0.054	<0.01	<0.001	<0.0005	0.002
2018-03-18	Whale Tail Lake	WT4	15.27	72	23	7.09	2.2	<1	0.56	13.2	0.011	0.0002	<0.0001	<0.0005	0.0137	<0.0005	<0.01	<0.00002	6.82	0.0048	0.0064	<0.001	<0.010	<0.005	1.67	0.002	<0.00001	<0.0005	0.0012	<0.0003	0.86	<0.001	0.99	1.9	0.054	<0.01	<0.001	<0.0005	0.008
2018-03-26	Whale Tail Lake	WT4	17.33				1.5																																
2018-04-02	Whale Tail Lake	WT4		68	20	6.51		<1	0.99	13.9	<0.006	0.0009	<0.0001	<0.0005	0.0108	<0.0005	<0.01	<0.00002	5.93	0.004	0.0005	<0.001	<0.01	<0.005	1.36	0.0017	<0.00001	<0.0005	0.0009	<0.0003	0.76	<0.001	0.79	3.5	0.059		<0.001	<0.0005	0.001
2018-04-22	Whale Tail Lake	WT4	15.69	71	21	6.59	1.7	2	0.53	12.8	0.006	<0.0001	<0.0001	<0.0005	0.0102	<0.0005	<0.01	<0.00002	6.02	<0.0006	<0.0005	<0.001	0.01	<0.005	1.66	0.0024	<0.00001	<0.0005	0.0006	0.1396	0.76	<0.001	0.95	2.2	0.052	<0.01	<0.001	<0.0005	0.001
2018-05-08	Whale Tail Lake	WT4					0.1																																
2018-05-13	Whale Tail Lake	WT4		68	17	6.58	2.4	<1		13.2	<0.006	<0.0001	<0.0001	0.0034	0.0122	<0.0005	<0.01	0.00005	5.05	<0.0006	0.0005	<0.001	0.01	<0.005	1.24	0.0017	<0.00001	<0.0005	0.0011	0.0007	0.73	<0.001	0.72	3.1	0.063	<0.01	<0.001	<0.0005	0.004
2018-05-20	Whale Tail Lake	WT4		66	26	6.62		<1	<0.12	13.1	0.042	<0.0001	<0.0001	<0.0005	0.0129	<0.0005	<0.01	<0.00002	7.95	<0.0006	<0.0005	<0.001	<0.01	<0.005	1.73	0.0012	0.00004	<0.0005	0.0012	0.0021	0.84	<0.001	1.01	2.6	0.066	<0.01	<0.001	<0.0005	<0.001
2018-02-26	Whale Tail Lake	WT5	13.09	66	21	6.43	2	<1	0.69	12.4	<0.006	<0.0001	<0.0001	<0.0005	0.0141	<0.0005	<0.01	<0.00002	6.29	<0.0006	0.0007	<0.001	<0.010	<0.005	1.39	0.0015	<0.00001	<0.0005	<0.0005	<0.0003	0.72	<0.001	0.79	0.8	0.055	<0.01	<0.001	<0.0005	<0.001
2018-03-11	Whale Tail Lake	WT5		71	23	6.7		<1	0.56	14.7	<0.006	<0.0001	<0.0001	<0.0005	0.014	<0.0005	<0.01	<0.00002	6.85	<0.0006	<0.0005	<0.001	<0.010	<0.005	1.6	0.0021	<0.00001	<0.0005	0.0011	<0.0003	0.82	<0.001	0.92	2.1	0.056	<0.01	<0.001	<0.0005	0.002
2018-03-18	Whale Tail Lake	WT5	14.91	73	70	6.58	2	<1	0.45	13.3	0.014	0.0003	<0.0001	0.0017	0.0153	<0.0005	<0.01	<0.00002	23.4	0.0067	0.0059	<0.001	0.012	<0.005	2.9	0.0025	<0.00001	0.0005	0.0043	<0.0003	2.56	0.004	20.4	4.4	0.053	0.03	<0.001	<0.0005	0.008
2018-03-26	Whale Tail Lake	WT5	19.33				1.4																																
2018-04-02	Whale Tail Lake	WT5		75	23	6.55		22	0.84	15.8	0.01	0.0009	<0.0001	<0.0005	0.0127	<0.0005	<0.01	0.00003	6.85	0.005	0.0007	<0.001	0.01	<0.005	1.61	0.0021	<0.00001	<0.0005	0.0012	<0.0003	0.88	<0.001	0.93	3	0.058		<0.001	<0.0005	0.003
2018-04-22	Whale Tail Lake	WT5	15.41	75	23	6.86	1.7	<1	0.48	13.2	<0.006	<0.0001	<0.0001	<0.0005	0.0105	<0.0005	<0.01	<0.00002	6.43	<0.0006	<0.0005	<0.001	<0.01	<0.005	1.78	0.0016	<0.00001	<0.0005	0.0006	<0.0003	0.85	<0.001	1.02	2.5	0.055	<0.01	<0.001	<0.0005	<0.001
2018-05-13	Whale Tail Lake	WT5		67	19	6.73	2.6	2		13.6	0.006	<0.0001	<0.0001	0.0031	0.0133	<0.0005	<0.01	0.0001	5.49	0.0013	<0.0005	<0.001	<0.01	<0.005	1.34	0.0018	0.00001	<0.0005	0.0013	0.0031	0.82	<0.001	0.79	3.1	0.059	<0.01	<0.001	<0.0005	0.006
2018-05-20	Whale Tail Lake	WT5		68	27	7.27		<1	<0.12	13.7	0.018	<0.0001	<0.0001	<0.0005	0.0119	<0.0005	<0.01	<0.00002	8.16	<0.0006	<0.0005	<0.001	<0.01	<0.005	1.82	0.0018	<0.00001	<0.0005	0.0016	<0.0003	0.88	<0.001	1.07	2.7	0.062	<0.01	<0.001	<0.0005	<0.001
2018-04-12	A47	frozen to the bottom																																					
2018-04-07	A49	A49-1		266	86	6.41		<1	0.69	30.6	<0.006	<0.0001	0.0068	0.0005	0.0106	<0.0005	<0.01	<0.00002	27.7	0.0006	0.002079	<0.001	0.01	<0.005	4.23	0.1238	<0.00001	<0.0005	0.0161	<0.0003	1.71	<0.001	0.95	60.1	0.103	0.03	<0.001	<0.0005	<0.001
2018-04-07	A49	D-1		268	90	6.39		<1	0.75	30.8	<0.006	<0.0001	0.002	<0.0005	0.0111	<0.0005	<0.01	<0.00002	29	<0.0006	0.002161	<0.001	0.03	<0.005	4.34	0.1312	<0.00001	<0.0005	0.0153	<0.0003	1.8	<0.001	1.02	58.7	0.101	0.03	<0.001	<0.0005	<0.001

Table 8.47: Meadowbank 2018 Sewage Treatment Plant Water Quality Monitoring

STP-IN Parameters	Sample Date Units	1/8/2018	2/5/2018	3/6/2018	4/2/2018	5/8/2018	6/12/2018	7/9/2018	8/8/2018	9/3/2018	10/3/2018	10/17/2018	11/6/2018	12/11/2018
pH, field measured	pH units	7.2	7.1	7.5	7.3	8.2	-	7	7.4	7.6	-	-	8.2	8.4
Total Suspended Solids	mg/L	97	126	138	151	338	31	811	23	32	85	-	103	165
Ammonia Nitrogen	mg N/L	78.7	92.7	62.9	83.7	99.5	81.4	79.5	79.4	82.8	86	-	83	99.5
Ammonia Nitrogen as NH3	mg N/L	0.76	1.41	0.69	2.24	0.04	0.78	0.65	0.44	0.63	1.53	-	1.18	1.32
Nitrogen, Kjeldahl	mg N/L	104	111	83.3	101	115	102	98.9	105	88.2	99.5	-	108	115
Nitrate	mg N/L	0.06	0.06	0.02	0.29	0.39	0.04	0.01	0.04	0.06	0.03	-	0.03	0.04
Nitrite	mg N/L	0.03	0.02	0.01	< 0.01	< 0.01	< 0.01	0.02	0.02	0.02	0.03	-	0.03	0.02
Phosphorus	mg/L	8.65	11.4	9.38	8.6	12.3	6.92	8.63	9.21	8.08	6.38	-	12.8	na
Biochemical Oxygen Demand, 5 Day	mg/L	176	296	94	278	227	69	232	47	65	224	-	210	299
Chemical Oxygen Demand	mg/L	480	579	486	650	481	261	420	1470	285	532	-	470	592
Fecal Coliforms	CFU/100mL	5300000	2400000	3400000	4900000	10000000	2200000	4 000 000	1 900 000	250000	-	2 100 000	5 100 000	6000000
Total Coliform	CFU/100mL	-	70000000	65000000	56000000	33000000	18000000	70 000 000	23 000 000	2,500,000	-	-	28 000 000	45000000
Atypical colonies	CFU/100mL	>200000000	29000000	40000000	15000000	41000000	27000000	48 000 000	5 000 000	4,500,000	-	< 2000000	34 000 000	38000000

LJ MIX Parameters	Sample Date Units	1/8/2018	2/5/2018	3/6/2018	4/2/2018	5/8/2018	6/12/2018	7/9/2018	8/8/2018	9/3/2018	10/3/2018	10/17/2018	11/6/2018	12/11/2018
pH, field measured	pH units	6	7	6.9	7	6.8	-	-	-	6.8	-	-	6.7	7.1
Total Suspended Solids	mg/L	12	36	25	86	2	10	22	37	14	9	-	30	10
Ammonia Nitrogen	mg N/L	12.8	4.34	0.84	10.8	3.9	19.8	48.8	19	9.44	19.7	-	10.5	10.9
Ammonia Nitrogen as NH3	mg N/L	0.01	< 0.01	< 0.01	0.01	0.02	0.15	0.54	-	< 0.01	0.2	-	0.03	0.06
Nitrogen, Kjeldahl	mg N/L	17.4	10.6	5.33	17.3	6.02	24.8	56.4	21.5	11.5	23.2	-	16.2	12.9
Nitrate	mg N/L	16.8	15.8	19	21	21.8	11.5	4.85	-	19.5	13.4	-	12.7	11.1
Nitrite	mg N/L	0.26	0.65	0.16	0.22	0.23	0.35	0.95	-	0.22	0.42	-	0.68	0.57
Biochemical Oxygen Demand, 5 Day	mg/L	11	43	16	17	8	15	14	9	12	15	-	9	4
Chemical Oxygen Demand	mg/L	61	93	94	105	44	74	86	42	53	66	-	55	65
Fecal Coliforms	CFU/100mL	< 100	2400	3100	6100	1000	1600	490	800	40	-	900	1 400	3100
Total Coliform	CFU/100mL	6000	210000	60000	57000	35000	40000	4 000	15 000	< 100000	-	18 000	13 000	23000
Atypical colonies	CFU/100mL	66000	140000	20000	42000	< 1000	750000	17 000	7 000	1,400,000	-	18 000	3 000	8000

STP-OUT Parameters	Sample Date Units	1/8/2018	2/5/2018	3/6/2018	4/2/2018	5/8/2018	6/12/2018	7/9/2018	8/8/2018	9/3/2018	10/3/2018	10/17/2018	11/6/2018	12/11/2018
pH, field measured	pH units	6.9	6.8	7.1	7.2	7.4	-	6.8	6.5	7.3	-	-	7.4	7.4
Total Suspended Solids	mg/L	4	30	22	20	8	8	19	6	15	10	-	19	18
Ammonia Nitrogen	mg N/L	40.9	15.5	22.3	29.9	33.7	29.3	28.1	35.4	45.2	37.4	-	24	27.3
Ammonia Nitrogen as NH3	mg N/L	0.55	0.18	0.23	0.33	0.31	0.41	0.14	0.32	0.61	0.55	-	0.31	0.33
Nitrogen, Kjeldahl	mg N/L	50	23.7	25.5	36.4	37.8	41.6	34.3	41.6	45.9	42.7	-	33.8	31.9
Nitrate	mg N/L	7.52	9.43	6.74	9.5	7.22	4.17	10	5.81	4.5	6.78	-	7.24	6.61
Nitrite	mg N/L	1.24	0.56	1.51	1.1	1.09	0.92	0.71	1.04	1.15	1.08	-	1.29	1.14
Biochemical Oxygen Demand, 5 Day	mg/L	9	45	8	21	13	14	12	16	14	7	-	11	16
Chemical Oxygen Demand	mg/L	66	94	80	80	67	67	67	63	73	95	-	65	76
Fecal Coliforms	CFU/100mL	30	220	160	230	80	190	140	109	800	-	320	190	52
Total Coliform	CFU/100mL	< 1000	9000	< 10000	< 10000	2000	6000	6000	20000	< 10000	-	12 000	1 200	35000
Atypical colonies	CFU/100mL	70000	84000	840000	260000	62000	65000	32000	44000	180000	-	20 000	12 800	< 1000

Table 8.47: Meadowbank 2018 Sewage Treatment Plant Water Quality Monitoring

STP-IN Parameters	Sample Date Units	2018-01-08	2018-02-05	2018-03-06	2018-04-02	2018-05-08	2018-06-12	2018-07-09	2018-08-08	2018-09-03	2018-10-03	2018-10-17	2018-11-06	2018-12-11
pH, field measured	pH units	7.2	7.1	7.5	7.3	8.2	-	7	7.4	7.6	-	-	8.2	8.4
Total Suspended Solids	mg/L	97	126	138	151	338	31	811	23	32	85	-	103	165
Ammonia Nitrogen	mg N/L	78.7	92.7	62.9	83.7	99.5	81.4	79.5	79.4	82.8	86	-	83	99.5
Ammonia Nitrogen as NH3	mg N/L	0.76	1.41	0.69	2.24	0.04	0.78	0.65	0.44	0.63	1.53	-	1.18	1.32
Nitrogen, Kjeldahl	mg N/L	104	111	83.3	101	115	102	98.9	105	88.2	99.5	-	108	115
Nitrate	mg N/L	0.06	0.06	0.02	0.29	0.39	0.04	0.01	0.04	0.06	0.03	-	0.03	0.04
Nitrite	mg N/L	0.03	0.02	0.01	< 0.01	< 0.01	< 0.01	0.02	0.02	0.02	0.03	-	0.03	0.02
Phosphorus	mg/L	8.65	11.4	9.38	8.6	12.3	6.92	8.63	9.21	8.08	6.38	-	12.8	na
Biochemical Oxygen Demand, 5 Day	mg/L	176	296	94	278	227	69	232	47	65	224	-	210	299
Chemical Oxygen Demand	mg/L	480	579	486	650	481	261	420	1470	285	532	-	470	592
Fecal Coliforms	CFU/100mL	5300000	2400000	3400000	4900000	10000000	2200000	4 000 000	1 900 000	250000	-	2 100 000	5 100 000	6000000
Total Coliform	CFU/100mL	-	70000000	65000000	56000000	33000000	18000000	70 000 000	23 000 000	2,500,000	-	-	28 000 000	45000000
Atypical colonies	CFU/100mL	>200000000	29000000	40000000	15000000	41000000	27000000	48 000 000	5 000 000	4,500,000	-	< 2000000	34 000 000	38000000

LJ MIX Parameters	Sample Date Units	2018-01-08	2018-02-05	2018-03-06	2018-04-02	2018-05-08	2018-06-12	2018-07-09	2018-08-08	2018-09-03	2018-10-03	2018-10-17	2018-11-06	2018-12-11
pH, field measured	pH units	6	7	6.9	7	6.8	-	-	-	6.8	-	-	6.7	7.1
Total Suspended Solids	mg/L	12	36	25	86	2	10	22	37	14	9	-	30	10
Ammonia Nitrogen	mg N/L	12.8	4.34	0.84	10.8	3.9	19.8	48.8	19	9.44	19.7	-	10.5	10.9
Ammonia Nitrogen as NH3	mg N/L	0.01	< 0.01	< 0.01	0.01	0.02	0.15	0.54	-	< 0.01	0.2	-	0.03	0.06
Nitrogen, Kjeldahl	mg N/L	17.4	10.6	5.33	17.3	6.02	24.8	56.4	21.5	11.5	23.2	-	16.2	12.9
Nitrate	mg N/L	16.8	15.8	19	21	21.8	11.5	4.85	-	19.5	13.4	-	12.7	11.1
Nitrite	mg N/L	0.26	0.65	0.16	0.22	0.23	0.35	0.95	-	0.22	0.42	-	0.68	0.57
Biochemical Oxygen Demand, 5 Day	mg/L	11	43	16	17	8	15	14	9	12	15	-	9	4
Chemical Oxygen Demand	mg/L	61	93	94	105	44	74	86	42	53	66	-	55	65
Fecal Coliforms	CFU/100mL	< 100	2400	3100	6100	1000	1600	490	800	40	-	900	1 400	3100
Total Coliform	CFU/100mL	6000	210000	60000	57000	35000	40000	4 000	15 000	< 100000	-	18 000	13 000	23000
Atypical colonies	CFU/100mL	66000	140000	20000	42000	< 1000	750000	17 000	7 000	1,400,000	-	18 000	3 000	8000

STP-OUT Parameters	Sample Date Units	2018-01-08	2018-02-05	2018-03-06	2018-04-02	2018-05-08	2018-06-12	2018-07-09	2018-08-08	2018-09-03	2018-10-03	2018-10-17	2018-11-06	2018-12-11
pH, field measured	pH units	6.9	6.8	7.1	7.2	7.4	-	6.8	6.5	7.3	-	-	7.4	7.4
Total Suspended Solids	mg/L	4	30	22	20	8	8	19	6	15	10	-	19	18
Ammonia Nitrogen	mg N/L	40.9	15.5	22.3	29.9	33.7	29.3	28.1	35.4	45.2	37.4	-	24	27.3
Ammonia Nitrogen as NH3	mg N/L	0.55	0.18	0.23	0.33	0.31	0.41	0.14	0.32	0.61	0.55	-	0.31	0.33
Nitrogen, Kjeldahl	mg N/L	50	23.7	25.5	36.4	37.8	41.6	34.3	41.6	45.9	42.7	-	33.8	31.9
Nitrate	mg N/L	7.52	9.43	6.74	9.5	7.22	4.17	10	5.81	4.5	6.78	-	7.24	6.61
Nitrite	mg N/L	1.24	0.56	1.51	1.1	1.09	0.92	0.71	1.04	1.15	1.08	-	1.29	1.14
Biochemical Oxygen Demand, 5 Day	mg/L	9	45	8	21	13	14	12	16	14	7	-	11	16
Chemical Oxygen Demand	mg/L	66	94	80	80	67	67	67	63	73	95	-	65	76
Fecal Coliforms	CFU/100mL	30	220	160	230	80	190	140	109	800	-	320	190	52
Total Coliform	CFU/100mL	< 1000	9000	< 10000	< 10000	2000	6000	6000	20000	< 10000	-	12 000	1 200	35000
Atypical colonies	CFU/100mL	70000	84000	840000	260000	62000	65000	32000	44000	180000	-	20 000	12 800	< 1000

Table 8.48: Meadowbank 2018 Sewage Treatment Plant Waste Volume

Sewage volume from STP 2018			
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	2518	3503	20.40
February	2389	3287	6.80
March	2665	3670	13.60
April	2436	3345	52.70
May	2726	3597	40.80
June	2582	3463	11.49
July	2587	3674	17.00
August	2587	3667	23.80
September	2613	3655	58.77
October	2513	3615	10.20
November	2601	3681	20.40
December	2696	3710	30.60

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 8.49: Whale Tail 2018 Sewage Treatment Plant Water Quality Monitoring (MEA-2)

Parameters	LIMIT	Units	1/2/2018	1/8/2018	1/15/2018	1/22/2018	1/29/2018	2/5/2018	2/12/2018	2/20/2018	2/26/2018	3/5/2018	3/12/2018
pH	6 - 9.5	pH units	7.56	7.77	7.82	7.73	7.66	7.64	7.73	7.4	7.35	7.39	7.41
pH, field measured	6 - 9.5	pH units	-	-	-	-	-	-	-	-	-	-	-
NH4		mg-N/L	47.2	-	88	97.3	76.5	87.9	81.8	56.3	33.6	16.6	0.88
BOD5, Carbonaceous		mg/L	18	8	7	19	25	24	11	7	8	8	2
Fecal Coliforms	1000	CFU/100mL	< 10	2	< 2	2	**3300**	< 10	< 2	< 2	< 2	< 2	< 2
Oil & Grease	5	mg/L	1	<1	1	1	<1	1	1	<1	1	4	<1
Total Suspended Solids	100	mg/L	1	18	14	28	32	30	7	5	9.5	10	12

Parameters	3/19/2018	4/4/2018	4/9/2018	4/16/2018	4/23/2018	4/30/2018	5/6/2018	5/14/2018	5/21/2018	5/28/2018	6/5/2018	6/11/2018	6/18/2018
pH	7.00	7.36	7.28	7.2	6.06	7.29	7.05	7.38	7.83	7.16	6.2	6.67	6.16
pH, field measured	-	-	-	-	-	-	-	-	-	-	-	-	-
NH4	0.1	0.15	0.23	0.26	0.01	0.08	0.04	0.03	<0.01	0.06	0.04	0.03	0.3
BOD5, Carbonaceous	11	3	< 1	4	< 1	1	< 1	-	< 1	< 1	2	< 1	< 1
Fecal Coliforms	< 2	< 2	< 10	< 2	< 2	< 2	40	-	< 2	< 2	< 2	< 2	< 2
Oil & Grease	1	<1	<1	<1	<1	<1	<1	**29**	<1	<1	<1	<1	<1
Total Suspended Solids	9	21	2	2	< 1	1	< 1	6	< 1	< 1	< 1	< 1	< 1

Parameters	6/25/2018	7/2/2018	7/9/2018	7/16/2018	7/23/2018	7/30/2018	8/6/2018	8/14/2018	8/20/2018	8/27/2018	8/29/2018	9/3/2018
pH	6.63	5.93	6.58	6.74	6.85	6.84	6.78	6.72	6.36	6.21	6.22	6.75
pH, field measured	-	7	-	-	-	-	-	-	-	-	-	-
NH4	0.1	1.98	0.16	0.26	0.16	0.16	0.27	0.12	0.2	0.17	0.19	78
BOD5, Carbonaceous	< 1	< 1	<1	< 1	< 1	< 1	< 1	< 1	< 2	< 2	< 2	5
Fecal Coliforms	< 2	< 2	<2	2	4	3	2	13	2	100	4	800
Oil & Grease	<1	4	<1	3	3	<1	<1	1	1	<1	<1	<1
Total Suspended Solids	2	3	2	< 1	3	1	< 1	< 1	1	1	< 1	3

Parameters	9/17/2018	9/24/2018	10/2/2018	10/9/2018	10/15/2018	10/22/2018	10/29/2018	11/5/2018	11/12/2018	11/19/2018	11/26/2018	12/3/2018	12/11/2018	12/17/2018
pH		-	-	-	7.4	7.36	7.5	7.52	7.56	7.33	7.32	7.61	7.36	7.35
pH, field measured	7.11	**5.89**	**5.45**	6.88	7.22	-	7.16	-	-	-	6.32	-	7.2	-
NH4	0.11	0.17	0.52	0.16	0.28	0.13	0.15	0.15	0.13	0.08	0.10	0.03	0.03	0.02
BOD5, Carbonaceous	< 2	< 2	3	< 2	10	< 2	< 2	<4	<2	<2	<2	< 2	4	1
Fecal Coliforms	-	11	62	78	78	55	15	38	52	36	78	5	1100	270
Oil & Grease	< 1	< 1	1	< 1	< 1	< 1	< 1	<2	<3	**6.1**	<3	< 3	< 3	< 3
Total Suspended Solids	< 1	2	1	< 1	1	11	1	4	2	2	3	1	8	1

Table 8.50: Whale Tail 2018 Sewage Treatment Plant Waste Volume

Sewage volume from STP 2018		
Month	**Total outflow from bionest (m^3)**	**Total outflow from Newterra (m^3)**
January	543.52	
February	432.7	
March	684.57	
April	287.69	473.84
May		793.67
June		938.82
July		880.44
August		1093.53
September		1213.07
October		1381.64
November		1231.32
December		1257.14
TOTAL	1948.48	9263.47

The grease and sludge are from the transport to the tailing in Meadowbank with the vacuum truck

Table 8.51: 2018 Meadowbank Bulk Fuel Storage Facility Water Quality Monitoring (ST-37)

	Sample Date	Annual Average				6/11/2018
Parameters	**Units**	**2015**	**2016**	**2017**		
Field Measured						
pH	pH units	8.15	8.11	7.8		7.49
Conductivity	us/ohm	-	0.071	0.23		416
Temperature	°C	-	12.2	23.6		5.1
Conventional Parameters						
Total suspended solids	mg/L	1	1	11		10
Nutrients and Chlorophyll a						
Ammonia Nitrogen	mg/L	0.01	0.09	0.09		0.06
Ammonia (NH3)	mg/L	-	0.01	0.01		< 0.01
General Organics						
Total oil and grease	mg/L	1	1	1		< 1
Total Metals						
Arsenic	mg/L	0.0079	0.002	0.0005		0.0016
Copper	mg/L	0.0074	0.0041	0.0005		0.0041
Lead	mg/L	0.0003	0.0003	0.0003		< 0.0003
Nickel	mg/L	0.005	0.0032	0.0049		0.0092
Zinc	mg/L	0.002	0.003	0.001		0.003
Volatile Organics						
Benzene	ug/L	0.3	0.3	0.2		< 0.2
Ethylbenzene	ug/L	0.3	0.3	0.28		0.13
Toluene	ug/L	0.3	0.3	0.1		< 0.1
Xylenes	ug/L	0.3	0.3	1.1		0.54

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.52: 2018 Secondary Containment Water Quality at the Baker Lake Diesel Bulk Fuel Storage Facility (ST-40.1 and ST-40.2)

ST-40.1			Sample Date	Annual Average						6/9/2018	9/9/2018
Parameters	**MAX GRAB**	**MAX MEAN**	**Units**	**2013**	**2014**	**2015**	**2016**	**2017**			
Field Measured											
pH			pH units	-	-	6.18	7.77	7.54		7.31	8
Conductivity			umhos/cm	-	-	120.8	186.38	74.05		143.7	228
Temperature			°C	-	-	18.9	10.09	17.95		4.5	9.6
Conventional Parameters											
Total suspended solids	30	15	mg/L	20.4	9.33	15	7.83	16.5		16	1
Nutrients and Chlorophyll a											
Ammonia Nitrogen			mg/L	0.05	0.01	0.08	0.04	0.075		0.05	0.02
Ammonia (NH3)			mg/L	-	-	-	0.01	0.03		< 0.01	< 0.01
General Organics											
Total oil and grease			mg/L	-	-	1	1.33	1		< 1	1
Total Metals											
Arsenic	1	0.5	mg/L	-	-	0.0005	0.0005	0.0005		< 0.0005	< 0.0005
Copper	0.6	0.3	mg/L	-	-	0.0059	0.0057	0.0049		0.0039	0.0035
Lead	0.1	0.1	mg/L	-	-	0.0003	0.0003	0.0048		< 0.0003	< 0.0003
Nickel	1	0.5	mg/L	-	-	0.0005	0.0036	0.00085		0.0008	< 0.0005
Zinc	1	0.5	mg/L	-	-	0.001	0.0033	0.001		0.003	< 0.001
Volatile Organics											
Benzene	0.37	0.37	mg/L	-	-	0.3	0.3	0.3		< 0.2	0.0004
Ethylbenzene	0.09	0.09	mg/L	-	-	0.0003	0.0003	0.0003		< 0.0001	< 0.0003
Toluene	0.002	0.002	mg/L	-	-	0.0003	0.0003	0.0003		< 0.0001	0.0051
Xylenes			mg/L	-	-	0.0003	0.0003	0.0003		< 0.0004	0.0003
m,p-Xylenes			mg/L	-	-	0.0003	0.0003	0.0003		-	< 0.0003
o-Xylene			mg/L	-	-	0.0003	0.0003	0.0003		-	< 0.0003

Footnote:
The detection limit value was used in the calculation of the annual average

ST-40.2			Sample Date	Annual Average						6/9/2018	9/9/2018
Parameters	**MAX GRAB**	**MAX MEAN**	**Units**	**2013**	**2014**	**2015**	**2016**	**2017**			
Field Measured											
pH			pH units	-	-	6.21	7.67	7.34		7.24	7.86
Conductivity			umhos/cm	-	-	137.3	154.18	60.8		195.5	421
Temperature			°C	-	-	18.1	11.09	14.8		5.2	7.9
Conventional Parameters											
Total suspended solids	30	15	mg/L	6	9	26	18.2	8		9	3
Nutrients and Chlorophyll a											
Ammonia Nitrogen			mg/L	0.05	-	0.11	0.028	0.09		< 0.01	< 0.01
Ammonia (NH3)			mg/L	-	-	-	0.01	0.05		< 0.01	< 0.01
General Organics											
Total oil and grease			mg/L		-	1	1	1		< 1	1
Total Metals											
Arsenic	1	0.5	mg/L	-	-	0.0005	0.0005	0.0005		< 0.0005	< 0.0005
Copper	0.6	0.3	mg/L	-	-	0.0041	0.0043	0.0026		0.0049	0.0041
Lead	0.1	0.1	mg/L	-	-	0.0003	0.0003	0.001		< 0.0003	< 0.0003
Nickel	1	0.5	mg/L	-	-	0.0013	0.0010	0.0007		0.0011	0.0012
Zinc	1	0.5	mg/L	-	-	0.004	0.005	0.001		0.003	0.032
Volatile Organics											
Benzene	0.37	0.37	mg/L	-	-	0.3	0.3	0.3		< 0.2	< 0.0003
Ethylbenzene	0.09	0.09	mg/L	-	-	0.0003	0.0003	0.0003		< 0.0001	< 0.0003
Toluene	0.002	0.002	mg/L	-	-	0.0003	0.0003	0.0003		< 0.0001	0.0009
Xylenes			mg/L	-	-	0.0003	0.0003	0.0003		< 0.0004	0.001
m,p-Xylenes			mg/L	-	-	0.0003	0.0003	0.0003		-	0.0007
o-Xylene			mg/L	-	-	0.0003	0.0003	0.0003		-	0.0003

Footnote:
The detection limit value was used in the calculation of the annual average

Table 8.53: Whale Tail 2018 Culvert 181 water quality monitoring

Parameters	2018-06-26	
	Downstream	Upstream
pH	6.55	6.75
Cond	32	27
TSS	6	6
Hardness	10	8
Turb.	5.11	4.26
Ag	<0.0001	<0.0001
Al	0.060	0.048
As	<0.0005	<0.0005
Sb	<0.0001	<0.0001
B	<0.01	<0.01
Ba	0.0046	0.0039
Be	<0.0005	<0.0005
Ca	2.33	1.95
Cl	4.5	4
Cd	<0.00002	<0.0002
Cr	<0.0006	<0.0006
Cu	0.0049	<0.0005
Fe	0.25	0.21
K	0.38	0.31
Li	<0.005	<0.005
Hg	<0.00001	<0.0001
Mg	1.02	0.9
Mn	0.0172	0.0048
Mo	<0.0005	<0.0005
Na	0.66	0.60
Ni	0.0012	0.001
Pb	<0.0003	<0.0003
Se	<0.001	<0.001
Sn	<0.001	<0.001
SO (Sulphate)	3.1	2.3
Sr	0.013	0.012
Ti	<0.01	<0.01
U	<0.001	<0.001
V	<0.0005	<0.0005
Zn	0.011	<0.001

Table 8.54: Meadowbank 2018 MDMER QAQC

Sample Date			2/6/2018					3/5/2018			8/22/2018				10/15/2018			
Parameters	Units	MDL	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Original	Field Blank	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD
Conventional Parameters																		
Total suspended solids	mg/L	1	< 1	< 1	1	4	**120.0**	1	< 1	6	< 1	< 1	< 1	0.0	< 1	< 1	5	**133.3**
Major Ions																		
Cyanide	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0	< 0.001	< 0.001	0.002	0.001	0.003	0.001	**100.0**	< 0.001	< 0.001	0.001	0.0
Total Metals																		
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	< 0.0005	< 0.0005	0.0014	0.001	**33.3**	< 0.0005	< 0.0005	0.0013	0.0008	0.0008	0.0008	0.0	< 0.0005	< 0.0005	< 0.0005	0.0
Lead	mg/L	0.0003	< 0.0003	0.0049	0.0079	0.0041	63.3	< 0.0003	< 0.0003	0.0008	< 0.0003	< 0.0003	< 0.0003	0.0	< 0.0003	< 0.0003	< 0.0003	0.0
Nickel	mg/L	0.0005	< 0.0005	0.0009	0.0014	0.0015	6.9	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.001	0.0015	**40.0**	< 0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0	< 0.001	< 0.001	0.002	< 0.001	< 0.001	0.001	0.0	< 0.001	< 0.001	< 0.001	0.0
Radionuclides																		
Radium-226	Bq/l	0.002	-	< 0.002	< 0.002	< 0.002	0.0	-	-	-	< 0.002	< 0.002	0.005	**85.7**	< 0.002	< 0.002	0.005	**85.7**

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 8.55: Meadowbank 2018 EEM QAQC

Effluent characterization East Dike Final Discharge Point (ST-MMER-3-EEM)						
Date	Units	MDL	6-Feb-18			
Parameter / QAQC			Original	Duplicate	RPD	Field Blank
Alkalinity	mg CaCO3/L	2	28	28	0	3
Aluminium	mg/L	0.005	0.0042	0.0045	7	< 0.005
Ammonia nitrogen	mg N/L	0.01	0.01	0.03	**100**	0.03
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0	< 0.00002
Hardness	mg CaCO3/L	1	22	23	4	< 1
Iron	mg/L	0.01	0.08	0.08	0	0.03
Mercury	mg/L	0.00001	< 0.00001	0.00001	0	< 0.00001
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Nitrate	mg N/L	0.01	0.07	0.07	0	< 0.01
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	0	0.0010
% Exceedances*					0%	

Water Quality Monitoring Exposure Area Second Portage Lake						
Date	Units	MDL	5-Feb-18			
Parameter / QAQC			Original	Duplicate	RPD	Field Blank
Alkalinity	mg CaCO3/L	2	15	15	0	3
Aluminium	mg/L	0.005	< 0.005	0.006	18	< 0.005
Ammonia nitrogen	mg N/L	0.01	< 0.01	0.02	**67**	< 0.01
Arsenic	mg N/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0	< 0.00002
Copper	mg/L	0.0005	< 0.0005	< 0.0005	0	0.0044
Cyanide	mg/L	0.001	< 0.001	< 0.001	0	< 0.001
Hardness	mg CaCO3/L	1	16	15	6	< 1
Iron	mg/L	0.01	< 0.01	< 0.01	0	< 0.01
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0	< 0.0003
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0	< 0.00001
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Nickel	mg N/L	0.0005	0.0025	< 0.0005	**133**	< 0.0005
Nitrate	mg N/L	0.01	0.01	< 0.01	0	< 0.01
Radium 226	mg/L	NA	NMR	NMR		NMR
Total suspended solids	mg/L	1	2	8	**120**	1
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Zinc	mg/L	0.001	< 0.001	< 0.001	0	< 0.001
% Exceedances*					0%	

Water Quality Monitoring Reference Area Third Portage Lake South (ST-MMER-3-EEM-TPS)						
Date	Units	MDL	5-Feb-18			
Parameter / QAQC			Original	Duplicate	RPD	Field Blank
Alkalinity	mg CaCO3/L	2	10	10	0	3
Aluminium	mg/L	0.005	< 0.005	< 0.005	0	< 0.005
Ammonia nitrogen	mg N/L	0.01	0.03	0.03	0	0.03
Arsenic	mg N/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0	< 0.00002
Copper	mg/L	0.0005	< 0.0005	< 0.0005	0	0.8149
Cyanide	mg/L	0.001	< 0.001	< 0.001	0	< 0.001
Hardness	mg CaCO3/L	1	12	11	9	< 1
Iron	mg/L	0.01	< 0.01	< 0.01	0	< 0.01
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0	< 0.0003
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0	< 0.00001
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Nickel	mg N/L	0.0005	< 0.0005	< 0.0005	0	0.0056
Nitrate	mg N/L	0.01	0.03	0.03	0	< 0.01
Radium 226	mg/L	NA	NMR	NMR		NMR
Total suspended solids	mg/L	1	1	1	0	< 1
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Zinc	mg/L	0.001	< 0.001	< 0.001	0	0.194
% Exceedances*					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 8.56: Meadowbank 2018 STP QAQC

STP-IN	Sample Date		10/3/2018				11/6/2018		
Parameters	Units	MDL	Field Blank	Duplicate	Original	RPD	Duplicate	Original	RPD
Total Suspended Solids	mg/L	1	< 1	80	85	6.1	173	103	50.7
Ammonia Nitrogen	mg N/L	0.01	0.01	86.7	86	0.8	84	83	1.2
Ammonia (NH3)	mg N/L	0.01	< 0.01	1.58	1.53	3.2	1.19	1.18	0.8
Kjeldahl Nitrogen	mg N/L	0.05	< 0.05	99.2	99.5	0.3	105	108	2.8
Nitrate	mg N/L	0.01	< 0.01	0.07	0.03	**80.0**	0.06	0.03	**66.7**
Nitrite	mg N/L	0.01	< 0.01	0.01	0.03	**100.0**	0.01	0.03	**100.0**
Phosphorus	mg/L	0.01	0.18	9.27	6.38	36.9	11.8	12.8	8.1
Biochemical Oxygen Demand	mg/L	2	< 2	220	224	1.8	220	210	4.7
Chemical Oxygen Demand	mg/L	7	< 7	523	532	1.7	300	470	44.2

LJ MIX	Sample Date		2/5/2018			11/6/2018		
Parameters	Units	MDL	Duplicate	Original	RPD	Duplicate	Original	RPD
Total Suspended Solids	mg/L	1	36	36	0.0	33	30	9.5
Ammonia Nitrogen	mg N/L	0.01	4.45	4.34	2.5	10.9	10.5	3.7
Ammonia (NH3)	mg N/L	0.01	0.01	< 0.01	0.0	0.03	0.03	0.0
Kjeldahl Nitrogen	mg N/L	0.05	11.5	10.6	8.1	16.6	16.2	2.4
Nitrate	mg N/L	0.01	18	15.8	13.0	12.5	12.7	1.6
Nitrite	mg N/L	0.01	0.53	0.65	20.3	0.68	0.68	0.0
Biochemical Oxygen Demand	mg/L	2	24	43	56.7	6	9	**40.0**
Chemical Oxygen Demand	mg/L	7	91	93	2.2	47	55	15.7

STP-OUT	Sample Date		2/5/2018			11/6/2018		
Parameters	Units	MDL	Duplicate	Original	RPD	Duplicate	Original	RPD
Total Suspended Solids	mg/L	1	28	30	6.9	17	19	11.1
Ammonia Nitrogen	mg N/L	0.01	16.5	15.5	6.3	24.5	24	2.1
Ammonia (NH3)	mg N/L	0.01	0.17	0.18	5.7	0.27	0.31	13.8
Kjeldahl Nitrogen	mg N/L	0.05	25.9	23.7	8.9	32.8	33.8	3.0
Nitrate	mg N/L	0.01	10.6	9.43	11.7	7.53	7.24	3.9
Nitrite	mg N/L	0.01	0.01	0.56	*193.0*	1.3	1.29	0.8
Biochemical Oxygen Demand	mg/L	2	25	45	57.1	11	11	0.0
Chemical Oxygen Demand	mg/L	7	87	94	7.7	59	65	9.7

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 8.57: Meadowbank 2018 Non-contact diversion ditches (ST-5) QAQC

Sample Date			7/3/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
Total suspended solids	mg/L	1	< 1	< 1	0.0
Major Ions					
Cyanide	mg/L	0.001	0.002	0.009	**127.3**
Sulphate	mg/L	0.6	34.2	34.2	0.0
Total Metals					
Aluminum	mg/L	0.005	0.047	0.047	0.0
Arsenic	mg/L	0.0005	0.0015	< 0.0005	**100.0**
Copper	mg/L	0.0005	0.0034	0.0031	9.2
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Nickel	mg/L	0.0005	0.0045	0.0054	18.2
Zinc	mg/L	0.001	0.01	< 0.001	**163.6**
Radionuclides					
Radium-226	mg/L	0.002	< 0.002	0.004	**66.7**

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 8.58: Meadowbank 2018 Non-contact diversion ditches (ST-6) QAQC

Sample Date			7/3/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
Total suspended solids	mg/L	1	< 1	< 1	0.0
Major Ions					
Cyanide	mg/L	0.001	< 0.001	< 0.001	0.0
Sulphate	mg/L	0.6	5.4	5.3	1.9
Total Metals					
Aluminum	mg/L	0.006	< 0.006	< 0.006	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	< 0.0005	0.0006	18.2
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Nickel	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	0.0
Radionuclides					
Radium-226	mg/L	0.002	< 0.002	0.003	**40.0**

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 8.59: Meadowbank 2018 East Dike Discharge (ST-8) QAQC

Sample Date			2/6/2018					3/5/2018			8/22/2018				10/15/2018			
Parameters	Units	MDL	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Original	Field Blank	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD
Conventional Parameters																		
Total suspended solids	mg/L	1	< 1	< 1	1	4	**120.0**	1	< 1	6	< 1	< 1	< 1	0.0	< 1	< 1	5	**133.3**
Major Ions																		
Cyanide	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0	< 0.001	< 0.001	0.002	0.001	0.003	0.001	**100.0**	< 0.001	< 0.001	0.001	0.0
Sulphate	mg/L	0.6	< 0.6	< 0.6	6.8	7.2	5.7	< 0.6	< 0.6	8.5	0.9	19.9	20.7	3.9	< 0.6	7.7	8.9	14.5
Total Metals																		
Aluminum	mg/L	0.005	0.007	0.012	0.107	0.053	67.5	0.012	0.013	0.058	< 0.005	0.015	0.019	**23.5**	< 0.005	< 0.005	< 0.005	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	< 0.0005	< 0.0005	0.0014	0.001	**33.3**	< 0.0005	< 0.0005	0.0013	0.0008	0.0008	0.0008	0.0	< 0.0005	< 0.0005	< 0.0005	0.0
Lead	mg/L	0.0003	< 0.0003	0.0049	0.0079	0.0041	63.3	< 0.0003	< 0.0003	0.0008	< 0.0003	< 0.0003	< 0.0003	0.0	< 0.0003	< 0.0003	< 0.0003	0.0
Nickel	mg/L	0.0005	< 0.0005	0.0009	0.0014	0.0015	6.9	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.001	0.0015	**40.0**	< 0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0	< 0.001	< 0.001	0.002	< 0.001	< 0.001	0.001	0.0	< 0.001	< 0.001	< 0.001	0.0
Radionuclides																		
Radium-226	Bq/l	0.002	-	< 0.002	< 0.002	< 0.002	0.0	-	-	-	< 0.002	< 0.002	0.005	**85.7**	< 0.002	< 0.002	0.005	**85.7**

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 8.60: Meadowbank 2018 Rock Storage Facility ST-16 QAQC

Sample Date			8/21/2018			
Parameters	Units	MDL	Field Blank	Duplicate	Original	RPD
Conventional Parameters						
Hardness	mg CaCO3/L	1	< 1	191	205	7.1
Total suspended solids	mg/L	1	< 1	1	1	0.0
Total dissolved solids	mg/L	1	1	284	287	1.1
Major Ions						
Chloride	mg/L	0.5	< 0.5	5.7	5.1	11.1
Total Cyanide	mg/L	0.001	< 0.001	0.002	0.002	0.0
Cyanide WAD	mg/L	0.001	< 0.001	0.001	0.001	0.0
Free Cyanide	mg/L	0.005	<0.005	<0.005	<0.005	0.0
Fluoride	mg/L	0.01	0.02	0.21	0.2	4.9
Nutrients and Chlorophyll a						
Nitrate	mg/L	0.01	< 0.01	5.73	5.88	2.6
Nitrite	mg/L	0.01	0.01	0.03	0.03	0.0
Ammonia Nitrogen (NH3-NH4)	mg/L	0.01	0.22	0.07	0.07	0.0
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Total Metals						
Aluminum	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Antimony	mg/L	0.00001	< 0.00001	0.0003	0.0004	28.6
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0017	**109.1**
Barium	mg/L	0.0005	< 0.0005	0.0226	0.0248	9.3
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	0.01	0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	0.00004	0.00005	**22.2**
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	< 0.0006	0.0
Copper	mg/L	0.0005	< 0.0005	0.0135	0.0138	2.2
Iron	mg/L	0.01	< 0.01	0.26	0.4	42.4
Lead	mg/L	0.003	< 0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Manganese	mg/L	0.0005	< 0.0005	0.0708	0.0746	5.2
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	0.0118	0.0122	3.3
Nickel	mg/L	0.0005	< 0.0005	0.0165	0.0172	4.2
Selenium	mg/L	0.0005	< 0.0005	0.0008	0.0007	13.3
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Strontium	mg/L	0.005	< 0.005	0.203	0.269	28.0
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	< 0.01	0.05	0.05	0.0
Uranium	mg/L	0.001	< 0.001	0.004	0.004	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Dissolved Metals						
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0
Barium	mg/L	0.0005	< 0.0005	0.0213	0.0249	15.6
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.00006	**100.0**
Copper	mg/L	0.0005	< 0.0005	0.0098	0.0119	19.4
Iron	mg/L	0.01	< 0.01	0.08	0.1	*22.2*
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	0.0
Manganese	mg/L	0.0005	< 0.0005	0.0664	0.0747	11.8
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	0.0103	0.0123	17.7
Nickel	mg/L	0.0005	< 0.0005	0.0154	0.0171	10.5
Selenium	mg/L	0.0005	< 0.0005	0.0006	0.0012	**66.7**
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002	0.0
Zinc	mg/L	0.001	< 0.001	0.001	< 0.001	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 8.61: Meadowbank 2018 Portage Pit ST-19 QAQC

Sample Date			7/2/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
Hardness	mg CaCO3/L	1	163	193	16.9
Total suspended solids	mg/L	1	2	4	**66.7**
Total dissolved solids	mg/L	1	319	318	0.3
Major Ions					
Alkalinity	mg CaCO3/L	2	55	55	0.0
Chloride	mg/L	0.5	17.2	16.7	2.9
Total Cyanide	mg/L	0.001	0.026	0.011	81.1
Cyanide WAD	mg/L	0.001	0.017	0.011	42.9
Free Cyanide	mg/L	0.005	0.008	< 0.005	**46.2**
Fluoride	mg/L	0.01	0.29	0.29	0.0
Sulphate	mg/L	0.6	130	133	2.3
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.01	7.21	6.88	4.7
Nitrite	mg/L	0.01	0.12	0.12	0.0
Ammonia Nitrogen	mg/L	0.01	2.05	2.08	1.5
Ammonia (NH3)	mg/L	0.01	0.03	0.04	**28.6**
Total Metals					
Aluminum	mg/L	0.003	0.022	0.035	*45.6*
Arsenic	mg/L	0.0005	0.0016	0.0015	6.5
Barium	mg/L	0.0005	0.0107	0.0097	9.8
Cadmium	mg/L	0.00002	0.0002	0.00005	**120.0**
Chromium	mg/L	0.006	0.0006	0.0007	15.4
Copper	mg/L	0.0005	0.0007	0.0008	13.3
Iron	mg/L	0.01	0.09	0.07	**25.0**
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Manganese	mg/L	0.0005	0.1197	0.1209	1.0
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0222	0.0202	9.4
Nickel	mg/L	0.0005	0.0195	0.0182	6.9
Selenium	mg/L	0.001	< 0.001	< 0.001	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0.0
Zinc	mg/L	0.001	0.12	0.001	*196.7*
Dissolved Metals					
Aluminum	mg/L	0.06	< 0.06	0.016	**115.8**
Arsenic	mg/L	0.0005	0.002	0.0015	**28.6**
Barium	mg/L	0.005	0.0086	0.0107	**21.8**
Cadmium	mg/L	0.00002	0.00004	0.00006	**40.0**
Copper	mg/L	0.0005	0.0007	0.0007	0.0
Iron	mg/L	0.01	< 0.01	< 0.01	0.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Manganese	mg/L	0.0003	0.0872	0.1187	30.6
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0185	0.0202	8.8
Nickel	mg/L	0.0005	0.0195	0.0187	4.2
Selenium	mg/L	0.001	< 0.001	0.001	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	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 8.62: Meadowbank 2018 Goose Pit Lake (ST-20) QAQC

Sample Date			9/18/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
Hardness	mg CaCO3/L	1	140	129	8.2
Total suspended solids	mg/L	1	5	6	18.2
Total dissolved solids	mg/L	1	214	211	1.4
Total organic carbon	mg/L	0.2	33.2	3.2	164.8
Dissolved organic carbon	mg/L	0.2	3.2	3.4	6.1
Major Ions					
Alkalinity	mg CaCO3/L	2	65	68	4.5
Bicarbonate	mg CaCO3/L	2	58	63	8.3
Carbonate,	mg CaCO3/L	2	< 2	< 2	0.0
Chloride	mg/L	0.5	14.2	14.1	0.7
Total Cyanide	mg/L	0.001	0.001	0.001	0
Free Cyanide	mg/L	0.005	< 0.005	< 0.005	0.0
Sulphate	mg/L	0.6	82.2	81	1.5
Reactive silica	mg/L	-	6.57	6.35	3.4
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.01	2.37	2.33	1.7
Nitrite	mg/L	0.01	0.03	0.03	0.0
Ammonia Nitrogen	mg/L	0.01	0.2	0.2	0
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	0
Total Kjeldahl nitrogen	mg/L	0.01	0.97	0.86	12.0
Total phosphorus	mg-P/L	0.05	0.05	0.06	18.2
Orthophosphate	mg-P/L	0.01	0.02	0.06	**100.0**
Total Metals					
Aluminum	mg/L	0.005	0.168	0.128	27.0
Antimony	mg/L	0.0001	0.0002	0.0002	0.0
Arsenic	mg/L	0.0005	0.00081	0.0054	*147.8*
Barium	mg/L	0.0005	0.0423	0.0361	15.8
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	0.08	0.06	**28.6**
Cadmium	mg/L	0.00002	0.00003	0.00006	**66.7**
Calcium	mg/L	0.03	35.1	32.1	8.9
Chromium	mg/L	0.0006	0.0015	0.0011	**30.8**
Copper	mg/L	0.0005	0.0023	0.0015	**42.1**
Iron	mg/L	0.01	0.24	0.18	28.6
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	0.0
Magnesium	mg/L	0.02	12.9	11.9	8.1
Manganese	mg/L	0.0005	0.0117	0.0155	27.9
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0143	0.0171	17.8
Nickel	mg/L	0.0005	0.0167	0.0133	22.7
Potassium	mg/L	0.05	6.52	7.37	12.2
Silver	mg/L	-	-	-	-
Selenium	mg/L	0.0005	< 0.0005	0.0014	**94.7**
Sodium	mg/L	0.05	24.1	27.4	12.8
Strontium	mg/L	0.005	0.25	0.213	16.0
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	< 0.01	< 0.01	0.0
Uranium	mg/L	0.0005	0.008	0.008	0.0
Vanadium	mg/L	0.00005	< 0.00005	< 0.00005	0.0
Zinc	mg/L	0.001	0.003	0.003	0.0
Dissolved Metals					
Aluminum	mg/L	0.005	0.078	0.054	36.4
Antimony	mg/L	0.0001	0.0005	< 0.0001	**133.3**
Arsenic	mg/L	0.0005	0.0063	0.0053	17.2
Barium	mg/L	0.0005	0.0349	0.0312	11.2
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	0.08	0.07	13.3
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0.0
Copper	mg/L	0.0005	0.0014	0.001	**33.3**
Iron	mg/L	0.01	< 0.01	< 0.01	0.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	0.0
Manganese	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0

Molybdenum	mg/L	0.0005	0.0141	0.0123	13.6
Nickel	mg/L	0.0005	0.0123	0.0107	13.9
Selenium	mg/L	0.0005	< 0.0005	0.0008	**46.2**
Strontium	mg/L	0.005	0.215	0.189	12.9
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	< 0.01	< 0.01	0.0
Uranium	mg/L	0.0005	0.007	0.008	13.3
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	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 8.63: Meadowbank 2018 Goose Pit sump (ST-20) QAQC

Sample Date			7/4/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
Hardness	mg CaCO3/L	1	97	105	7.9
Total suspended solids	mg/L	1	5	10	**66.7**
Total dissolved solids	mg/L	1	166	163	1.8
Major Ions					
Alkalinity	mg/L	2	43	41	4.8
Chloride	mg/L	0.5	5.1	5.3	3.8
Total Cyanide	mg/L	0.001	0.006	0.008	**28.6**
Cyanide WAD	mg/L	0.001	0.005	0.008	**46.2**
Free Cyanide	mg/L	0.005	<0.005	< 0.005	0.0
Fluoride	mg/L	0.01	0.14	0.14	0.0
Sulphate	mg/L	0.6	60.4	62.5	3.4
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.01	2.39	2.47	3.3
Nitrite	mg/L	0.01	0.02	< 0.01	**66.7**
Ammonia Nitrogen	mg/L	0.01	0.26	0.25	3.9
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	0.0
Total Metals					
Aluminum	mg/L	0.005	0.481	0.504	4.7
Arsenic	mg/L	0.0005	0.0023	0.0030	**26.4**
Barium	mg/L	0.0005	0.0015	0.0139	*161.0*
Cadmium	mg/L	0.00002	<0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	0.0042	0.0042	0.0
Copper	mg/L	0.0005	0.0015	0.0016	6.5
Iron	mg/L	0.01	0.72	0.79	9.3
Lead	mg/L	0.0003	<0.0003	< 0.0003	0.0
Manganese	mg/L	0.0005	0.1087	0.1192	9.2
Mercury	mg/L	0.00001	<0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0038	0.0045	16.9
Nickel	mg/L	0.0005	0.031	0.0324	4.4
Silver	mg/L	0.0001	<0.0001	0.001	0.0
Selenium	mg/L	0.001	<0.001	< 0.0001	0.0
Thallium	mg/L	0.0008	<0.0008	< 0.0008	0.0
Zinc	mg/L	0.001	0.001	0.003	**100.0**
Dissolved Metals					
Aluminum	mg/L	0.006	<0.006	< 0.006	0.0
Arsenic	mg/L	0.0005	0.0024	0.0014	**52.6**
Barium	mg/L	0.0005	0.0105	0.0116	10.0
Cadmium	mg/L	0.00002	<0.00002	< 0.00002	0.0
Copper	mg/L	0.0005	<0.0005	< 0.0005	0.0
Iron	mg/L	0.01	<0.01	< 0.01	0.0
Lead	mg/L	0.0003	<0.0003	< 0.0003	0.0
Manganese	mg/L	0.0005	0.1035	0.1043	0.8
Mercury	mg/L	0.00001	<0.00001	0.00001	0.0
Molybdenum	mg/L	0.0005	0.0042	0.0054	*25.0*
Nickel	mg/L	0.0005	0.0272	0.0283	4.0
Selenium	mg/L	0.001	<0.001	0.003	0.0
Silver	mg/L	0.0001	0.0002	< 0.0001	**66.7**
Thallium	mg/L	0.0008	<0.0008	< 0.0008	0.0
Zinc	mg/L	0.001	0.001	0.001	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 8.64: Meadowbank 2018 South TSF (ST-21) QAQC

Sample Date			2/13/2018					3/6/2018			11/6/2018			12/4/2018			
Parameters	Units	MDL	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Original	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD
Conventional Parameters																	
pH	N/A	-	-	-	-	-		-	-	-	8.19	8.2	0.1	-	-	-	-
Hardness	mg CaCO3/L	1	< 1	< 1	1559	1516	2.8	< 1	< 1	1620	1017	994	2.3	1	1170	1291	9.8
Total dissolved solids	mg/L	1	1	3	3554	3464	2.6	< 1	1	3247	2426	2366	2.5	3	2527	2482	1.8
Total suspended solids	mg/L	1	< 1	7	5	2	**85.7**	< 1	3	8	6	6	0.0	<1	3	5	**50.0**
Dissolved organic carbon	mg/L	0.2	-	-	-	-	-	-	-	-	24.8	10.8	78.7	0.8	81.4	67.3	19.0
Major Ions																	
Alkalinity	mg CaCO3/L	2	3	3	113	112	0.9	2	2	117	145	143	1.4	4	149	152	2.0
Chloride	mg/L	0.5	< 0.5	< 0.5	531	499	6.2	< 0.5	< 0.5	560	405	418	3.2	<0.5	454	445	2.0
Total Cyanide	mg/L	0.001	< 0.001	< 0.001	1.74	1.76	1.1	< 0.001	< 0.001	2.57	0.926	0.899	3.0	0.003	0.597	0.558	6.8
Cyanide WAD	mg/L	0.001	< 0.001	< 0.001	0.74	0.069	165.9	< 0.001	< 0.001	0.019	0.528	0.523	1.0	<0.001	0.101	0.084	18.4
Free Cyanide	mg/L	0.005	-	< 0.005	0.01	0.42	*190.7*	-	-	-	-	-	-	<0.005	0.027	0.026	3.8
Fluoride	mg/L	0.02	< 0.02	< 0.02	0.43	0.42	2.4	< 0.02	< 0.02	0.48	0.49	0.49	0.0	<0.02	0.54	0.55	1.8
Sulphate	mg/L	0.6	< 0.6	< 0.6	2401	2365	1.5	< 0.6	< 0.6	2348	2242	2185	2.6	<0.6	2375	2344	1.3
Nutrients and Chlorophyll a																	
Nitrate	mg/L	0.01	< 0.01	< 0.01	5	4.82	3.7	< 0.01	< 0.01	4.51	4.23	4.28	1.2	<0.01	4.67	4.78	2.3
Nitrite	mg/L	0.01	< 0.01	< 0.01	0.23	0.22	4.4	< 0.01	< 0.01	0.2	0.16	0.16	0.0	<0.01	0.13	0.13	0.0
Ammonia Nitrogen	mg/L	0.01	0.01	0.02	61.2	57.8	5.7	< 0.01	< 0.01	62.5	48.8	48.6	0.4	<0.01	48.5	48.8	0.6
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	2.05	1.93	6.0	< 0.01	< 0.01	2.39	1.95	1.86	4.7	< 0.01	4.67	4.78	2.3
Total Metals																	
Aluminum	mg/L	0.0053	0.02	0.026	0.065	0.095	37.5	< 0.006	< 0.006	0.07	0.033	0.037	11.4	<0.005	0.013	0.021	**47.1**
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	0.0076	0.0176	0.016	9.5	<0.0005	0.0313	0.0363	14.8
Barium	mg/L	0.0005	< 0.0005	< 0.0005	0.165	0.1532	7.4	< 0.0005	< 0.0005	0.2004	0.0508	0.0529	4.1	<0.0005	0.0533	0.0574	7.4
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.00226	0.00213	5.9	< 0.00002	< 0.00002	0.00007	0.00116	0.00118	1.7	<0.00002	0.00185	0.00222	18.2
Calcium	mg/L	0.03	-	-	-	-	-	-	-	-	347	339	2.3	<0.03	402	445	10.2
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0.0038	0.0038	0.0	< 0.0006	< 0.0006	0.0008	0.0012	0.0009	**28.6**	<0.0006	0.0010	0.0016	**46.2**
Copper	mg/L	0.0005	< 0.0005	< 0.0005	0.4011	0.4288	6.7	< 0.0005	< 0.0005	3.409	1.016	0.9924	2.4	<0.0005	0.0825	0.0972	16.4
Iron	mg/L	0.01	< 0.01	< 0.01	1.07	1.03	3.8	< 0.01	0.01	0.799	0.44	0.39	12.0	<0.01	0.29	0.4	31.9
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0	< 0.0003	< 0.0003	< 0.0003	0.0039	0.0041	5.0	<0.0003	0.0012	0.0015	**22.2**
Magnesium	mg/L	0.02	-	-	-	-	-	-	-	-	36.7	36	1.9	<0.02	40.4	43.8	8.1
Manganese	mg/L	0.0005	< 0.0005	< 0.0005	0.4568	0.4385	4.1	< 0.0005	< 0.0005	0.3445	0.7723	0.7544	2.3	<0.0005	0.7773	0.8694	11.2
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.00066	0.00064	3.1	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00001	0.0	<0.00001	<0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	0.0016	0.7494	0.7054	6.0	< 0.0005	< 0.0005	0.6229	0.429	0.4105	4.4	0.0011	0.4339	0.4844	11.0
Nickel	mg/L	0.0005	< 0.0005	< 0.0005	0.071	0.068	4.3	< 0.0005	< 0.0005	0.3051	0.1272	0.1232	3.2	<0.0005	0.0483	0.0544	11.9
Potassium	mg/L	0.05	-	-	-	-	-	-	-	-	115	113	1.8	<0.05	121	130	7.2
Selenium	mg/L	0.001	< 0.001	< 0.001	0.087	0.085	2.3	< 0.001	< 0.001	0.073	0.0524	0.0511	2.5	0.0005	0.0456	0.0495	8.2
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0	< 0.0001	< 0.0001	0.0006	< 0.0001	< 0.0001	0.0	<0.0001	<0.0001	0.0001	0.0
Sodium	mg/L	0.05	-	-	-	-	-	-	-	-	664	651	2.0	0.14	710	758	6.5
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	0.0	< 0.0008	< 0.00008	< 0.0008	< 0.0002	< 0.0002	0.0	<0.0002	<0.0002	< 0.0002	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	0.004	0.005	**22.2**	< 0.001	< 0.001	0.002	< 0.001	< 0.001	0.0	<0.001	0.002	0.003	**40.0**
Dissolved Metals																	
Aluminum	mg/L	0.006	< 0.006	< 0.006	0.04	0.031	**25.4**	< 0.006	< 0.006	< 0.006	< 0.005	< 0.005	0.0	<0.005	<0.005	< 0.005	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	0.0083	0.0086	0.0112	*26.3*	<0.0005	0.0299	0.033	9.9
Barium	mg/L	0.0005	< 0.0005	< 0.0005	0.1566	0.1376	12.9	< 0.0005	< 0.0005	0.1895	0.0488	0.0497	1.8	<0.0005	0.0554	0.0599	7.8
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.00179	0.00143	22.4	< 0.00002	< 0.00002	0.00006	0.00127	0.00116	9.1	<0.00002	0.00207	0.00217	4.7
Chromium	mg/L	0.0006	-	-	-	-	-	-	-	-	< 0.0006	< 0.0006	0.0	<0.0006	0.0022	0.0037	**50.8**
Copper	mg/L	0.0005	0.0007	0.0011	0.026	0.0149	54.3	< 0.0005	< 0.0005	0.8201	0.8207	0.8297	1.1	<0.0005	0.0622	0.0662	6.2
Iron	mg/L	0.01	< 0.01	< 0.01	0.7	0.59	17.1	< 0.01	< 0.01	0.01	0.03	0.04	**28.6**	<0.01	0.06	0.06	0.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0003	0.0	<0.0003	<0.0003	< 0.0003	0.0
Manganese	mg/L	0.0005	< 0.0005	< 0.0005	0.4824	0.4013	18.4	< 0.0005	< 0.0005	0.315	0.6254	0.6364	1.7	<0.0005	0.7773	0.8173	5.0
Mercury	mg/L	0.00001	0.00001	0.00003	0.00069	0.00067	2.9	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.0	<0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	0.0015	0.7306	0.6232	15.9	< 0.0005	< 0.0005	0.6277	0.4205	0.4288	2.0	0.0013	0.4504	0.4938	9.2
Nickel	mg/L	0.0005	< 0.0005	< 0.0005	0.0425	0.0392	8.1	< 0.0005	< 0.0005	0.1381	0.1142	0.1139	0.3	<0.0005	0.0452	0.0484	6.8
Selenium	mg/L	0.001	< 0.001	< 0.001	0.092	0.078	16.5	< 0.001	< 0.001	0.077	0.0579	0.0565	2.4	0.0005	0.0463	0.0511	9.9
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0	<0.0001	<0.0001	< 0.0001	0.0
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	-	< 0.0008	-	-	< 0.0008	< 0.0008	< 0.0002	< 0.0002	0.0	<0.0002	<0.0002	< 0.0002	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	0.004	0.002	**66.7**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0	<0.001	0.001	0.002	**66.7**

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 8.65: Meadowbank 2018 Vault Pit sump (ST-23) QAQC

Sample Date			6/12/2018			11/4/2018	
Parameters	Units	MDL	Duplicate	Original	RPD	Field Blank	Original
Conventional Parameters							
Hardness	mg CaCO3/L	1	140	138	1.4	<1	525
Total dissolved solids	mg/L	1	282	283	0.4	1	488
Total suspended solids	mg/L	1	28	24	15.4	1	4
Total organic carbon	mg/L	0.2	8.1	7.4	9.0	-	8.2
Dissolved organic carbon	mg/L	0.2	7.4	7.4	0.0	4.7	8.2
Major Ions							
Alkalinity	mg CaCO3/L	2	100	100	0.0	3	156
Bicarbonate	mg CaCO3/L	2	100	100	0.0	3	156
Carbonate	mg CaCO3/L	2	< 2	< 2	0.0	<2	<2
Chloride	mg/L	0.5	19.1	19.4	1.6	<0.5	43.6
Cyanide	mg/L	0.001	0.102	0.105	2.9	0.004	0.028
Fluoride	mg/L	0.02	0.21	0.2	4.9	< 0.02	0.22
Sulphate	mg/L	0.6	79.1	74.4	6.1	< 0.6	356
Reactive silica	mg/L	0.01	7.43	7.15	3.8	< 0.01	8.59
Nutrients and Chlorophyll a							
Nitrate	mg/L	0.01	7.37	6.34	15.0	< 0.01	2.64
Nitrite	mg/L	0.01	0.21	0.23	9.1	< 0.01	0.06
Ammonia Nitrogen	mg/L	0.01	5.13	4.56	11.8	< 0.01	3.13
Total Kjeldahl nitrogen	mg/L	0.05	5.78	5.75	0.5	< 0.05	4.11
Ammonia (NH3)	mg/L	0.05	0.08	0.08	0.0	< 0.01	0.09
Total phosphorus	mg/L	0.01	0.03	0.03	0.0	< 0.01	< 0.01
Orthophosphate	mg/L	0.01	0.07	0.05	**33.3**	< 0.01	0.01
Total Metals							
Aluminum	mg/L	0.005	0.536	0.414	25.7	< 0.005	0.083
Antimony	mg/L	0.0001	0.536	0.414	25.7	< 0.0001	0.0078
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	0.0064
Barium	mg/L	0.0005	0.0193	0.0198	2.6	< 0.0005	0.0505
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005
Boron	mg/L	0.01	< 0.01	< 0.01	0.0	< 0.01	0.06
Cadmium	mg/L	0.00002	0.00007	0.00005	**33.3**	< 0.00002	< 0.00002
Calcium	mg/L	0.03	35.4	35.2	0.6	< 0.03	152
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0.0	< 0.0006	< 0.0006
Copper	mg/L	0.0005	0.0009	0.0023	**87.5**	< 0.0005	0.0007
Iron	mg/L	0.01	0.92	0.78	16.5	< 0.01	0.18
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0	< 0.0003	0.0041
Lithium	mg/L	0.005	< 0.005	< 0.005	0.0	< 0.005	0.008
Magnesium	mg/L	0.02	12.6	12.4	1.6	< 0.02	35.6
Manganese	mg/L	0.0005	0.0533	0.0479	10.7	< 0.0005	0.454
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0005	0.051	0.052	1.9	< 0.0005	0.0435
Nickel	mg/L	0.0005	0.0056	0.0053	5.5	0.0007	0.0083
Potassium	mg/L	0.05	11.4	11.9	4.3	< 0.05	5.91
Selenium	mg/L	0.001	< 0.001	< 0.001	0.0	< 0.0005	0.0009
Sodium	mg/L	0.05	10.8	11.4	5.4	< 0.05	19.8
Strontium	mg/L	0.005	0.465	0.463	0.4	< 0.005	1.19
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0.0	< 0.0002	< 0.0002
Tin	mg/L	0.001	0.008	0.008	0.0	< 0.001	< 0.001
Titanium	mg/L	0.01	0.05	0.04	**22.2**	< 0.01	< 0.01
Uranium	mg/L	0.0005	< 0.0005	< 0.0005	0.0	< 0.001	0.014
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005
Zinc	mg/L	0.001	< 0.001	< 0.001	0.0	< 0.001	0.002
Dissolved Metals							
Aluminum	mg/L	0.006	0.012	< 0.006	**66.7**	< 0.0005	<0.005
Antimony	mg/L	0.0001	0.0086	0.0085	1.2	< 0.0001	0.0052
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	0.0043
Barium	mg/L	0.0005	0.0151	0.0163	7.6	< 0.0005	0.0293
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005
Boron	mg/L	0.01	0.01	0.01	0.0	< 0.01	0.03
Cadmium	mg/L	0.00002	0.00035	0.00029	18.8	< 0.00002	0.00003
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0.0	< 0.0006	< 0.0006
Copper	mg/L	0.0005	0.0014	0.0015	6.9	< 0.0005	< 0.0005

Iron	mg/L	0.01	0.02	0.03	**40.0**	< 0.01	0.01
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0	< 0.0003	< 0.0003
Lithium	mg/L	0.005	< 0.005	< 0.005	0.0	< 0.005	0.007
Manganese	mg/L	0.0005	0.0451	0.0413	8.8	< 0.0005	0.3099
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0	0.00001	< 0.00001
Molybdenum	mg/L	0.0005	0.053	0.0516	2.7	< 0.0005	0.0301
Nickel	mg/L	0.0005	0.0047	0.0044	6.6	< 0.0005	0.0056
Selenium	mg/L	0.001	< 0.001	< 0.001	0.0	< 0.0005	< 0.0005
Strontium	mg/L	0.005	0.496	0.52	4.7	< 0.005	0.828
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0.0	< 0.0002	< 0.0002
Tin	mg/L	0.001	< 0.001	< 0.001	0.0	< 0.001	< 0.001
Titanium	mg/L	0.01	0.03	0.03	0.0	< 0.01	< 0.01
Uranium	mg/L	0.001	0.008	0.008	0.0	< 0.001	0.013
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005
Zinc	mg/L	0.001	0.001	< 0.001	0.0	0.001	0.001

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 8.66: Meadowbank 2018 Vault Rock Storage Facility (ST-24) QAQC

Sample Date			6/12/2018			7/9/2018	
Parameters	Units	MDL	Duplicate	Original	RPD	Field Blank	Original
Conventional Parameters							
Hardness	mg CaCO3/L	1	49	49	0.0	< 1	132
Total dissolved solids	mg/L	1	77	77	0.0	4	225
Total suspended solids	mg/L	1	67	69	2.9	1	9
Major Ions							
Alkalinity	mg/L	2	2	31	*175.8*	4	39
Chloride	mg/L	0.5	2.2	2	9.5	< 0.5	3.6
Total Cyanide	mg/L	0.001	<0.001	<0.001	0.0	< 0.001	0.001
Free Cyanide	mg/L	0.0005	-	-	-	< 0.0005	0.007
Fluoride	mg/L	0.02	0.06	0.06	0.0	< 0.02	0.08
Sulphate	mg/L	0.6	34.5	37	7.0	< 0.6	103
Nutrients and Chlorophyll a							
Nitrate	mg/L	0.01	1.11	1.14	2.7	< 0.01	2.51
Nitrite	mg/L	0.01	0.02	0.02	0.0	< 0.01	0.03
Ammonia Nitrogen	mg/L	0.01	0.01	0.09	**160.0**	< 0.01	0.51
Ammonia (NH3)	mg/L	0.01	0.01	<0.01	0.0	< 0.01	< 0.01
Total Metals							
Aluminum	mg/L	0.003	1.21	1.16	4.2	< 0.0006	0.191
Arsenic	mg/L	0.0005	<0.0005	<0.0005	0.0	< 0.0005	< 0.0005
Barium	mg/L	0.0005	0.017	0.0165	3.0	< 0.0005	0.0244
Cadmium	mg/L	0.00002	<0.00002	<0.00002	0.0	< 0.000002	0.00022
Chromium	mg/L	0.0006	0.0014	0.0009	**43.5**	< 0.0006	< 0.0006
Copper	mg/L	0.0005	0.0048	0.0045	6.5	0.0413	0.0038
Iron	mg/L	0.01	2.46	2.32	5.9	< 0.01	0.87
Lead	mg/L	0.0003	<0.0003	<0.0003	0.0	< 0.0003	< 0.0003
Manganese	mg/L	0.0005	0.1158	0.1132	2.3	< 0.0005	0.3317
Mercury	mg/L	0.00001	<0.00001	<0.00001	0.0	0.00002	0.00005
Molybdenum	mg/L	0.0005	0.0038	0.004	5.1	< 0.0005	0.0133
Nickel	mg/L	0.0005	0.0078	0.0074	5.3	0.0044	0.0088
Selenium	mg/L	0.001	<0.001	<0.001	0.0	< 0.001	0.003
Silver	mg/L	0.0001	<0.0001	<0.0001	0.0	< 0.0001	< 0.0001
Thallium	mg/L	0.0008	<0.0008	<0.0008	0.0	< 0.0008	< 0.0008
Zinc	mg/L	0.001	0.007	0.005	**33.3**	0.103	0.006

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 8.67: Meadowbank 2018 Vault Attenuation Pond (ST-25) QAQC

Sample Date			7/4/2018			
Parameters	Units	MDL	Field Blank	Duplicate	Original	RPD
Conventional Parameters						
Hardness	mg CaCO3/L	1	< 1	138	118	15.6
Total suspended solids	mg/L	1	1	3	5	**50.0**
Total dissolved solids	mg/L	1	2	206	211	2.4
Major Ions						
Alkalinity	mg CaCO3/L	2	4	31	31	0.0
Chloride	mg/L	0.5	< 0.5	7.6	7.6	0.0
Cyanide	mg/L	0.001	0.007	0.009	0.006	**40.0**
Fluoride	mg/L	0.02	< 0.02	0.16	0.16	0.0
Sulphate	mg/L	0.6	< 0.6	106	105	0.9
Nutrients and Chlorophyll a						
Nitrate	mg/L	0.01	< 0.01	1.95	1.96	0.5
Nitrite	mg/L	0.01	< 0.01	0.01	0.01	0.0
Ammonia Nitrogen	mg/L	0.01	0.01	0.84	0.87	3.5
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Total Metals						
Aluminum	mg/L	0.006	< 0.006	0.231	0.189	20.0
Arsenic	mg/L	0.0005	< 0.0005	0.0009	< 0.0005	**57.1**
Barium	mg/L	0.0005	< 0.0005	0.0226	0.0226	0.0
Cadmium	mg/L	0.00002	< 0.00002	0.00019	0.00017	11.1
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	< 0.0006	0.0
Copper	mg/L		0.002	0.0103	0.0094	9.1
Iron	mg/L	0.01	< 0.01	0.57	0.57	0.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	0.0
Manganese	mg/L	0.0005	< 0.0005	0.2575	0.2326	10.2
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	0.0038	0.0038	0.0
Nickel	mg/L	0.0005	< 0.0005	0.0191	0.0186	2.7
Selenium	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	< 0.0008	0.0
Zinc	mg/L	0.003	0.003	0.02	0.017	16.2

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 8.68: Meadowbank 2018 WEP 1 (ST-30) QAQC

Sample Date			7/3/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
Hardness	mg CaCO3/L	1	53	51	3.8
Total suspended solids	mg/L	1	< 1	< 1	0.0
Total dissolved solids	mg/L	1	93	94	1.1
Major Ions					
Alkalinity	mg CaCO3/L	2	40	40	0.0
Chloride	mg/L	0.5	2.8	2.9	3.5
Total Cyanide	mg/L	0.001	0.017	0.012	34.5
Free Cyanide	mg/L	0.005	< 0.005	< 0.005	0.0
Cyanide WAD	mg/L	0.001	0.006	0.007	15.4
Fluoride	mg/L	0.01	0.12	0.12	0.0
Sulphate	mg/L	0.6	25.4	25.7	1.2
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.01	0.18	0.17	5.7
Nitrite	mg/L	0.01	0.01	0.02	**66.7**
Ammonia Nitrogen	mg/L	0.01	0.18	0.18	0.0
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	0.0
Total Metals					
Aluminum	mg/L	0.003	0.035	0.051	37.2
Arsenic	mg/L	0.0005	0.0013	0.0011	16.7
Barium	mg/L	0.0005	0.0095	0.0091	4.3
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	0.0011	0.001	9.5
Copper	mg/L	0.0005	0.0127	0.0126	0.8
Iron	mg/L	0.01	0.77	0.93	18.8
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Manganese	mg/L	0.0005	0.0371	0.0407	9.3
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0018	0.0021	15.4
Nickel	mg/L	0.0005	0.0033	0.0037	11.4
Selenium	mg/L	0.001	0.003	0.001	**100.0**
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0.0
Zinc	mg/L	0.001	0.002	0.002	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 8.69: Meadowbank 2018 WEP 2 (ST-31) QAQC

Sample Date			7/3/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
Hardness	mg CaCO3/L	1	88	90	2.2
Total suspended solids	mg/L	1	13	23	55.6
Total dissolved solids	mg/L	1	128	122	4.8
Major Ions					
Alkalinity	mg CaCO3/L	2	63	59	6.6
Chloride	mg/L	0.5	7.6	8.6	12.3
Total Cyanide	mg/L	0.001	0.003	0.001	**100.0**
Free Cyanide	mg/L	0.001	0.003	0.001	**100.0**
Cyanide WAD	mg/L	0.005	< 0.005	< 0.005	0.0
Fluoride	mg/L	0.01	0.14	0.15	6.9
Sulphate	mg/L	0.6	23.8	28.2	16.9
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.01	0.18	0.19	5.4
Nitrite	mg/L	0.01	0.01	0.01	0.0
Ammonia Nitrogen	mg/L	0.01	0.09	0.09	0.0
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	0.0
Total Metals					
Aluminum	mg/L	0.0003	0.313	0.5	46.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	0.0136	0.0143	5.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	0.0008	0.0016	*66.7*
Copper	mg/L	0.0005	0.0034	0.0038	11.1
Iron	mg/L	0.01	1.22	1.69	32.3
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Manganese	mg/L	0.0005	0.1394	0.1605	14.1
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0008	0.0008	0.0
Nickel	mg/L	0.0005	0.0069	0.0077	11.0
Selenium	mg/L	0.001	< 0.001	< 0.001	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	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 8.70: Meadowbank 2018 seepage ST-32 QAQC

Sample Date			7/2/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
Hardness	mg CaCO3/L	1	172	170	1.2
Total suspended solids	mg/L	1	5	8	**46.2**
Total dissolved solids	mg/L	1	293	298	1.7
Major Ions					
Alkalinity	mg CaCO3/L	2	43	853	180.8
Chloride	mg/L	0.5	9.4	9.2	2.2
Cyanide	mg/L	0.001	0.019	0.01	62.1
Fluoride	mg/L	0.01	0.29	0.29	0.0
Sulphate	mg/L	0.6	111	112	0.9
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.01	10	9.09	9.5
Nitrite	mg/L	0.01	0.08	0.09	11.8
Ammonia Nitrogen	mg/L	0.01	4.55	4.52	0.7
Ammonia (NH3)	mg/L	0.01	0.08	0.09	11.8
Total Metals					
Aluminum	mg/L	0.003	0.22	0.154	35.3
Arsenic	mg/L	0.0005	0.0059	0.0092	43.7
Barium	mg/L	0.0005	0.0304	0.0422	32.5
Cadmium	mg/L	0.00002	< 0.00002	0.00007	**111.1**
Chromium	mg/L	0.0006	0.0015	0.002	**28.6**
Copper	mg/L	0.0005	0.0056	0.0066	16.4
Iron	mg/L	0.01	0.42	0.51	19.4
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Manganese	mg/L	0.0005	0.3287	0.3275	0.4
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0052	0.0069	28.1
Nickel	mg/L	0.0005	0.0205	0.023	11.5
Selenium	mg/L	0.001	< 0.001	< 0.001	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0.0
Zinc	mg/L	0.001	< 0.001	0.005	**133.3**

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 8.71: Meadowbank 2018 Bulk Fuel Storage Facility (ST-37) QAQC

Sample Date			6/11/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
Total suspended solids	mg/L	1	8	10	**22.2**
Nutrients and Chlorophyll a					
Ammonia Nitrogen	mg/L	0.01	0.06	0.06	0.0
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	0.0
General Organics					
Total oil and grease	mg/L	1	2	< 1	**66.7**
Total Metals					
Arsenic	mg/L	0.0005	0.0013	0.0016	**20.7**
Copper	mg/L	0.0005	0.0036	0.0041	13.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Nickel	mg/L	0.0005	0.0074	0.0092	21.7
Zinc	mg/L	0.001	< 0.001	0.003	**100.0**
Volatile Organics					
Benzene	ug/L	0.2	< 0.2	< 0.2	0.0
Ethylbenzene	ug/L	-	0.11	0.13	16.7
Toluene	ug/L	0.1	< 0.1	< 0.1	0.0
Xylenes	ug/L	-	0.49	0.54	9.7

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 8.72: Baker Lake 2018 Bulk Fuel Storage Facility (ST-40.1) QAQC

Sample Date			6/9/2018			9/9/2018			
Parameters	Units	MDL	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD
Conventional Parameters									
Total suspended solids	mg/L	1	11	16	37.0	< 1	1	1	0.0
Nutrients and Chlorophyll a									
Ammonia Nitrogen	mg/L	0.01	0.03	0.05	**50.0**	< 0.01	< 0.01	0.02	**66.7**
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	0.0	< 0.01	< 0.01	< 0.01	0.0
General Organics									
Total oil and grease	mg/L	1	< 1	< 1	0.0	< 1	2	1	**66.7**
Total Metals									
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0	< 0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	0.0038	0.0039	2.6	< 0.0005	0.0044	0.0035	**22.8**
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0	< 0.0003	< 0.0003	< 0.0003	0.0
Nickel	mg/L	0.0005	0.0008	0.0008	0.0	< 0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	0.007	0.003	**80.0**	< 0.001	< 0.001	< 0.001	0.0
Volatile Organics									
Benzene	mg/L	0.0002	< 0.0002	< 0.0002	0.0	< 0.0003	< 0.0003	0.0004	**28.6**
Ethylbenzene	mg/L	0.0001	< 0.0001	< 0.0001	0.0	< 0.0003	< 0.0003	< 0.0003	0.0
Toluene	mg/L	0.0001	< 0.0001	< 0.0001	0.0	< 0.0003	< 0.0003	0.0051	*177.8*
Xylenes	mg/L	0.0004	< 0.0004	< 0.0004	0.0	< 0.0003	< 0.0003	0.0003	0.0
m,p-Xylenes	mg/L	0.0003	-	-	-	< 0.0003	< 0.0003	< 0.0003	0.0
o-Xylene	mg/L	0.0003	-	-	-	< 0.0003	< 0.0003	< 0.0003	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 8.73: Baker Lake 2018 Bulk Fuel Storage Facility (ST-40.2) QAQC

Sample Date			6/9/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
Total suspended solids	mg/L	1	9	9	0.0
Nutrients and Chlorophyll a					
Ammonia Nitrogen	mg/L	0.01	0.08	0.01	**155.6**
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	0.0
General Organics					
Total oil and grease	mg/L	1	< 1	< 1	0.0
Total Metals					
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	0.0067	0.0049	*31.0*
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Nickel	mg/L	0.0005	0.0033	0.0011	**100.0**
Zinc	mg/L	0.001	0.003	0.003	0.0
Volatile Organics					
Benzene	mg/L	0.2	< 0.2	< 0.2	0.0
Ethylbenzene	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Toluene	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Xylenes	mg/L	0.0004	< 0.0004	< 0.0004	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 8.74: Meadowbank 2018 Phaser Pit sump (ST-41) QAQC

Sample Date			9/17/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
Hardness	mg CaCO3/L	1	200	197	1.5
Total suspended solids	mg/L	1	8	2	**120.0**
Total dissolved solids	mg/L	1	258	260	0.8
Major Ions					
Alkalinity	mg CaCO3/L	2	86	86	0.0
Chloride	mg/L	0.5	7.2	5.4	28.6
Total Cyanide	mg/L	0.001	0.018	0.019	5.4
Cyanide WAD	ppm	0.001	0.014	0.014	0.0
Free Cyanide	mg/L	0.005	0.016	0.014	13.3
Fluoride	mg/L	0.01	0.16	0.16	0.0
Sulphate	mg/L	0.6	78.6	77.2	1.8
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.01	8.81	9.04	2.6
Nitrite	mg/L	0.01	0.03	0.03	0.0
Ammonia Nitrogen	mg/L	0.01	3.04	2.98	2.0
Ammonia (NH3)	mg/L	0.01	0.04	0.03	**28.6**
Total Metals					
Aluminum	mg/L	0.005	0.283	0.208	30.5
Arsenic	mg/L	0.0005	0.0036	0.0037	2.7
Barium	mg/L	0.0005	0.0635	0.0582	8.7
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	0.001	0.0009	10.5
Copper	mg/L	0.0005	0.0051	0.0055	7.5
Iron	mg/L	0.01	0.4	0.39	2.5
Lead	mg/L	0.0003	0.0018	0.0012	**40.0**
Manganese	mg/L	0.0005	0.0389	0.0384	1.3
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0148	0.0145	2.0
Nickel	mg/L	0.0005	0.0029	0.0023	**23.1**
Selenium	mg/L	0.0005	< 0.0005	0.0009	**57.1**
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Zinc	mg/L	0.001	0.0003	0.002	*147.8*
Dissolved Metals					
Aluminum	mg/L	0.005	0.143	0.087	48.7
Arsenic	mg/L	0.0005	0.0027	0.0025	7.7
Barium	mg/L	0.0005	0.0635	0.0471	29.7
Cadmium	mg/L	0.00002	0.00004	0.00002	**66.7**
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0.0
Copper	mg/L	0.0005	0.0047	0.0053	12.0
Iron	mg/L	0.01	0.01	< 0.01	0.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Manganese	mg/L	0.0005	0.0304	0.0277	9.3
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0127	0.0112	12.6
Nickel	mg/L	0.0005	0.0015	0.0014	6.9
Selenium	mg/L	0.0005	0.0008	< 0.0005	**46.2**
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	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 8.75: Meadowbank 2018 BBPhaser Pit sump (ST-42) QAQC

Sample Date			9/17/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
Hardness	mg CaCO3/L	1	263	279	5.9
Total suspended solids	mg/L	1	11	5	*75.0*
Total dissolved solids	mg/L	1	374	371	0.8
Major Ions					
Alkalinity	mg CaCO3/L	2	2	83	*190.6*
Chloride	mg/L	0.5	7.1	7.2	1.4
Total Cyanide	mg/L	0.001	0.066	0.068	3.0
Free Cyanide	mg/L	0.005	0.044	0.036	20.0
Cyanide WAD	ppm	0.001	0.034	0.032	6.1
Fluoride	mg/L	0.01	0.17	0.16	6.1
Sulphate	mg/L	0.6	192	193	0.5
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.01	7.54	7.46	1.1
Nitrite	mg/L	0.01	0.14	0.14	0.0
Ammonia Nitrogen	mg/L	0.01	0.01	5.3	*199.2*
Ammonia (NH3)	mg/L	0.01	0.04	0.04	0.0
Total Metals					
Aluminum	mg/L	0.005	0.005	0.085	*177.8*
Arsenic	mg/L	0.0005	0.0005	0.0024	**131.0**
Barium	mg/L	0.0005	0.0005	0.0777	*197.4*
Cadmium	mg/L	0.00002	0.00002	0.00006	**100.0**
Chromium	mg/L	0.0006	0.0006	< 0.0006	0.0
Copper	mg/L	0.0005	0.0097	0.0108	10.7
Iron	mg/L	0.01	0.17	0.21	177.8
Lead	mg/L	0.0003	0.0033	< 0.0003	*166.7*
Manganese	mg/L	0.0003	0.2894	0.3217	10.6
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0081	0.0077	5.1
Nickel	mg/L	0.0005	0.0142	0.0147	3.5
Selenium	mg/L	0.0005	0.0019	< 0.0005	**116.7**
Silver	mg/L	0.0001	0.0001	< 0.0001	0.0
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Zinc	mg/L	0.001	0.008	0.01	**22.2**
Dissolved Metals					
Aluminum	mg/L	0.005	0.052	0.09	**53.5**
Arsenic	mg/L	0.0005	0.0021	0.0022	4.7
Barium	mg/L	0.0005	0.0737	0.0763	3.5
Cadmium	mg/L	0.00002	0.00009	< 0.00002	**127.3**
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0.0
Copper	mg/L	0.0005	0.0122	0.0091	**29.1**
Iron	mg/L	0.01	0.03	0.03	0.0
Lead	mg/L	0.0003	0.0006	0.0009	**40.0**
Manganese	mg/L	0.0003	0.2894	0.2887	0.2
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0072	0.0077	6.7
Nickel	mg/L	0.0005	0.0127	0.0134	5.4
Selenium	mg/L	0.0005	0.0008	0.0008	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Zinc	mg/L	0.001	0.008	0.005	**46.2**

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 8.76: Meadowbank 2018 Phaser Attenuation Pond (ST-43) QAQC

Sample Date			9/17/2018			
Parameters	Units	MDL	Field Blank	Duplicate	Original	RPD
Conventional Parameters						
Hardness	mg CaCO3/L	1	< 1	309	310	0.3
Total suspended solids	mg/L	1	1	8	8	0.0
Total dissolved solids	mg/L	1	1	425	429	0.9
Major Ions						
Alkalinity	mg CaCO3/L	2	2	11	10	9.5
Chloride	mg/L	0.5	< 0.5	< 0.5	6.3	*170.6*
Total Cyanide	mg/L	0.001	0.001	0.011	0.011	0.0
Free Cyanide	mg/L	0.005	< 0.005	0.008	0.009	11.8
Cyanide WAD	mg/L	0.001	< 0.001	0.008	0.009	11.8
Fluoride	mg/L	0.02	< 0.02	0.13	0.13	0.0
Sulphate	mg/L	0.6	< 0.6	357	384	7.3
Nutrients and Chlorophyll a						
Nitrate	mg/L	0.01	< 0.01	6.56	6.71	2.3
Nitrite	mg/L	0.01	< 0.01	0.08	0.08	0.0
Ammonia Nitrogen	mg/L	0.01	0.03	4.02	4.01	0.2
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Total Metals						
Aluminum	mg/L	0.0005	0.007	0.478	0.477	0.2
Arsenic	mg/L	0.0005	< 0.0005	0.002	0.0016	**22.2**
Barium	mg/L	0.0005	< 0.0005	0.0454	0.0486	6.8
Cadmium	mg/L	0.00002	0.00005	0.00153	0.00145	5.4
Chromium	mg/L	0.0006	< 0.0006	0.0018	< 0.0006	**100.0**
Copper	mg/L	0.0005	< 0.0005	0.0333	0.0338	1.5
Iron	mg/L	0.01	< 0.01	2.2	2.34	6.2
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0006	**66.7**
Manganese	mg/L	0.0005	< 0.0005	0.7402	0.7942	7.0
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	0.002	0.002	0.0
Nickel	mg/L	0.0005	< 0.0005	0.1027	0.1091	6.0
Selenium	mg/L	0.0005	< 0.0005	0.0062	0.0037	*50.5*
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002	0.0
Zinc	mg/L	0.001	< 0.001	0.132	0.136	3.0
Dissolved Metals						
Aluminum	mg/L	0.0005	0.054	0.112	0.477	123.9
Arsenic	mg/L	0.0005	< 0.0005	0.001	0.0009	10.5
Barium	mg/L	0.0005	< 0.0005	0.0534	0.0486	9.4
Cadmium	mg/L	0.00002	< 0.0002	0.00118	0.00129	8.9
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	< 0.0006	0.0
Copper	mg/L	0.0005	< 0.0005	0.0229	0.021	8.7
Iron	mg/L	0.01	< 0.01	0.52	0.48	8.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	0.0
Manganese	mg/L	0.0005	< 0.0005	0.9318	0.848	9.4
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	0.0015	0.0015	0.0
Nickel	mg/L	0.0005	< 0.0005	0.1259	0.1171	7.2
Selenium	mg/L	0.0005	< 0.0005	0.0038	0.0029	**26.9**
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002	0.0
Zinc	mg/L	0.001	< 0.001	0.138	0.135	2.2

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 2018 Seepage ST-S-1 QAQC

Sample Date			8/6/2018			
Parameters	Units	MDL	Field Blank	Duplicate	Original	RPD
Conventional Parameters						
Hardness	mg CaCO3/L	1	< 1	41	34	18.7
Total dissolved dolids	mg/L	1	1	69	67	2.9
Total suspended solids	mg/L	1	< 1	< 1	3	**100.0**
Major Ions						
Alkalinity	mg CaCO3/L	2	7	39	39	0.0
Chloride	mg/L	0.5	< 0.5	1.5	1.2	**22.2**
Cyanide	mg/L	0.001	< 0.001	0.001	0.002	**66.7**
Fluoride	mg/L	0.02	< 0.02	0.12	0.14	15.4
Sulphate	mg/L	0.6	< 0.6	22.8	20.2	12.1
Nutrients and Chlorophyll a						
Nitrate	mg/L	0.01	< 0.01	0.27	0.23	16.0
Nitrite	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Ammonia Nitrogen	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Total Metals						
Aluminum	mg/L	0.005	< 0.005	0.032	0.011	**97.7**
Arsenic	mg/L	0.0005	< 0.0005	0.0045	0.009	*66.7*
Barium	mg/L	0.0005	< 0.0005	0.0116	0.0103	11.9
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	< 0.0006	0.0
Copper	mg/L	0.0005	< 0.0005	0.0011	0.0009	20.0
Iron	mg/L	0.01	< 0.01	0.05	0.07	**33.3**
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	0.0
Manganese	mg/L	0.0005	< 0.0005	0.002	0.002	0.0
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.00021	*181.8*
Molybdenum	mg/L	0.0005	< 0.0005	0.0005	< 0.0005	0.0
Nickel	mg/L	0.0005	< 0.0005	0.0013	0.0015	14.3
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002	0.0
Zinc	mg/L	0.001	0.001	0.003	0.002	**40.0**

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 2018 Seepage ST-S-2 QAQC

Sample Date			6/11/2018			7/3/2018	
Parameters	Units	MDL	Duplicate	Original	RPD	Field Blank	Original
Conventional Parameters							
Hardness	mg CaCO3/L	1	49	48	2.1	< 1	276
Total dissolved solids	mg/L	1	68	69	1.5	1	364
Total suspended solids	mg/L	1	6	10	**50.0**	< 1	< 1
Major Ions							
Alkalinity	mg CaCO3/L	2	28	28	0.0	3	58
Chloride	mg/L	0.5	1.5	1.9	**23.5**	< 0.5	8
Total Cyanide	mg/L	0.001	0.012	0.012	0.0	0.001	0.021
Free Cyanide	mg/L	0.005	< 0.005	< 0.005	0.0	< 0.005	< 0.005
Cyanide WAD	mg/L	0.001	0.002	0.002	0.0	< 0.001	0.004
Fluoride	mg/L	0.02	0.05	0.05	0.0	< 0.02	0.23
Sulphate	mg/L	0.6	32	30	6.5	< 0.6	188
Nutrients and Chlorophyll a							
Nitrate	mg/L	0.01	0.66	0.68	3.0	< 0.01	4.39
Nitrite	mg/L	0.01	0.02	0.02	0.0	< 0.01	0.03
Ammonia Nitrogen	mg/L	0.01	0.16	0.14	13.3	< 0.01	0.22
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	0	< 0.01	< 0.01
Total Metals							
Aluminum	mg/L	0.006	0.371	0.365	1.6	< 0.006	0.29
Arsenic	mg/L	0.0005	0.0035	0.0021	**50.0**	< 0.0005	0.0022
Barium	mg/L	0.0005	0.0054	0.0057	5.4	< 0.0005	0.022
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.0	< 0.00002	0.00004
Chromium	mg/L	0.0006	0.0025	0.0024	4.1	< 0.0006	0.002
Copper	mg/L	0.0005	0.0052	0.0053	1.9	< 0.0005	0.0045
Iron	mg/L	0.01	1.01	0.84	18.4	< 0.01	0.54
Lead	mg/L	0.0003	0.0034	0.0014	*83.3*	< 0.0003	< 0.0003
Manganese	mg/L	0.0005	0.0943	0.0977	3.5	< 0.0005	0.3952
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0005	0.0016	0.0017	6.1	< 0.0005	0.0108
Nickel	mg/L	0.0005	0.0142	0.0147	3.5	< 0.0005	0.0294
Selenium	mg/L	0.001	0.001	< 0.001	0.0	< 0.001	0.001
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0	< 0.0001	< 0.0001
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0.0	< 0.0008	< 0.0008
Zinc	mg/L	0.001	< 0.001	< 0.001	0.0	< 0.001	< 0.001

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 8.79: Meadowbank 2018 Seepage ST-S-5 QAQC

Sample Date			2/6/2018				
Parameters	Units	MDL	Trip Blank	Field Blank	Duplicate	Original	RDP
Conventional Parameters							
Hardness	mg CaCO3/L	1	< 1	< 1	1245	926	29.4
Total dissolved solids	mg/L	1	< 1	2	2954	2900	1.8
Total suspended solids	mg/L	1	< 1	< 1	16	3	*136.8*
Major Ions							
Alkalinity	mg CaCO3/L	2	3	3	118	118	0.0
Chloride	mg/L	0.5	< 0.5	< 0.5	519	428	19.2
Total Cyanide	mg/L	0.001	0.001	< 0.001	0.127	0.127	0.0
Free Cyanide	mg/L	0.001	-	-	-	-	-
Cyanide WAD	mg/L	0.001	< 0.001	< 0.001	0.064	0.064	0.0
Fluoride	mg/L	0.02	< 0.02	< 0.02	0.59	0.61	3.3
Sulphate	mg/L	0.6	< 0.6	< 0.6	2044	2033	0.5
Nutrients and Chlorophyll a							
Nitrate	mg/L	0.01	< 0.01	< 0.01	0.01	0.01	0
Nitrite	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0
Ammonia Nitrogen	mg/L	0.01	0.02	< 0.01	33.3	31.3	6.2
Total Metals							
Aluminum	mg/L	0.006	< 0.006	< 0.006	0.01	0.009	0.001
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0562	0.0292	63.2
Barium	mg/L	0.0005	< 0.0005	< 0.0005	0.0255	0.0189	29.7
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.00079	0.00065	19.4
Calcium	mg/L	0.03	-	-	-	-	-
Chromium	mg/L	0.0006	0.0007	0.0011	0.0023	< 0.0006	**117.2**
Copper	mg/L	0.0005	< 0.0005	< 0.0005	0.0091	0.0066	31.8
Iron	mg/L	0.01	< 0.01	< 0.01	2.96	2	38.7
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0
Magnesium	mg/L	0.02	-	-	-	-	-
Manganese	mg/L	0.0005	< 0.0005	< 0.0005	2.554	1.913	28.7
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.00005	0.00004	**22.2**
Molybdenum	mg/L	0.0005	< 0.0005	0.0005	0.3563	0.2601	31.2
Nickel	mg/L	0.0005	< 0.0005	< 0.0005	0.0243	0.0184	27.6
Potassium	mg/L	0.05	-	-	-	-	-
Selenium	mg/L	0.001	< 0.001	< 0.001	0.019	0.012	45.2
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0
Sodium	mg/L	0.05	-	-	-	-	-
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	0
Zinc	mg/L	0.001	< 0.001	0.006	< 0.001	< 0.001	0
Dissolved Metals							
Aluminum	mg/L	0.006	< 0.006	< 0.006	< 0.006	< 0.006	0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0122	0.017	32.9
Barium	mg/L	0.0005	< 0.0005	< 0.0005	0.0277	0.0305	9.6
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.00079	0.0008	1.3
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	< 0.0006	0.0013	125
Copper	mg/L	0.0005	< 0.0005	< 0.0005	0.0087	0.0098	11.9
Iron	mg/L	0.01	< 0.01	< 0.01	0.08	0.14	*54.5*
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0
Manganese	mg/L	0.0005	< 0.0005	< 0.0005	2.264	2.514	10.5
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.00003	0.00003	0.0
Molybdenum	mg/L	0.0005	< 0.0005	0.0007	0.324	0.2601	21.9
Nickel	mg/L	0.0005	< 0.0005	< 0.0005	0.0219	0.0237	7.9
Selenium	mg/L	0.001	< 0.001	< 0.001	0.023	0.027	16.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0
Thallium	mg/L	0.0008	< 0.0008	-	< 0.0008	< 0.0008	0
Zinc	mg/L	0.001	< 0.001	-	0.014	< 0.001	*173.3*

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.

3/5/2018			10/1/2018		
Field Blank	**Trip Blank**	**Original**	**Duplicate**	**Original**	**RPD**
< 1	< 1	1489	1066	1109	4.0
< 1	1	2886	1693	1654	2.3
< 1	< 1	12	< 1	8	**176.5**
2	2	117	108	108	0.0
< 0.5	< 0.5	579	412	420	1.9
< 0.001	0.002	0.114	0.043	0.064	39.3
-	-	-	0.05	0.049	2.0
< 0.001	< 0.001	0.073	0.012	0.036	100.0
< 0.02	< 0.02	0.55	0.51	0.5	2.0
< 0.6	< 0.6	2066	2011	2005	0.3
< 0.01	< 0.01	< 0.01	< 0.01	0.01	0.0
< 0.01	< 0.01	0.01	0.03	0.02	**40.0**
< 0.01	< 0.01	0.41	0.36	0.35	2.8
0.01	< 0.01	29	28.2	29.1	3.1
< 0.006	< 0.006	0.01	< 0.005	< 0.005	0.0
< 0.0005	< 0.0005	0.0577	0.045	0.0441	2.0
< 0.0005	< 0.0005	0.0313	0.0244	0.0256	4.8
< 0.00002	< 0.00002	0.00003	0.00108	0.00107	0.9
-	-	-	326	343	5.1
< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.0
< 0.0005	< 0.0005	0.0005	0.0061	0.006	1.7
< 0.01	< 0.01	1.73	0.06	0.05	18.2
< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0
-	-	-	61.4	61.4	0.0
< 0.0005	< 0.0005	2.58	1.89	1.995	5.4
< 0.00001	< 0.00001	0.00003	< 0.00001	< 0.00001	0.0
< 0.0005	< 0.0005	0.378	0.254	0.2606	2.6
< 0.0005	< 0.0005	0.0137	0.0244	0.0264	7.9
-	-	-	72.9	75.7	3.8
< 0.001	< 0.001	0.002	0.0141	0.0143	1.4
< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
-	-	-	556	566	1.8
< 0.0008	< 0.0008	< 0.0008	< 0.0002	< 0.0002	0.0
< 0.003	< 0.001	< 0.001	< 0.001	< 0.001	0.0
< 0.006	< 0.006	0.01	< 0.005	< 0.005	0.0
< 0.0005	< 0.0005	0.0267	0.0109	0.0123	12.1
< 0.0005	< 0.0005	0.0295	0.0224	0.0256	13.3
< 0.00002	< 0.00002	0.00012	0.001	0.00113	12.2
< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.0009	**40.0**
< 0.0005	< 0.0005	< 0.0005	0.0058	0.006	3.4
< 0.01	< 0.01	0.017	0.06	0.05	18.2
< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0
< 0.0005	< 0.0005	2.687	1.89	2.277	18.6
0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
< 0.0005	< 0.0005	0.39	0.2455	0.2997	19.9
< 0.0005	< 0.0005	0.0131	0.024	0.029	18.9
< 0.001	< 0.001	0.008	0.0195	0.0227	15.2
< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
< 0.0008	< 0.0008	< 0.0008	< 0.0002	< 0.0002	0.0
< 0.003	< 0.001	< 0.001	< 0.001	< 0.001	0.0

Table 8.80: Meadowbank 2018 Dogleg QAQC

Sample Date			8/21/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
Hardness	mg CaCO3/L	1	108	89	19.3
Total suspended solids	mg/L	1	< 1	< 1	0.0
Total dissolved solids	mg/L	1	111	121	0.0
Total organic carbon	mg/L	0.2	4.5	4.6	2.2
Dissolved organic carbon	mg/L	0.2	3.9	4	2.5
Major Ions					
Alkalinity	mg CaCO3/L	2	55	56	1.8
Bicarbonate	mg CaCO3/L	2	55	56	1.8
Bromide	mg/L	0.01	0.05	0.05	0.0
Carbonate	mg CaCO3/L	2	< 2	< 2	0.0
Chloride	mg/L	0.5	8	8.1	1.2
Total Cyanide	mg/L	0.001	0.001	0.001	0.0
Free Cyanide	mg/L	0.005	< 0.005	< 0.005	0.0
Cyanide WAD	mg/L	0.001	< 0.001	< 0.001	0.0
Fluoride	mg/L	0.01	0.19	0.19	0.0
Magnesium	mg/L	0.02	7.91	7.58	4.3
Sulphate	mg/L	0.6	44	47.8	8.3
Silica	mg/L	0.02	0.44	0.39	12.0
Thiosulfates	mg/L	0.02	< 0.02	< 0.02	0.0
Thiocyanates	mg/L	0.05	<0.05	<0.05	0.0
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.01	0.12	0.12	0.0
Nitrite	mg/L	0.01	< 0.01	< 0.01	0.0
Ammonia Nitrogen	mg/L	0.01	0.02	0.03	**40.0**
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	0.0
Total Kjeldahl nitrogen	mg/L	0.05	0.9	0.24	0.0
Total phosphorus	mg/L	0.01	< 0.01	< 0.01	0.0
Orthophosphate	mg/L	0.01	< 0.01	< 0.01	0.0
Total Metals					
Aluminum	mg/L	0.005	< 0.005	< 0.005	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	0.0099	0.006	**49.1**
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.001	< 0.1	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.0
Calcium	mg/L	0.03	28.2	23.1	19.9
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0.0
Cobalt	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	0.0017	0.0013	**26.7**
Iron	mg/L	0.01	0.04	0.06	**40.0**
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	0.0
Magnesium	mg/L	0.02	9.29	7.75	18.1
Manganese	mg/L	0.0005	0.0024	0.0092	**117.2**
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0025	0.0021	17.4
Nickel	mg/L	0.0005	0.0029	0.0026	10.9
Potassium	mg/L	0.05	3.51	2.89	19.4
Selenium	mg/L	0.0005	0.0006	0.0005	18.2
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Sodium	mg/L	0.05	7.26	5.77	22.9
Strontium	mg/L	0.005	0.094	0.092	2.2
Tellurium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	0.02	0.02	0.0
Uranium	mg/L	0.0005	0.002	0.001	**66.7**
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0.0

Zinc	mg/L	0.001	0.001	< 0.001	0.0
Dissolved Metals					
Aluminum	mg/L	0.005	0.011	< 0.005	**75.0**
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	0.0054	0.0055	1.8
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0.0
Cobalt	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	0.0064	0.0021	*101.2*
Iron	mg/L	0.01	< 0.01	< 0.01	0.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	0.0
Manganese	mg/L	0.0005	0.0007	0.0009	**25.0**
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0019	0.0019	0.0
Nickel	mg/L	0.0005	0.0024	0.0026	8.0
Selenium	mg/L	0.001	< 0.001	< 0.001	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Strontium	mg/L	0.005	0.094	0.093	1.1
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	0.02	0.02	0.0
Uranium	mg/L	0.0005	0.001	0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	0.007	< 0.001	**150.0**

Footnotes:
NA: missing data
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 2018 NP1 West QAQC

Sample Date			8/21/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
Hardness	mg CaCO3/L	1	98	119	19.4
Total suspended solids	mg/L	1	1	1	0.0
Total dissolved solids	mg/L	1	132	132	0.0
Total organic carbon	mg/L	0.2	4.7	4.9	4.2
Dissolved organic carbon	mg/L	0.2	4.2	4	4.9
Major Ions					
Alkalinity	mg CaCO3/L	2	67	67	0.0
Bicarbonate	mg CaCO3/L	2	67	67	0.0
Bromide	mg/L	0.01	0.05	0.06	18.2
Carbonate	mg CaCO3/L	2	< 2	< 2	0.0
Chloride	mg/L	0.5	8	8	0.0
Total Cyanide	mg/L	0.001	< 0.001	< 0.001	0.0
Free Cyanide	mg/L	0.005	< 0.005	< 0.005	0.0
Cyanide WAD	mg/L	0.001	0.001	< 0.001	0.0
Fluoride	mg/L	0.01	0.19	0.19	0.0
Magnesium	mg/L	0.02	8.29	7.97	3.9
Sulphate	mg/L	0.6	44.2	44.5	0.7
Silica	mg/L	0.02	0.29	0.29	0.0
Thiosulfates	mg/L	0.02	< 0.02	< 0.02	0.0
Thiocyanates	mg/L	0.05	< 0.05	< 0.05	0.0
Nutrients and Chlorophyll a					
Ammonia Nitrogen	mg/L	0.01	0.02	0.02	0.0
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	0.0
Total Kjeldahl nitrogen	mg/L	0.05	0.18	0.29	**46.8**
Total phosphorus	mg/L	0.0006	0.0026	0.0023	12.2
Orthophosphate	mg/L	0.01	< 0.01	< 0.01	0.0
Total Metals					
Aluminum	mg/L	0.005	< 0.005	< 0.005	0.0
Antimony	mg/L	0.0001	0.0001	0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	0.0073	0.0086	16.4
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.0
Calcium	mg/L	0.03	25.2	30.6	19.4
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0.0
Cobalt	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	0.0012	0.0018	**40.0**
Iron	mg/L	0.01	0.07	0.03	**80.0**
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	0.0
Magnesium	mg/L	0.02	8.65	10.5	19.3
Manganese	mg/L	0.0003	0.0013	0.002	**42.4**
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0022	0.0026	16.7
Nickel	mg/L	0.0005	0.0027	0.0034	**23.0**
Potassium	mg/L	0.05	2.57	2.99	15.1
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Sodium	mg/L	0.05	6.84	8.31	19.4
Strontium	mg/L	0.005	0.09	0.091	1.1
Tellurium	mg/L	0.0005	< 0.0005	-	-
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	0.02	0.03	**40.0**
Uranium	mg/L	0.0005	0.001	0.002	**66.7**
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	0.0
Dissolved Metals					

Aluminum	mg/L	0.005	0.021	< 0.005	**123.1**
Antimony	mg/L	0.0001	< 0.0001	0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	0.0062	0.0066	6.3
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	0.0009	< 0.0006	**40.0**
Cobalt	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	0.001	0.0009	10.5
Iron	mg/L	0.01	< 0.01	< 0.01	0.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	0.0
Manganese	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0017	0.0017	0.0
Nickel	mg/L	0.0005	0.0026	0.0024	8.0
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Strontium	mg/L	0.005	0.095	0.096	1.0
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	0.02	0.02	0.0
Uranium	mg/L	0.0005	0.001	0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	0.0

Footnotes:

NA: missing data

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 2018 NP2 East QAQC

Sample Date			8/21/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
pH	pH units	-	7.91	7.92	0.1
Conductivity	uS/cm	1	170	171	0.6
Dissolved Oxygen	°C	0.1	10.22	10.21	0.1
Turbidity	NTU	0.02	0.66	0.91	31.8
Hardness	mg CaCO3/L	1	86	84	2.4
Total suspended solids	mg/L	1	2	1	66.7
Total dissolved solids	mg/L	1	113	114	0.9
Total organic carbon	mg/L	0.2	4.6	4.7	2.2
Dissolved organic carbon	mg/L	0.2	4.1	4.1	0.0
Major Ions					
Alkalinity	mg CaCO3/L	2	56	56	0.0
Bicarbonate	mg CaCO3/L	2	56	56	0.0
Bromide	mg/L	0.01	0.03	0.03	0.0
Carbonate	mg CaCO3/L	2	< 2	< 2	0.0
Chloride	mg/L	0.5	3.8	3.7	2.7
Total Cyanide	mg/L	0.001	< 0.001	< 0.001	0.0
Free Cyanide	mg/L	0.005	< 0.005	< 0.005	0.0
Cyanide WAD	mg/L	0.001	< 0.001	< 0.001	0.0
Fluoride	mg/L	0.01	0.14	0.14	0.0
Magnesium	mg/L	0.02	6.86	6.15	10.9
Sulphate	mg/L	0.6	43.0	39.2	9.2
Silica	mg/L	0.02	0.27	0.29	7.1
Thiosulfates	mg/L	0.02	<0.02	<0.02	0.0
Thiocyanates	mg/L	0.05	<0.05	<0.05	0.0
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.01	0.01	0.03	**100.0**
Nitrite	mg/L	0.01	0.02	0.01	**66.7**
Ammonia Nitrogen	mg/L	0.01	0.02	0.01	**66.7**
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	0.0
Total Kjeldahl nitrogen	mg/L	0.05	0.19	0.08	**81.5**
Total phosphorus	mg/L	0.0006	0.0032	0.0032	0.0
Orthophosphate	mg/L	0.01	< 0.01	< 0.01	0.0
Chlorophyll a	ug/L	0.04	1.1	1.6	37.0
Colour	CU	1	19	18	5.4
Total Metals					
Aluminum	mg/L	0.005	< 0.005	< 0.005	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	0.0061	0.0045	*30.2*
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.0
Calcium	mg/L	0.03	22.0	21.7	1.4
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0.0
Cobalt	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	0.0032	0.0029	9.8
Iron	mg/L	0.01	0.09	0.05	**57.1**
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	0.0
Magnesium	mg/L	0.02	7.68	7.3	5.1
Manganese	mg/L	0.0005	0.0046	0.0045	2.2
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0005	< 0.0005	0.0
Nickel	mg/L	0.0005	0.0069	0.0064	7.5
Potassium	mg/L	0.05	2.22	2.16	2.7
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Sodium	mg/L	0.05	8.10	7.75	4.4
Strontium	mg/L	0.005	0.063	0.065	3.1

Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	0.02	0.02	0.0
Uranium	mg/L	0.001	0.001	0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	0.0
Dissolved Metals					
Aluminum	mg/L	0.005	< 0.005	< 0.005	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	0.0042	0.0038	10.0
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	0.0008	< 0.0006	**28.6**
Cobalt	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	0.0023	0.0021	9.1
Iron	mg/L	0.01	< 0.01	< 0.01	0.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	0.0
Manganese	mg/L	0.0003	0.0007	0.0006	15.4
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Nickel	mg/L	0.0005	0.0056	0.0072	25.0
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Strontium	mg/L	0.005	0.066	0.067	1.5
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	0.02	0.01	**66.7**
Uranium	mg/L	0.001	< 0.001	< 0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	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 8.83: Meadowbank 2018 NP2 South QAQC

Sample Date			9/5/2018			
Parameters	Units	MDL	Field Blank	Duplicate	Original	RPD
Conventional Parameters						
Hardness	mg CaCO3/L	1	< 1	74	75	1.3
Total suspended solids	mg/L	1	< 1	< 1	< 1	0.0
Total dissolved solids	mg/L	1	2	109	109	0.0
Total organic carbon	mg/L	0.2	0.4	4.6	4.6	0.0
Dissolved organic carbon	mg/L	0.2	< 0.2	3.9	4	2.5
Major Ions						
Alkalinity	mg CaCO3/L	2	3	47	47	0.0
Bicarbonate	mg CaCO3/L	2	3	47	47	0.0
Bromide	mg/L	0.01	< 0.01	0.03	0.02	**40.0**
Carbonate	mg CaCO3/L	2	< 2	< 2	< 2	0.0
Chloride	mg/L	0.5	< 0.5	3.8	3.3	14.1
Total Cyanide	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Free Cyanide	mg/L	0.005	<0.005	<0.005	<0.005	0.0
Cyanide WAD	mg/L	0.001	0.001	< 0.001	< 0.001	0.0
Fluoride	mg/L	0.02	< 0.02	0.12	0.11	8.7
Magnesium	mg/L	0.02	< 0.02	6.64	6.82	2.7
Sulphate	mg/L	0.6	1.2	40.8	41.1	0.7
Silica	mg/L	0.02	0.12	0.53	0.51	3.8
Thiosulfates	mg/L	0.02	< 0.02	< 0.02	< 0.02	0.0
Thiocyanates	mg/L	0.05	< 0.05	< 0.05	< 0.05	0.0
Nutrients and Chlorophyll a						
Ammonia Nitrogen	mg/L	0.01	0.02	0.04	0.05	**22.2**
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Total Kjeldahl nitrogen	mg/L	0.05	0.05	0.34	0.033	**164.6**
Total phosphorus	mg/L	0.0006	0.0007	0.0054	0.0046	16.0
Orthophosphate	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Chlorophyll a	ug/L	1.4	0.27	1.1	0.77	**35.3**
Colour	CU	1	3	7	7	0.0
Total Metals						
Aluminum	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0007	**33.3**
Barium	mg/L	0.0005	< 0.0005	0.0039	0.004	2.5
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	< 0.00002	0.0
Calcium	mg/L	0.03	< 0.03	18.8	19	1.1
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	< 0.0006	0.0
Cobalt	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.01	0.2356	0.0036	0.0031	14.9
Iron	mg/L	0.01	< 0.01	0.05	0.05	0.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Magnesium	mg/L	0.02	< 0.02	6.75	6.72	0.4
Manganese	mg/L	0.0005	< 0.0005	0.0089	0.0091	2.2
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	0.0005	0.0005	0.0
Nickel	mg/L	0.0005	0.0075	0.0058	0.0056	3.5
Potassium	mg/L	0.05	< 0.05	2.09	2.09	0.0
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Sodium	mg/L	0.05	< 0.05	7.06	7.28	3.1
Strontium	mg/L	0.005	< 0.005	0.072	0.072	0.0
Tellurium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	< 0.01	0.02	0.02	0.0
Uranium	mg/L	0.001	< 0.001	0.001	< 0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0

Zinc	mg/L	0.001	0.001	< 0.001	< 0.001	0.0
Dissolved Metals						
Aluminum	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0007	**33.3**
Barium	mg/L	0.0005	< 0.0005	0.0041	0.004	2.5
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	18.8	< 0.00002	*200.0*
Chromium	mg/L	0.0006	< 0.0006	0.0009	0.001	10.5
Cobalt	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	0.2356	0.0027	0.003	10.5
Iron	mg/L	0.01	< 0.01	< 0.01	0.01	0.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Manganese	mg/L	0.0005	< 0.0005	0.0053	0.0091	52.8
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	0.0005	< 0.0005	0.0
Nickel	mg/L	0.0005	0.0009	0.0054	0.0056	3.6
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Strontium	mg/L	0.005	< 0.005	0.074	0.076	2.7
Thallium	mg/L	0.00002	0.0004	< 0.0002	0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	< 0.01	0.02	0.02	0.0
Uranium	mg/L	0.001	< 0.001	0.001	0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	0.008	< 0.001	< 0.001	0.0

Footnotes:
NA: missing data
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 2018 NP2 West QAQC

Sample Date			8/21/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
Hardness	mg CaCO3/L	2	83	97	15.6
Total suspended solids	mg/L	1	1	< 1	0.0
Total dissolved solids	mg/L	1	115	115	0.0
Total organic carbon	mg/L	0.2	4.3	4.4	2.3
Dissolved organic carbon	mg/L	0.2	4.2	4.2	0.0
Major Ions					
Alkalinity	mg CaCO3/L	2	60	58	3.4
Bicarbonate	mg CaCO3/L	2	60	58	3.4
Bromide	mg/L	0.01	0.03	0.03	0.0
Carbonate	mg CaCO3/L	2	< 2	< 2	0.0
Chloride	mg/L	0.5	3.6	3.5	2.8
Total Cyanide	mg/L	0.001	< 0.001	< 0.001	0.0
Cyanide WAD	mg/L	0.001	< 0.001	< 0.001	0.0
Fluoride	mg/L	0.01	0.14	0.14	0.0
Magnesium	mg/L	0.02	7.27	6.41	12.6
Sulphate	mg/L	0.6	39.3	40.4	2.8
Silica	mg/L	0.02	0.6	0.62	3.3
Thiosulfates	mg/L	0.02	< 0.02	< 0.02	0.0
Thiocyanates	mg/L	0.05	< 0.05	< 0.05	0.0
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.01	0.1	0.12	18.2
Nitrite	mg/L	0.01	0.01	0.01	0.0
Ammonia Nitrogen	mg/L	0.01	0.02	0.01	**66.7**
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	0.0
Total Kjeldahl nitrogen	mg/L	0.05	0.44	0.16	**93.3**
Total phosphorus	mg/L	0.0006	0.0031	0.0031	0.0
Orthophosphate	mg/L	0.01	< 0.01	< 0.01	0.0
Colour	mg/L	1	18	17	5.7
Total Metals					
Aluminum	mg/L	0.005	< 0.005	< 0.005	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	0.0064	0.0068	6.1
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.0
Calcium	mg/L	0.03	21.7	25.2	14.9
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0.0
Cobalt	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	0.0036	0.0039	8.0
Iron	mg/L	0.01	0.07	0.04	**54.5**
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	0.0
Magnesium	mg/L	0.02	7.18	8.44	16.1
Manganese	mg/L	0.0005	0.0054	0.0063	15.4
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	0.0006	0.0007	15.4
Nickel	mg/L	0.0005	0.0067	0.0088	27.1
Potassium	mg/L	0.05	2.07	2.39	14.3
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Sodium	mg/L	0.05	7.05	8.39	17.4
Strontium	mg/L	0.005	0.066	0.066	0.0
Tellurium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	0.02	0.02	0.0
Uranium	mg/L	0.0005	0.001	0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0.0

Zinc	mg/L	0.001	< 0.001	< 0.001	0.0
Dissolved Metals					
Aluminum	mg/L	0.005	0.033	< 0.005	**147.4**
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	0.0047	0.004	16.1
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	0.001	< 0.0006	**50.0**
Cobalt	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	0.0029	0.0025	14.8
Iron	mg/L	0.01	< 0.01	< 0.01	0.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	0.0
Manganese	mg/L	0.0005	0.0011	0.0007	**44.4**
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Nickel	mg/L	0.0005	0.0063	0.0057	10.0
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Strontium	mg/L	0.005	0.068	0.070	2.9
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	0.02	0.01	**66.7**
Uranium	mg/L	0.0005	0.001	0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	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 8.85: Meadowbank 2018 NP2 Winter QAQC

Sample Date			3/11/2018				
Parameters	Units	MDL	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters							
Hardness	mg CaCO3/L	1	< 1	< 1	148	144	2.7
Total dissolved solids	mg/L	1	< 1	< 1	259	255	1.6
Total suspended solids	mg/L	1	< 1	< 1	< 1	< 1	0.0
Total organic carbon	mg/L	0.2	0.3	0.5	8.9	8.7	2.3
Dissolved organic carbon	mg/L	0.2	0.2	0.4	8.5	8.3	2.4
Colour	TCU	1	< 1	< 1	3	3	0.0
Major Ions							
Alkalinity	mg CaCO3/L	2	2	2	99	100	1.0
Bicarbonate	mg CaCO3/L	2	2	2	99	100	1.0
Bromide	mg/L	0.01	< 0.01	< 0.01	0.12	0.11	8.7
Carbonate	mg CaCO3/L	2	< 2	< 2	< 2	< 2	0.0
Chloride	mg/L	0.5	< 0.5	< 0.5	10.1	9.8	3.0
Cyanide	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0
Fluoride	mg/L	0.02	< 0.02	< 0.02	0.25	0.27	7.7
Magnesium	mg/L	0.02	< 0.02	< 0.02	12.05	11.76	2.4
Sulphate	mg/L	0.6	< 0.6	0.7	88.4	87	1.6
Silica	mg/L	-	5.5	4.4	1.5	1.4	6.9
Thiosulfates	mg/L	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.0
Thiocyanates	mg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.0
Nutrients and Chlorophyll a							
Nitrate	mg/L	0.01	< 0.01	< 0.01	0.17	0.17	0.0
Nitrite	mg/L	0.01	< 0.01	< 0.01	0.01	0.01	0.0
Ammonia Nitrogen	mg/L	0.01	< 0.01	< 0.01	0.05	0.05	0.0
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0
Total Kjeldahl nitrogen	mg/L	0.05	< 0.05	< 0.05	0.32	0.27	16.9
Total phosphorus	mg/L	1.9	< 1.9	< 1.9	< 1.9	3.8	**66.7**
Orthophosphate	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.01	0.0
Chlorophyll a	mg/L	0.000013	< 0.00013	< 0.00013	0.00055	0.00087	45.1
Total Metals							
Aluminum	mg/L	0.006	< 0.006	< 0.006	< 0.006	< 0.006	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.001	0.0008	**22.2**
Barium	mg/L	0.0005	< 0.0005	< 0.0005	0.016	0.0174	8.4
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.0
Cobalt	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	< 0.0005	< 0.0005	0.0043	0.0041	4.8
Iron	mg/L	0.01	< 0.01	< 0.01	0.024	0.019	**23.3**
Lead	mg/L	0.0005	< 0.0005	< 0.0005	0.0025	0.0023	8.3
Lithium	mg/L	0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0
Magnesium	mg/L	0.02	< 0.02	< 0.02	12.3	12	2.5
Manganese	mg/L	0.0005	< 0.0005	< 0.0005	0.006	0.006	0.0
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0.0006	0.0008	**28.6**
Nickel	mg/L	0.0005	< 0.0005	< 0.0005	0.0094	0.009	4.3
Potassium	mg/L	0.05	< 0.05	< 0.05	4.17	4.04	3.2
Selenium	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Sodium	mg/L	0.05	< 0.05	< 0.05	16.2	15.1	7.0
Strontium	mg/L	0.005	< 0.005	< 0.005	0.155	0.154	0.6
Tellurium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0
Uranium	mg/L	0.001	< 0.001	< 0.001	0.002	0.002	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	0.001	< 0.001	0.002	< 0.001	**66.7**

Dissolved Metals							
Aluminum	mg/L	0.006	< 0.006	< 0.006	< 0.006	< 0.006	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0008	0.0008	0.0
Barium	mg/L	0.0005	< 0.0005	< 0.0005	0.015	0.0135	10.5
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	< 0.00002	0.00012	0.0
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.0
Cobalt	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	< 0.0005	< 0.0005	0.0043	0.0035	**20.5**
Iron	mg/L	0.01	< 0.010	< 0.010	< 0.010	< 0.010	0.0
Lead	mg/L	0.0005	< 0.0005	< 0.0005	0.0006	0.0011	**58.8**
Lithium	mg/L	0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0
Manganese	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0.0006	0.0006	0.0
Nickel	mg/L	0.0005	< 0.0005	< 0.0005	0.0086	0.009	4.5
Selenium	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Strontium	mg/L	0.005	< 0.005	< 0.005	0.154	0.158	2.6
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0
Uranium	mg/L	0.001	< 0.001	< 0.001	0.002	0.002	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	0.007	0.004	**54.5**

Footnotes:

NA: missing data

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 2018 Second Portage Lake QAQC

Sample Date			8/21/2018		
Parameters	Units	MDL	Duplicate	Original	RPD
Conventional Parameters					
pH	pH units	-	7.42	7.43	0.1
Hardness	mg CaCO3/L	1	20	18	10.5
Total suspended solids	mg/L	1	< 1	< 1	0.0
Total dissolved solids	mg/L	1	29	29	0.0
Dissolved Oxygen	mg/L	0.1	9.8	9.8	0.0
Turbidity	NTU	0.02	0.35	0.34	2.9
Total organic carbon	mg/L	0.2	1.8	1.8	0.0
Dissolved organic carbon	mg/L	0.2	1.6	1.6	0.0
Major Ions					
Alkalinity	mg CaCO3/L	2	14	14	0.0
Bicarbonate	mg CaCO3/L	2	14	14	0.0
Bromide	mg/L	0.01	< 0.01	< 0.01	0.0
Carbonate	mg CaCO3/L	2	< 2	< 2	0.0
Chloride	mg/L	0.5	1	1.1	9.5
Total Cyanide	mg/L	0.001	0.001	0.001	0.0
Free Cyanide	mg/L	0.005	< 0.005	< 0.005	0.0
Cyanide WAD	mg/L	0.001	< 0.001	0.001	0.0
Fluoride	mg/L	0.01	0.1	0.09	10.5
Magnesium	mg/L	0.02	1.41	1.42	0.7
Sulphate	mg/L	0.6	6.1	6.6	7.9
Silica	mg/L	0.02	0.31	0.3	3.3
Thiosulfates	mg/L	0.02	< 0.02	< 0.02	0.0
Thiocyanates	mg/L	0.05	< 0.05	< 0.05	0.0
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.01	0.1	0.01	**163.6**
Nitrite	mg/L	0.01	< 0.01	< 0.01	0.0
Ammonia Nitrogen	mg/L	0.01	0.02	0.01	**66.7**
Ammonia (NH3)	mg/L	0.01	< 0.01	< 0.01	0.0
Total Kjeldahl nitrogen	mg/L	0.05	0.9	< 0.05	*178.9*
Total phosphorus	mg/L	0.01	< 0.01	< 0.01	0.0
Orthophosphate	mg/L	0.01	< 0.01	< 0.01	0.0
Chlorophyll a	ug/L	0.04	0.89	1.1	21.1
Colour	CU	1	1	6	**142.9**
Total Metals					
Aluminum	mg/L	0.005	< 0.005	< 0.005	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	0.0023	0.0025	8.3
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.0
Calcium	mg/L	0.03	5.19	4.75	8.9
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0.0
Cobalt	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	0.0006	0.0006	0.0
Iron	mg/L	0.01	0.01	0.02	**66.7**
Lead	mg/L	0.00003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	0.0
Magnesium	mg/L	0.02	1.71	1.54	10.5
Manganese	mg/L	0.0005	0.0017	0.0014	19.4
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Nickel	mg/L	0.0005	0.0017	< 0.0005	**109.1**
Potassium	mg/L	0.05	0.74	0.67	9.9
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Sodium	mg/L	0.05	1.08	0.95	12.8
Strontium	mg/L	0.005	0.016	0.018	11.8
Tellurium	mg/L	0.0005	< 0.0005	< 0.0005	0.0

Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	< 0.01	< 0.01	0.0
Uranium	mg/L	0.001	< 0.001	< 0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	0.0
Dissolved Metals					
Aluminum	mg/L	0.005	< 0.005	< 0.005	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	0.0006	18.2
Barium	mg/L	0.0005	0.0007	0.0007	0.0
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0.0
Cobalt	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Copper	mg/L	0.0005	< 0.0005	0.0006	18.2
Iron	mg/L	0.01	0.01	0.02	**66.7**
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	0.0
Manganese	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Nickel	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Selenium	mg/L	0.0005	0.0006	< 0.0005	18.2
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0.0
Strontium	mg/L	0.005	0.018	0.018	0.0
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	< 0.01	< 0.01	0.0
Uranium	mg/L	0.001	< 0.001	< 0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	0.0

Footnotes:

NA: missing data

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 2018 TPL-Assay QAQC

Sample Date			2018-0917		
Parameters	Units	MDL	Duplicate	Original	RPD
Major Ions					
Alkalinity	mg CaCO3/L	2	25	25	0.0
Bromide	mg/L	0.01	0.08	0.05	**46.2**
Chloride	mg/L	0.5	4.5	4.6	2.2
Total Cyanide	mg/L	0.001	<0.001	<0.001	0.0
Cyanide WAD	mg/L	0.001	<0.001	<0.001	0.0
Fluoride	mg/L	0.01	0.09	0.1	10.5
Sulphate	mg/L	0.6	16	13.4	17.7
Thiosulfates	mg/L	0.02	<0.02	<0.02	0.0
Thiocyanates	mg/L	0.05	<0.05	<0.05	0.0
Nutrients and Chlorophyll a					
Nitrate	mg/L	0.01	0.01	0.01	0.0
Nitrite	mg/L	0.01	<0.01	<0.01	0.0
Ammonia Nitrogen	mg/L	0.01	<0.01	<0.01	0.0
Ammonia (NH3)	mg/L	0.01	<0.01	0.01	0.0
Total Kjeldahl nitrogen	mg/L	0.05	0.18	0.19	5.4
Orthophosphate	mg/L	0.01	<0.01	<0.01	0.0
Chlorophyll a	ug/L	0.04	0.55	0.04	*172.9*
Colour	CU	1	<1	<1	0.0
Total Metals					
Aluminum	mg/L	0.005	0.153	0.013	*168.7*
Antimony	mg/L	0.0001	<0.0001	<0.0001	0.0
Arsenic	mg/L	0.0005	<0.0005	<0.0005	0.0
Barium	mg/L	0.0005	0.0024	0.003	**22.2**
Beryllium	mg/L	0.0005	<0.0005	<0.0005	0.0
Boron	mg/L	0.01	<0.01	<0.01	0.0
Cadmium	mg/L	0.00002	<0.00002	<0.00002	0.0
Calcium	mg/L	0.0006	9.38	<0.0006	*200.0*
Chromium	mg/L	0.0006	<0.0006	<0.0006	0.0
Copper	mg/L	0.0005	0.0433	0.001	*191.0*
Iron	mg/L	0.01	<0.01	0.02	**66.7**
Lead	mg/L	0.00003	0.0013	<0.0003	*191.0*
Lithium	mg/L	0.005	<0.005	<0.005	0.0
Magnesium	mg/L	0.02	2.61	2.54	2.7
Manganese	mg/L	0.0005	0.0009	0.0029	**105.3**
Mercury	mg/L	0.00001	<0.00005	<0.00005	0.0
Molybdenum	mg/L	0.0005	<0.0005	<0.0005	0.0
Nickel	mg/L	0.0005	<0.0005	0.0009	**57.1**
Potassium	mg/L	0.05	1.17	1.14	2.6
Selenium	mg/L	0.0005	<0.0005	0.0006	18.2
Silver	mg/L	0.0001	<0.0001	<0.0001	0.0
Strontium	mg/L	0.005	0.046	0.055	17.8
Tellurium	mg/L	0.0005	<0.0005	<0.0005	0.0
Thallium	mg/L	0.0002	<0.0002	<0.0002	0.0
Tin	mg/L	0.001	<0.001	<0.001	0.0
Titanium	mg/L	0.01	0.01	0.01	0.0
Uranium	mg/L	0.001	<0.001	<0.001	0.0
Vanadium	mg/L	0.0005	<0.0005	<0.0005	0.0
Zinc	mg/L	0.001	0.026	<0.001	*185.2*
Dissolved Metals					
Aluminum	mg/L	0.005	0.015	0.028	**60.5**
Antimony	mg/L	0.0001	<0.0001	<0.0001	0.0
Arsenic	mg/L	0.0005	<0.0005	<0.0005	0.0
Barium	mg/L	0.0005	0.0048	0.0034	**34.1**
Beryllium	mg/L	0.0005	<0.0005	<0.0005	0.0
Boron	mg/L	0.01	<0.01	<0.01	0.0
Cadmium	mg/L	0.00002	<0.00002	<0.00002	0.0
Chromium	mg/L	0.0006	<0.0006	<0.0006	0.0
Cobalt	mg/L	0.0005	<0.0005	<0.0005	0.0
Copper	mg/L	0.0005	<0.0005	0.0007	**33.3**

Iron	mg/L	0.01	0.03	<0.01	**100.0**
Lead	mg/L	0.0003	<0.0003	0.0005	**50.0**
Lithium	mg/L	0.005	<0.005	<0.005	0.0
Magnesium	mg/L	0.02	2.65	2.76	4.1
Manganese	mg/L	0.0005	0.0024	0.0008	**100.0**
Mercury	mg/L	0.00001	<0.00001	<0.00001	0.0
Molybdenum	mg/L	0.0005	<0.0005	<0.0005	0.0
Nickel	mg/L	0.0005	<0.0005	0.0006	18.2
Selenium	mg/L	0.0005	0.0008	<0.0005	**46.2**
Silver	mg/L	0.0001	<0.0001	<0.0001	0.0
Strontium	mg/L	0.005	0.047	0.045	4.3
Thallium	mg/L	0.0002	<0.0002	<0.0002	0.0
Tin	mg/L	0.001	<0.001	<0.001	0.0
Titanium	mg/L	0.01	<0.01	0.01	0.0
Uranium	mg/L	0.001	<0.001	<0.001	0.0
Vanadium	mg/L	0.0005	<0.0005	<0.0005	0.0
Zinc	mg/L	0.001	0.001	0.001	0.0

Footnotes:
NA: missing data
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 2018 Hatch meter calibration datasheets

Meadowbank 2018 Hatch meter calibration datasheets				
Date	Standard	Initial reading	Final reading	Verify Cal #
yyyy/mm/dd		NTU	NTU	NTU
2018-01-01	20	20.3	20.50	10.1
	100	98.6	101.00	
	800	808.0	796.00	
2018-01-02	20	19.8	20.00	10.1
	100	98.8	101.00	
	800	802.0	798.00	
2018-01-03	20	20.2	20.30	10.2
	100	99.3	101.00	
	800	798.0	797.00	
2018-01-04	20	20.6	20.40	10.6
	100	105.0	99.60	
	800	807.0	792.00	
2018-01-05	20	19.4	20.30	10.3
	100	95.2	103.00	
	800	791.0	796.00	
2018-01-06	20	19.6	20.40	10.2
	100	96.4	102.00	
	800	795.0	801.00	
2018-01-07	20	20.6	20.20	10.1
	100	104.0	100.00	
	800	808.0	793.00	
2018-01-08	20	19.7	20.30	10.2
	100	98.4	101.00	
	800	793.0	796.00	
2018-01-09	20	20.0	20.00	10.1
	100	102.0	98.90	
	800	802.0	789.00	
2018-01-10	20	20.6	20.10	10.4
	100	99.0	103.00	
	800	788.0	790.00	
2018-01-11	20	20.4	19.90	10.2
	100	101.0	99.50	
	800	787.0	798.00	
2018-01-12	20	19.6	20.90	10.4
	100	98.0	101.00	
	800	793.0	798.00	
2018-01-13	20	20.9	20.50	10.5
	100	101.0	99.90	
	800	794.0	805.00	
2018-01-14	20	20.3	20.20	10.2
	100	99.6	100.00	
	800	787.0	796.00	
2018-01-15	20	20.0	19.90	10.3
	100	101.0	99.30	
	800	786.0	802.00	

	20	19.9	19.80	
2018-01-16	100	99.0	101.00	10.0
	800	795.0	788.00	
	20	20.6	20.00	
2018-01-17	100	101.0	99.10	10.4
	800	784.0	796.00	
	20	19.9	19.90	
2018-01-18	100	99.8	99.60	10.1
	800	798.0	802.00	
	20	19.8	20.10	
2018-01-19	100	99.6	99.90	10.3
	800	798.0	800.00	
	20	19.6	20.20	
2018-01-20	100	98.4	100.00	10.6
	800	797.0	799.00	
	20	20.4	20.50	
2018-01-21	100	99.1	98.60	10.1
	800	800.0	798.00	
	20	19.9	20.30	
2018-01-22	100	103.0	98.90	10.4
	800	806.0	801.00	
	20	20.2	20.80	
2018-01-23	100	98.3	101.00	10.4
	800	804.0	795.00	
	20	20.0	19.80	
2018-01-25	100	99.9	100.00	10.2
	800	814.0	801.00	
	20	20.5	19.90	
2018-01-26	100	100.0	98.70	10.3
	800	792.0	796.00	
	20	19.5	20.20	
2018-01-27	100	100.0	99.10	10.5
	800	805.0	793.00	
	20	20.4	20.80	
2018-01-28	100	98.2	100.00	10.2
	800	789.0	804.00	
	20	20.5	19.80	
2018-01-29	100	97.0	99.90	10.0
	800	799.0	805.00	
	20	19.9	20.00	
2018-01-30	100	102.0	98.90	10.4
	800	808.0	794.00	
	20	20.5	20.40	
2018-01-31	100	99.0	99.40	10.4
	800	785.0	789.00	
	20	20.3	20.00	
2018-02-01	100	98.2	100.00	10.1
	800	780.0	789.00	
	20	19.7	19.70	
2018-02-03	100	99.8	99.80	10.8
	800	810.0	798.00	
	20	20.5	20.30	

2018-02-04	100	100.0	99.40	10.4
	800	781.0	793.00	
	20	19.5	20.70	
2018-02-05	100	100.0	98.10	10.7
	800	799.0	785.00	
	20	21	19.8	
2018-02-06	100	99	99.4	9.6
	800	797	802.0	
	20	20	20.5	
2018-02-07	100	101	101.0	10.3
	800	785	791.0	
	20	20	20.1	
2018-02-08	100	98	99.6	10.6
	800	790	790.0	
	20	20	20.4	
2018-02-09	100	100	101.0	10.9
	800	791	786.0	
	20	22	20.3	
2018-02-10	100	100	99.7	10.4
	800	791	786.0	
	20	20.7	20.70	
2018-02-15	100	100.0	102.00	10.5
	800	789.0	803.00	
	20	20.0	20.20	
2018-02-16	100	97.0	102.00	10.5
	800	797.0	804.00	
	20	20.6	19.90	
2018-02-17	100	101.0	99.90	10.4
	800	811.0	800.00	
	20	19.8	21.00	
2018-02-18	100	99.7	99.80	10.4
	800	794.0	799.00	
	20	20.2	20.50	
2018-02-19	100	98.8	99.70	10.6
	800	805.0	794.00	
	20	20.2	20.40	
2018-02-20	100	98.5	101.00	10.3
	800	789.0	797.00	
	20	20.2	20.00	
2018-02-21	100	99.5	97.70	10.4
	800	787.0	797.00	
	20	20.7	20.60	
2018-02-22	100	99.2	102.00	10.6
	800	804.0	801.00	
	20	20.4	19.80	
2018-02-23	100	100.0	101.00	10.4
	800	787.0	798.00	
	20	20.3	19.80	
2018-02-25	100	101.0	101.00	9.0
	800	808.0	793.00	
	20	19.5	20.50	
2018-02-26	100	101.0	100.00	10.2

	800	802.0	793.00	
	20	21.5	20.50	
2018-02-27	100	98.1	100.00	10.5
	800	775.0	789.00	
	20	20.4	19.80	
2018-02-28	100	102.0	100.00	10.3
	800	789.0	789.00	
	20	19.8	20.10	
2018-03-01	100	101.0	99.70	10.5
	800	788.0	780.00	
	20	21.1	20.30	
2018-03-02	100	103.0	100.00	10.2
	800	798.0	788.00	
	20	20.4	20.20	
2018-03-03	100	100.0	99.70	10.8
	800	791.0	799.00	
	20	20.8	20.20	
2018-03-04	100	99.4	101.00	10.3
	800	803.0	809.00	
	20	20.6	20.20	
2018-03-05	100	100.0	99.60	10.4
	800	780.0	794.00	
	20	20.8	19.80	
2018-03-06	100	98.8	101.00	10.3
	800	800.0	791.00	
	20	19.6	20.20	
2018-03-07	100	99.1	98.70	10.0
	800	795.0	798.00	
	20	19.7	20.10	
2018-03-08	100	99.2	98.90	10.0
	800	797.0	799.00	
	20	19.7	20.30	
2018-03-10	100	99.8	101.00	10.3
	800	784.0	800.00	
	20	21.3	20.40	
2018-03-11	100	100.0	99.60	9.7
	800	780.0	790.00	
	20	21.9	19.80	
2018-03-13	100	98.2	100.00	10.3
	800	790.0	788.00	
	20	17.0	19.10	
2018-03-15	100	96.8	98.70	9.4
	800	787.0	798.00	
	20	19.2	21.10	
2018-03-16	100	100.0	100.00	10.6
	800	797.0	793.00	
	20	19.6	20.40	
2018-03-17	100	101.0	100.00	10.5
	800	796.0	787.00	
	20	22.2	18.30	
2018-03-19	100	100.0	101.00	9.4
	800	792.0	806.00	

	20	18.6	20.30	
2018-03-21	100	102.0	100.00	10.4
	800	817.0	805.00	
	20	20.5	20.50	
2018-03-22	100	101.0	99.80	10.7
	800	796.0	796.00	
	20	20.5	20.20	
2018-03-23	100	98.4	100.00	10.0
	800	885.0	794.00	
	20	20.0	20.30	
2018-03-24	100	99.6	101.00	10.3
	800	822.0	795.00	
	20	20.6	20.50	
2018-03-25	100	100.0	99.70	10.6
	800	789.0	796.00	
	20	20.5	19.60	
2018-03-26	100	101.0	100.00	10.3
	800	794.0	796.00	
	20	19.8	20.10	
2018-03-27	100	99.2	99.50	9.9
	800	795.0	814.00	
Blizzard from the 28 to the 30th				
	20	21.0	20.10	
2018-03-31	100	99.8	100.00	10.3
	800	790.0	805.00	
	20	20.1	20.20	
2018-04-01	100	100.0	99.10	10.7
	800	794.0	797.00	
	20	20.7	19.30	
2018-04-02	100	99.7	99.60	10.2
	800	802.0	797.00	
	20	19.3	20.30	
2018-04-03	100	98.2	102.00	10.5
	800	791.0	787.00	
	20	21.0	20.20	
2018-04-04	100	98.7	100.00	10.5
	800	784.0	794.00	
	20	19.5	21.30	
2018-04-06	100	97.0	101.00	10.7
	800	788.0	793.00	
	20	21.7	20.00	
2018-04-07	100	100.0	99.10	10.5
	800	795.0	795.00	
	20	19.6	19.00	
2018-04-08	100	97.9	102.00	10.3
	800	796.0	799.00	
	20	20.9	20.30	
2018-04-09	100	103.0	99.90	10.3
	800	818.0	789.00	
	20	20.0	20.10	
2018-04-12	100	98.6	99.30	10.5
	800	799.0	794.00	

	20	19.6	20.50	
2018-04-13	100	98.5	99.80	10.7
	800	795.0	792.00	
	20	21.1	19.90	
2018-04-16	100	98.8	102.00	10.1
	800	803.0	780.00	
	20	19.4	20.10	
2018-04-17	100	101.0	99.10	10.5
	800	793.0	791.00	
	20	20.1	20.10	
2018-04-18	100	101.0	97.80	10.4
	800	808.0	799.00	
	20	20.3	19.70	
2018-04-19	100	99.7	97.90	10.3
	800	804.0	799.00	
	20	20.4	19.80	
2018-04-20	100	102.0	98.70	10.0
	800	798.0	798.00	
	20	22.9	19.20	
2018-04-21	100	99.4	101.00	8.6
	800	804.0	785.00	
	20	17.0	21.00	
2018-04-22	100	102.0	99.60	11.0
	800	797.0	810.00	
	20	20.7	19.90	
2018-04-23	100	98.6	99.70	10.3
	800	800.0	788.00	
	20	19.3	20.00	
2018-04-25	100	99.8	98.50	10.4
	800	796.0	790.00	
	20	20.0	19.60	
2018-04-26	100	99.3	101.00	10.6
	800	802.0	793.00	
	20	19.7	20.20	
2018-04-28	100	98.8	100.00	10.4
	800	797.0	793.00	
	20	19.7	20.10	
2018-04-29	100	101.0	98.70	10.9
	800	798.0	802.00	
	20	20.3	19.60	
2018-04-30	100	102.0	99.00	10.4
	800	792.0	785.00	
	20	21.0	20.60	
2018-05-01	100	101.0	102.00	10.5
	800	791.0	799.00	
	20	20.1	21.20	
2018-05-03	100	100.0	99.60	10.9
	800	805.0	787.00	
	20	20.5	20.30	
2018-05-04	100	99.1	100.00	10.5
	800	795.0	799.00	
	20	20.3	20.20	

2018-05-05	100	99.6	99.20	10.4
	800	795.0	803.00	
	20	19.6	20.30	
2018-05-06	100	99.5	100.00	10.0
	800	799.0	798.00	
	20	20.0	19.70	
2018-05-07	100	99.8	99.30	10.1
	800	819.0	797.00	
	20	19.6	20.10	
2018-05-08	100	98.4	98.80	10.4
	800	794.0	799.00	
	20	19.3	20.30	
2018-05-09	100	99.1	98.30	10.4
	800	797.0	805.00	
	20	19.8	20.10	
2018-05-10	100	98.6	98.20	10.4
	800	804.0	801.00	
	20	20.4	19.90	
2018-05-11	100	101.0	101.00	10.5
	800	800.0	801.00	
	20	20.1	20.00	
2018-05-12	100	98.9	100.00	10.4
	800	801.0	799.00	
	20	19.6	20.30	
2018-05-13	100	99.3	99.80	10.3
	800	792.0	804.00	
	20	19.2	19.40	
2018-05-14	100	99.7	101.00	10.3
	800	804.0	797.00	
	20	20.2	20.20	
2018-05-15	100	99.6	99.60	10.5
	800	795.0	801.00	
	20	19.8	20.60	
2018-05-16	100	101.0	101.00	10.1
	800	804.0	808.00	
	20	19.6	19.30	
2018-05-17	100	101.0	100.00	10.5
	800	802.0	798.00	
	20	20.9	20.20	
2018-05-18	100	99.7	99.90	10.4
	800	794.0	804.00	
	20	20.9	20.00	
2018-05-19	100	102.0	99.00	9.7
	800	796.0	794.00	
	20	19.9	20.30	
2018-05-20	100	101.0	98.90	11.1
	800	790.0	799.00	
	20	20.0	21.00	
2018-05-21	100	99.1	99.30	10.3
	800	794.0	799.00	
	20	20.6	20.40	
2018-05-22	100	98.7	102.00	10.2

	800	779.0	805.00	
	20	21.6	21.00	
2018-05-23	100	101.0	100.00	10.2
	800	781.0	788.00	
	20	21.1	20.60	
2018-05-24	100	101.0	101.00	10.2
	800	794.0	792.00	
	20	23.2	21.50	
2018-05-25	100	103.0	99.80	10.4
	800	794.0	793.00	
	20	20.6	20.50	
2018-05-26	100	98.5	99.00	10.4
	800	781.0	792.00	
	20	20.9	20.70	
2018-05-27	100	99.0	99.00	10.6
	800	787.0	788.00	
	20	20.4	20.80	
2018-05-28	100	100.0	100.00	10.3
	800	780.0	799.00	
	20	20.6	19.90	
2018-05-29	100	100.0	99.30	9.9
	800	799.0	788.00	
	20	19.9	20.40	
2018-05-30	100	99.8	100.00	10.3
	800	788.0	797.00	
	20	20.3	20.40	
2018-05-31	100	99.6	101.00	10.3
	800	800.0	795.00	
	20	20.1	20.10	
2018-06-01	100	99.9	99.80	9.95
	800	791.0	806.00	
	20	20.2	20.20	
2018-06-02	100	101.0	101.00	10.00
	800	800.0	802.00	
	20	19.8	20.00	
2018-06-03	100	100.0	99.90	10.30
	800	797.0	808.00	
	20	20.1	20.10	
2018-06-04	100	98.0	99.80	10.10
	800	795.0	795.00	
	20	19.8	19.80	
2018-06-05	100	99.4	98.90	10.30
	800	802.0	801.00	
	20	19.7	19.90	
2018-06-06	100	102.0	101.00	10.20
	800	795.0	795.00	
	20	20.2	20.30	
2018-06-07	100	101.0	101.00	10.20
	800	805.0	804.00	
	20	19.5	19.60	
2018-06-08	100	99.6	101.00	10.40
	800	796.0	798.00	

	20	21.8	18.70	
2018-06-09	100	97.9	101.00	9.14
	800	800.0	793.00	
	20	19.6	19.60	
2018-06-10	100	101.0	100.00	10.10
	800	805.0	794.00	
	20	19.6	19.70	
2018-06-11	100	101.0	99.10	10.40
	800	795.0	792.00	
	20	20.6	19.30	
2018-06-12	100	103.0	98.00	9.24
	800	797.0	796.00	
	20	19.8	19.30	
2018-06-13	100	98.1	99.40	10.50
	800	809.0	806.00	
	20	20.0	19.10	
2018-06-14	100	98.9	99.70	9.72
	800	799.0	791.00	
	20	20.7	18.90	
2018-06-15	100	102.0	99.90	9.68
	800	787.0	787.00	
	20	19.6	20.50	
2018-06-16	100	103.0	101.00	10.3
	800	814.0	790.00	
	20	20.1	20.10	
2018-06-17	100	97.6	99.90	10.4
	800	791.0	776.00	
	20	20.1	19.50	
2018-06-18	100	99.6	101.00	9.96
	800	786.0	788.00	
	20	20.2	20.50	
2018-06-19	100	99.0	99.00	10.2
	800	794.0	801.00	
	20	21.2	19.80	
2018-06-20	100	101.0	101.00	10.0
	800	788.0	794.00	
	20	20.5	20.30	
2018-06-21	100	103.0	98.50	10.1
	800	792.0	793.00	
	20	19.8	19.80	
2018-06-22	100	101.0	100.00	10.2
	800	796.0	800.00	
	20	20.0	19.80	
2018-06-23	100	100.0	101.00	10.2
	800	787.0	794.00	
	20	20.1	19.50	
2018-06-24	100	101.0	99.50	10.3
	800	801.0	797.00	
	20	20.4	20.50	
2018-06-25	100	102.0	100.00	10.4
	800	794.0	802.00	
	20	21.3	20.10	

2018-06-26	100	105.0	99.90	10.5
	800	793.0	793.00	
	20	20.5	19.00	
2018-06-27	100	102.0	100.00	9.72
	800	792.0	795.00	
	20	19.7	20.80	
2018-06-28	100	103.0	99.00	10.7
	800	786.0	792.00	
	20	21.1	19.00	
2018-06-29	100	101.0	99.10	10.0
	800	795.0	805.00	
	20	18.6	20.50	
2018-06-30	100	101.0	99.90	10.6
	800	789.0	796.00	
	20	21.0	20.40	
2018-07-01	100	98.8	103.00	10.2
	800	798.0	792.00	
	20	19.3	20.20	
2018-07-02	100	99.9	102.00	10.4
	800	806.0	804.00	
	20	20.0	20.00	
2018-07-03	100	101.0	99.80	10.2
	800	802.0	804.00	
	20	20.4	20.60	
2018-07-04	100	100.0	102.00	10.1
	800	798.0	798.00	
	20	19.8	19.80	
2018-07-05	100	100.0	100.00	10.3
	800	796.0	796.00	
	20	19.8	20,5	
2018-07-06	100	104.0	94.50	10.3
	800	804.0	793.00	
	20	19.9	19.80	
2018-07-07	100	95.1	96.50	10.2
	800	795.0	802.00	
	20	20.8	19.90	
2018-07-08	100	98.8	97.60	10.1
	800	806.0	799.00	
	20	19.8	19.30	
2018-07-09	100	100.0	99.80	10.0
	800	802.0	790.00	
	20	19.4	19.90	
2018-07-10	100	100.0	98.60	10.4
	800	799.0	784.00	
	20	20.0	19.60	
2018-07-11	100	103.0	93.60	9.0
	800	786.0	791.00	
	20	19.9	20.10	
2018-07-12	100	95.9	99.30	10.2
	800	799.0	791.00	
	20	21.0	20.60	
2018-07-13	100	101.0	99.10	10.4

	800	817.0	800.00	
	20	19.4	20.40	
2018-07-14	100	96.4	101.00	10.4
	800	800.0	793.00	
	20	22.3	19.10	
2018-07-15	100	103.0	98.50	9.71
	800	798.0	796.00	
	20	20.5	19.70	
2018-07-16	100	102.0	99.70	10.1
	800	795.0	797.00	
	20	19.9	20.40	
2018-07-17	100	97.9	99.20	9.97
	800	794.0	787.00	
	20	20.9	19.80	
2018-07-18	100	102.0	98.10	10.1
	800	792.0	792.00	
	20	20.9	19.90	
2018-07-19	100	98.2	101.00	10.1
	800	804.0	799.00	
	20	19.8	19.90	
2018-07-20	100	104.0	97.30	9.7
	800	797.0	799.00	
	20	21.0	19.80	
2018-07-21	100	98.9	101.00	9.7
	800	793.0	804.00	
	20	19.8	20.20	
2018-07-22	100	100.0	100.00	9.9
	800	793.0	796.00	
	20	20.8	20.50	
2018-07-23	100	101.0	105.00	10.0
	800	792.0	789.00	
	20	20.4	20.30	
2018-07-24	100	103.0	99.40	10.2
	800	794.0	796.00	
	20	21.3	19.90	
2018-07-25	100	103.0	99.50	10.1
	800	793.0	795.00	
	20	20.9	19.40	
2018-07-26	100	101.0	99.40	10.0
	800	791.0	797.00	
	20	19.6	20.10	
2018-07-27	100	99.2	101.00	9.8
	800	794.0	800.00	
	20	19.3	19.90	
2018-07-28	100	98.5	98.40	9.9
	800	797.0	805.00	
	20	19.5	18.90	
2018-07-29	100	100.0	99.80	10.7
	800	807.0	808.00	
	20	21.7	20.70	
2018-07-30	100	103.0	102.00	10.0
	800	804.0	802.00	

2018-07-31	20 100 800	19.6 100.0 803.0	19.60 101.00 801.00	10.2
2018-08-01	20 100 800	19.7 98.4 804.0	19.80 98.50 798.00	10.6
2018-08-02	20 100 800	20.7 99.0 799.0	20.20 100.00 800.00	10.2
2018-08-03				DUSTFALL
2018-08-04	20 100 800	19.9 88.4 796.0	20.40 108.00 791.00	9.9
2018-08-05	20 100 800	20.3 114.0 807.0	20.20 98.00 801.00	10.1
2018-08-06	20 100 800	20.0 97.5 811.0	19.10 99.40 787.00	10.5
2018-08-07	20 100 800	19.9 102.0 803.0	20.50 99.00 792.00	10.3
2018-08-08	20 100 800	20.4 101.0 794.0	20.10 99.40 791.00	9.3
2018-08-09	20 100 800	20.4 98.5 788.0	18.70 98.90 795.00	9.3
2018-08-10	20 100 800	19.5 101.0 794.0	20.50 98.80 796.00	8.8
2018-08-11	20 100 800	22.3 102.0 810.0	19.80 100.00 800.00	10.1
2018-08-12	20 100 800	20.2 101.0 773.0	20.50 98.70 797.00	10.5
2018-08-13	20 100 800	21.8 99.5 787.0	20.00 99.20 799.00	10.4
2018-08-14	20 100 800	20.6 100.0 804.0	20.00 100.00 800.00	10.3
2018-08-15	20 100 800	20.1 98.4 785.0	19.20 99.10 798.00	9.8
2018-08-16	20 100 800	19.5 102.0 809.0	19.70 99.10 790.00	10.6
	20	21.3	21.30	

2018-08-17	100	101.0	100.00	10.3
	800	802.0	799.00	
	20	21.4	20.20	
2018-08-18	100	101.0	102.00	10.0
	800	793.0	784.00	
	20	20.7	20.40	
2018-08-19	100	101.0	99.90	9.8
	800	785.0	796.00	
	20	20.2	19.60	
2018-08-20	100	100.0	101.00	10.5
	800	790.0	792.00	
	20	21.3	20.50	
2018-08-21	100	103.0	99.70	10.5
	800	777.0	792.00	
	20	21.6	21.30	
2018-08-22	100	99.7	99.90	10.2
	800	811.0	786.00	
	20	19.5	20.60	
2018-08-23	100	99.8	103.00	9.3
	800	787.0	792.00	
	20	19.7	20.20	
2018-08-24	100	96.3	96.40	10.1
	800	800.0	808.00	
	20	19.8	20.30	
2018-08-25	100	100.0	99.80	10.2
	800	787.0	795.00	
	20	21.1	20.90	
2018-08-26	100	99.2	101.00	9.58
	800	787.0	797.00	
	20	22.2	20.80	
2018-08-27	100	106.0	99.40	10.8
	800	790.0	794.00	
	20	20.9	20.00	
2018-08-28	100	103.0	99.20	10.5
	800	791.0	790.00	
	20	19.3	19.60	
2018-08-29	100	98.2	99.40	10.0
	800	791.0	792.00	
	20			
	100			
	800			
	20			
	100			
	800			
	20	20.0	20.60	
2018-09-01	100	96.6	99.50	10.0
	800	797.0	801.00	
	20	19.9	20.20	
2018-09-03	100	102.0	102.00	10.2
	800	807.0	799.00	
	20	20.3	20.40	
2018-09-04	100	102.0	98.90	10.8

	800	805.0	799.00	
	20	20.7	20.30	
2018-09-05	100	99.3	98.50	
	800	812.0	810.00	
	20			
2018-09-06	100			
	800			
	20	22.2	20.10	
2018-09-07	100	98.4	99.00	
	800	801.0	793.00	
	20	20.3	19.40	
2018-09-08	100	100.0	98.30	
	800	804.0	791.00	
	20			
2018-09-09	100			
	800			
	20	21.7	20.40	
2018-09-10	100	100.0	98.80	
	800	794.0	794.00	
	20	20.3	20.40	
2018-09-11	100	99.3	99.20	
	800	800.0	789.00	
	20	20.1	19.90	
2018-09-12	100	99.5	100.00	9.96
	800	804.0	786.00	
	20	19.0	20.40	
2018-09-13	100	101.0	98.70	11.4
	800	788.0	798.00	
	20	20.2	20.00	
2018-09-14	100	102.0	102.00	9.83
	800	792.0	802.00	
	20			
2018-09-15	100			
	800			
	20	19.7	20.10	
2018-09-16	100	101.0	99.60	10.3
	800	806.0	792.00	
	20	19.7	19.70	
2018-09-17	100	99.6	98.10	10.1
	800	776.0	792.00	
	20	19.9	20.10	
2018-09-18	100	103.0	99.40	10.4
	800	803.0	786.00	
	20	19.6	20.50	
2018-09-19	100	97.0	102.00	10.3
	800	804.0	789.00	
	20	20.4	20.20	
2018-09-20	100	102.0	99.90	9.89
	800	790.0	789.00	
	20	19.9	20.00	
2018-09-21	100	99.2	100.00	9.92
	800	796.0	800.00	

	20	19.9	19.60	
2018-09-22	100	99.3	100.00	9.7
	800	783.0	798.00	
	20	20.4	20.10	
2018-09-23	100	98.9	98.30	10.7
	800	801.0	795.00	
	20	20.6	20.60	
2018-09-24	100	99.5	105.00	9.09
	800	795.0	805.00	
	20	18.5	19.70	
2018-09-25	100	95.9	97.60	9.4
	800	785.0	805.00	
	20	19.5	19.70	
2018-09-26	100	98.4	99.10	10.1
	800	786.0	792.00	
	20	20.2	20.00	
2018-09-27	100	98.1	102.00	9.7
	800	795.0	783.00	
	20	20.3	19.30	
2018-09-28	100	101.0	100.00	10.2
	800	786.0	811.00	
	20	19.3	20.30	
2018-09-29	100	98.5	101.00	10.3
	800	813.0	793.00	
	20	20.4	198.00	
2018-10-01	100	102.0	99.90	10.3
	800	804.0	792.00	
	20	19.8	20.20	
2018-10-02	100	100.0	100.00	10.5
	800	804.0	783.00	
	20	20.0	20.30	
2018-10-03	100	100.0	101.00	10.2
	800	801.0	786.00	
	20	20.0	20.30	
2018-10-04	100	98.6	101.00	10.1
	800	788.0	796.00	
	20	20.2	20.80	
2018-10-05	100	105.0	101.00	10.4
	800	795.0	794.00	
	20	20.4	19.50	
2018-10-06	100	102.0	100.00	10.4
	800	821.0	802.00	
	20	20.0	19.90	
2018-10-07	100	100.0	101.00	10.5
	800	778.0	792.00	
	20	20.1	20.00	
2018-10-08	100	99.1	101.00	10.2
	800	803.0	784.00	
	20	21.2	20.10	
2018-10-09	100	102.0	97.80	10.2
	800	785.0	780.00	
	20	20.0	19.90	

2018-10-10	100	98.8	97.60	10.4
	800	788.0	799.00	
	20	19.8	20.20	
2018-10-11	100	101.0	101.00	10.0
	800	788.0	796.00	
	20	19.3	19.90	
2018-10-11	100	99.2	101.00	9.77
	800	801.0	809.00	
	20	19.3	19.90	
2018-10-12	100	99.2	101.00	9.77
	800	801.0	809.00	
	20	20.0	19.40	
2018-10-13	100	98.8	99.80	10.10
	800	785.0	797.00	
	20	19.9	19.30	
2018-10-14	100	99.3	100.00	9.84
	800	794.0	806.00	
	20	19.7	20.30	
2018-10-15	100	99.8	101.00	9.99
	800	783.0	801.00	
	20	19.7	19.60	
2018-10-16	100	98.5	99.30	10.20
	800	794.0	799.00	
	20	19.5	19.70	
2018-10-17	100	99.0	99.10	10.40
	800	794.0	800.00	
	20	20.1	20.00	
2018-10-18	100	101.0	99.80	10.10
	800	796.0	791.0	
	20	19.4	20.20	
2018-10-19	100	97.3	100.00	10.00
	800	789.0	800.0	
	20	20.2	19.60	
2018-10-20	100	99.7	101.00	10.30
	800	806.0	810.0	
	20	20.2	20.40	
2018-10-21	100	103.0	101.00	10.10
	800	801.0	800.0	
	20	20.2	20.20	
2018-10-22	100	101.0	101.00	10.60
	800	798.0	797.0	
	20	20.1	20.00	
2018-10-23	100	99.9	100.00	10.10
	800	804.0	788.0	
	20	19.9	20.10	
2018-10-24	100	97.0	101.00	9.89
	800	791.0	799.0	
	20	20.0	20.30	
2018-10-25	100	101.0	99.90	10.00
	800	798.0	791.0	
	20	20.1	19.60	
2018-10-26	100	103.0	100.00	10.30

	800	788.0	780.0	
	20	19.0	20.00	
2018-10-27	100	97.4	101.00	10.80
	800	785.0	798.0	
	20	20.4	20.00	
2018-10-28	100	99.2	99.80	10.50
	800	790.0	794.0	
	20	19.6	20.90	
2018-10-29	100	99.1	101.00	10.50
	800	803.0	794.0	
	20	20.9	19.80	
2018-10-30	100	101.0	101.00	10.50
	800	803.0	800.0	
	20	18.1	20.90	
2018-10-31	100	102.0	98.40	10.30
	800	811.0	791.0	
	20	19.6	20.60	
2018-11-01	100	100.0	99.70	10.4
	800	794.0	798.00	
	20	20.2	19.20	
2018-11-02	100	99.3	101.00	10.2
	800	790.0	791.00	
	20	19.2	19.60	
2018-11-03	100	103.0	99.80	10.5
	800	798.0	797.00	
	20	19.7	20.20	
2018-11-04	100	98.0	99.70	10.5
	800	792.0	800.00	
	20	19.9	19.70	
2018-11-05	100	101.0	99.40	10.4
	800	798.0	794.00	
	20	19.8	20.30	
2018-11-06	100	101.0	99.60	10.6
	800	796.0	791.00	
	20	19.9	20.10	
2018-11-07	100	99.5	98.90	10.1
	800	799.0	796.00	
	20	19.7	20.00	
2018-11-08	100	99.9	101.00	10.4
	800	792.0	797.00	
	20	20.0	20.10	
2018-11-09	100	102.0	99.80	10.4
	800	800.0	793.00	
	20	20.3	20.00	
2018-11-10	100	99.9	98.50	10.4
	800	800.0	796.00	
	20	19.8	20.20	
2018-11-11	100	98.4	100.00	10.7
	800	795.0	789.00	
	20	20.4	20.30	
2018-11-12	100	102.0	101.00	10.2
	800	810.0	789.00	

	20	20..2	20.00	
2018-11-13	100	100.0	98.90	10.6
	800	791.0	801.00	
	20	20.5	20.20	
2018-11-14	100	99.2	99.60	10.5
	800	804.0	784.00	
	20	20.2	20.40	
2018-11-15	100	102.0	98.90	10.5
	800	803.0	801.00	
	20	19.9	20.60	
2018-11-16	100	99.1	101.00	10.5
	800	779.0	784.00	
	20	20.4	19.70	
2018-11-17	100	97.5	101.00	10.1
	800	798.0	783.00	
	20	19.6	20.10	
2018-11-18	100	101.0	100.00	10.3
	800	803.0	789.00	
	20	20.2	21.00	
2018-11-19	100	98.7	99.20	10.3
	800	791.0	804.00	
	20	20.0	20.00	
2018-11-20	100	98.8	101.00	9.9
	800	800.0	799.00	
	20	20.2	20.30	
2018-11-21	100	104.0	102.00	10.1
	800	791.0	804.00	
	20	20.9	20.10	
2018-11-22	100	101.0	99.70	10.5
	800	807.0	793.00	
	20	20.2	19.80	
2018-11-23	100	97.4	98.40	10.3
	800	794.0	802.00	
	20	20.6	20.00	
2018-11-24	100	102.0	99.10	9.9
	800	804.0	797.00	
	20	20.2	19.90	
2018-11-25	100	99.5	99.10	10.0
	800	795.0	801.00	
	20	20.4	19.90	
2018-11-26	100	103.0	98.90	10.1
	800	796.0	798.00	
	20	19.4	20.10	
2018-11-27	100	97.8	100.80	10.4
	800	807.0	799.00	
	20	20.5	19.20	
2018-11-28	100	102.0	98.60	9.5
	800	774.0	806.00	
	20	19.0	20.30	
2018-11-29	100	97.9	100.00	10.1
	800	804.0	802.00	
	20	21.2	19.90	

2018-11-30	100	104.0	103.00	9.48
	800	786.0	794.00	
	20			
2018-12-01	100			
	800			
	20			
2018-12-02	100			
	800			
	20			
2018-12-03	100			
	800			
	20	19.4	20.10	
2018-12-04	100	104.0	102.00	10.3
	800	807.0	797.00	
	20	20.2	20.00	
2018-12-05	100	103.0	99.60	10.0
	800	795.0	806.00	
	20	20.5	19.70	
2018-12-06	100	100.0	99.70	10.2
	800	795.0	795.00	
	20	20.1	20.10	
2018-12-07	100	101.0	99.10	10.2
	800	793.0	797.00	
	20	19.6	19.60	
2018-12-08	100	99.1	98.70	9.87
	800	788.0	801.00	
	20	19.3	20.30	
2018-12-09	100	100.0	100.00	10.4
	800	791.0	798.00	
	20			
2018-12-10	100			
	800			
	20	20.8	19.50	
2018-12-11	100	99.2	99.30	10.2
	800	797.0	806.00	
	20	20.5	20.20	
2018-12-12	100	100.0	101.00	10.2
	800	788.0	797.00	
	20	19.8	20.20	
2018-12-13	100	97.1	101.00	9.8
	800	786.0	796.00	
	20	19.7	20.20	
2018-12-14	100	104.0	100.00	10.6
	800	811.0	796.00	
	20	21.4	19.20	
2018-12-15	100	103.0	97.30	10.1
	800	805.0	793.00	
	20	18.3	21.10	
2018-12-16	100	95.6	101.00	10.7
	800	801.0	792.00	
	20	20.1	20.30	
2018-12-17	100	99.2	101.00	10.7

	800	788.0	791.00	
	20	21.2	20.80	
2018-12-18	100	102.0	99.20	9.7
	800	802.0	790.00	
	20	19.6	20.50	
2018-12-19	100	102.0	102.00	10.3
	800	818.0	793.00	
	20	19.7	20.10	
2018-12-20	100	96.2	101.00	10.4
	800	789.0	789.00	
	20	20.8	20.30	
2018-12-21	100	104.0	99.90	10.4
	800	808.0	803.00	
	20	19.7	20.50	
2018-12-22	100	96.5	101.00	10.3
	800	808.0	781.00	
	20	20.3	20.00	
2018-12-23	100	101.0	100.00	9.9
	800	784.0	800.00	
	20	19.7	19.90	
2018-12-24	100	99.4	101.00	10.9
	800	808.0	776.00	
	20	19.8	20.70	
2018-12-25	100	99.2	101.00	10.4
	800	792.0	781.00	
	20	20.3	20.00	
2018-12-26	100	101.0	99.60	10.0
	800	796.0	805.00	
	20	20.2	19.60	
2018-12-27	100	103.0	101.00	10.3
	800	815.0	797.00	
	20	20.4	20.60	
2018-12-28	100	99.6	101.00	10.3
	800	795.0	801.00	
	20	20.2	20.20	
2018-12-29	100	101.0	101.00	9.91
	800	795.0	801.00	
	20	20.4	19.80	
2018-12-30	100	98.7	99.30	10.0
	800	796.0	798.00	
	20	19.7	20.30	
2018-12-31	100	98.4	98.40	9.8
	800	776.0	799.00	

Table 8.89: Meadowbank 2018 Oakton PCS35 calibration datasheets

Meadowbank 2018 Oakton PCS35 calibration datasheets						
Date	**Standard**	**pH (initial reading)**	**pH (final reading)**	**Standard**	**Conductivity (initial reading)**	**Conductivity (final reading)**
1-Jan-18	4.00 7.00 10.00	4.04 7.00 10.13	4.01 7.05 10.05	1413	1404	1416
2-Jan-18	4.00 7.00 10.00	4.08 7.10 9.93	3.99 7.02 10.01	1413	1422	1414
4-Jan-18	4.00 7.00 10.00	4.06 7.30 10.18	4.01 7.04 10.05	1413	1298	1412
5-Jan-18	4.00 7.00 10.00	4.09 6.86 10.04	4.02 7.04 10	1413	1426	1413
6-Jan-18	4.00 7.00 10.00	4.07 7.12 9.96	3.99 7.05 10.01	1413	1416	1414
7-Jan-18	4.00 7.00 10.00	4.04 7.14 10.15	4.02 7.01 10.03	1413	1405	1413
8-Jan-18	4.00 7.00 10.00	4.31 7.02 10.21	4 7.04 10.07	1413	1401	1415
9-Jan-18	4.00 7.00 10.00	4.10 7.11 10.06	4.03 7.05 10.02	1413	1442	1416
10-Jan-18	4.00 7.00 10.00	4.04 7.02 9.96	3.99 7.05 10.05	1413	1405	1413
11-Jan-18	4.00 7.00 10.00	4.02 7.06 10.06	4 7.02 10.04	1413	1412	1415
12-Jan-18	4.00 7.00 10.00	4.05 7.03 9.91	4.01 7.04 10.05	1413	1409	1415
13-Jan-18	4.00 7.00 10.00	4.04 6.92 10.07	3.98 7.05 10.05	1413	1434	1414
14-Jan-18	4.00 7.00 10.00	4.03 7.23 10.07	4 7.02 10.04	1413	1417	1414
15-Jan-18	4.00 7.00 10.00	4.04 7.08 10.05	4 7.03 10.03	1413	1406	1413
15-Jan-18	4.00 7.00 10.00	4.09 7.00 10.03	4 7.05 10.05	1413	1409	1411
17-Jan-18	4.00 7.00 10.00	3.97 7.04 10.11	3.99 6.95 10.04	1413	1405	1414
18-Jan-18	4.00 7.00 10.00	4.02 7.03 10.25	4 7.02 10.1	1413	1399	1414
19-Jan-19	4.00 7.00 10.00	4.02 7.01 10.02	4.03 7.03 10.03	1413	1410	1418
20-Jan-18	4.00 7.00	4.01 7.04	4.03 7.02	1413	1408	1415

	10.00	10.03	10.05			
	4.00	4.06	4.04	1413	1410	1411
21-Jan-18	7.00	7.06	7.04			
	10.00	10.00	10.04			
	4.00	4.05	4	1413	1408	1414
22-Jan-18	7.00	7.03	6.97			
	10.00	10.15	10.12			
	4.00	3.68	3.95	1413	1404	1414
23-Jan-18	7.00	7.11	7.02			
	10.00	10.26	10.02			
	4.00	3.66	3.99	1413	1237	1412
25-Jan-18	7.00	6.88	6.97			
	10.00	10.05	10.03			
	4.00	4.04	3.99	1413	1616	1417
26-Jan-18	7.00	6.96	6.99			
	10.00	10.08	10.04			
27-Jan-18	4.00	4.03	4	1413	1411	1413
	7.00	7.00	7.01			
28-Jan-18	4.00	4.05	3.99	1413	1401	1414
	7.00	7.03	7.01			
29-Jan-18	4.00	3.99	4	1413	1371	1409
	7.00	7.02	7.01			
30-Jan-18	4.00	4.07	3.97	1413	1404	1410
	7.00	7.06	7			
31-Jan-18	4.00	4.06	3.99	1413	1390	1413
	7.00	7.07	7.02			
1-Feb-18	4.00	4.05	4	1413	1423	1417
	7.00	7.03	7.02			
3-Feb-18	4.00	4.12	4	1413	1432	1410
	7.00	7.09	7.03			
	4.00	4.04	4.03	1413	1418	1416
4-Feb-18	7.00	7.03	7.03			
	10.00	10.15	10.06			
	4.00	3.95	4.02	1413	1454	1414
7-Feb-18	7.00	6.94	7.05			
	10.00	10.04	10.04			
	4.00	4.02	3.95	1413	1354	1414
8-Feb-18	7.00	7.09	7.01			
	10.00	10.15	10.4			
	4.00	3.97	4	1413	1410	1413
9-Feb-18	7.00	7.03	7.02			
	10.00	10.10	10.03			
	4.00	4.14	4.01	1413	1431	1413
10-Feb-18	7.00	7.07	7.05			
	10.00	10.01	10.4			
	4.00					
11-Feb-18	7.00					
	10.00					
	4.00	4.06	4.01	1413	1400	1413
12-Feb-18	7.00	7.06	7.01			
	10.00	10.00	10			
	4.00	4.09	4.01	1413	1498	1412
13-Feb-18	7.00	7.04	7.01			
	10.00	10.12	10.07			
	4.00	4.11	4.02	1413	1358	1417
14-Feb-18	7.00	6.98	7.02			
	10.00	10.13	10.01			
	4.00	3.97	3.98	1413	1456	1414
15-Feb-18	7.00	6.94	6.96			
	10.00	10.18	10.02			
	4.00	4.04	4.01	1413	1400	1416
16-Feb-18	7.00	7.10	7.03			
	10.00	10.10	10.02			
	4.00	3.98	3.99	1413	1419	1417
17-Feb-18	7.00	6.99	6.93			

	10.00	10.15	10.03			
18-Feb-18	4.00 7.00 10.00	3.98 6.91 10.16	4 6.97 10.04	1413	1396	1414
27-Feb-18				1413	1290	1413
28-Feb-18				1413	1345	1413
1-Mar-18				1413	1352	1416
2-Mar-18				1413	1380	1413
3-Mar-18				1413	1386	1413
4-Mar-18				1413	1381	1411
5-Mar-18				1413	1431	1414
6-Mar-18				1413	1419	1411
10-Mar-18				1413	1430	1413
	Blizzard between March 28 and 30th					
31-Mar-18				1413	1409	1411
1-Apr-18				1413	1370	1413
2-Apr-18				1413	1425	1420
3-Apr-18				1413	1405	1418
4-Apr-18				1413	1414	1415
7-Apr-18				1413	1383	1416
8-Apr-18				1413	1455	1412
9-Apr-18				1413	1429	1413
12-Apr-18				1413	1392	1417
13-Apr-18				1413	1409	1413
16-Apr-18				1413	1377	1417
17-Apr-18				1413	1398	1413
18-Apr-18				1413	1406	1416
19-Apr-18				1413	1411	1415
20-Apr-18				1413	1436	1417
21-Apr-18				1413	1387	1413
22-Apr-18				1413	1447	1411
23-Apr-18				1413	1411	1412
25-Apr-18				1413	1437	1412
26-Apr-18				1413	1402	1414

28-Apr-18	1413	1455	1408
29-Apr-18	1413	1432	1414
30-Apr-18	1413	1411	1412
1-May-18	1413	1445	1414
3-May-18	1413	1376	1412
4-May-18	1413	1408	1415
5-May-18	1413	1421	1413
6-May-18	1413	1388	1415
7-May-18	1413	1453	1414
8-May-18	1413	1422	1414
9-May-18	1413	1386	1412
10-May-18	1413	1410	1413
11-May-18	1413	1395	1413
12-May-18	1413	1393	1416
13-May-18	1413	1418	1412
14-May-18	1413	1387	1414
15-May-18	1413	1395	1413
16-May-18	1413	1406	1414
17-May-18	1413	1402	1415
18-May-18	1413	1402	1412
19-May-18	1413	1136	1411
20-May-18	1413	1395	1413
21-May-18	1413	1386	1411
22-May-18	1413	1417	1414
23-May-18	1413	1362	1412
24-May-18	1413	1453	1415
25-May-18	1413	1394	1422
26-May-18	1413	1382	1418
27-May-18	1413	1419	1417
28-May-18	1413	1419	1417
29-May-18	1413	1405	1413
30-May-18	1413	1422	1414
31-May-18	1413	1433	1415

31-May-18			
1-Jun-18	1413	1401	1416
2-Jun-18	1413	1431	1412
3-Jun-18	1413	1427	1411
4-Jun-18	1413	1395	1414
5-Jun-18	1413	1390	1414
6-Jun-18	1413	1417	1414
7-Jun-18	1413	1389	1414
8-Jun-18	1413	1444	1415
9-Jun-18	1413	1403	1414
10-Jun-18	1413	1421	1413
11-Jun-18	1413	1396	1414
12-Jun-18	1413	1422	1412
13-Jun-18	1413	1408	1413
14-Jun-18	1413	1408	1413
15-Jun-18	1413	1405	1413
16-Jun-18	1413	1426	1417
17-Jun-18	1413	1450	1415
18-Jun-18	1413	1412	1415
19-Jun-18	1413	1433	1415
20-Jun-18	1413	1350	1412
21-Jun-18	1413	1424	1413
22-Jun-18	1413	1267	1415
23-Jun-18	1413	1349	1414
24-Jun-18	1413	1424	1414
25-Jun-18	1413	1397	1416
26-Jun-18	1413	1392	1413
27-Jun-18	1413	1385	1414
28-Jun-18	1413	1394	1414
29-Jun-18	1413	1439	1415
30-Jun-18	1413	1387	1416
1-Jul-18	1413	1421	1413
2-Jul-18	1413	1430	1414

3-Jul-18	1413	1411	1416
4-Jul-18	1413	1384	1414
5-Jul-18	1413	1406	1414
6-Jul-18	1413	1416	1412
7-Jul-18	1413	1407	1417
8-Jul-18	1413	1417	1413
9-Jul-18	1413	1454	1414
10-Jul-18	1413	1378	1411
10-Jul-18	1413	1378	1411
11-Jul-18	1413	1352	1412
12-Jul-18	1413	1424	1413
13-Jul-18	1413	1414	1413
14-Jul-18	1413	1432	1413
15-Jul-18	1413	1417	1413
16-Jul-18	1413	1395	1414
17-Jul-18	1413	1408	1414
18-Jul-18	1413	1410	1415
19-Jul-18	1413	1425	1412
20-Jul-18	1413	1419	1414
21-Jul-18	1413	1426	1413
22-Jul-18	1413	1408	1414
23-Jul-18	1413	1434	1412
24-Jul-18	1413	1396	1413
25-Jul-18	1413	1423	1413
26-Jul-18	1413	1418	1414
27-Jul-18	1413	1427	1414
28-Jul-18	1413	1363	1413
29-Jul-18	1413	1450	1415
30-Jul-18	1413	1418	1416
31-Jul-18	1413	1409	1417
1-Aug-18	1413	1388	1411
2-Aug-18	1413	1403	1417
4-Aug-18	1413	1416	1414

4-Aug-18			
5-Aug-18	1413	1419	1415
6-Aug-18	1413	1399	1413
7-Aug-18	1413	1358	1412
8-Aug-18	1413	1466	1416
9-Aug-18	1413	1312	1412
10-Aug-18	1413	1439	1411
11-Aug-18	1413	1423	1414
12-Aug-18	1413	1399	1416
13-Aug-18	1413	1386	1415
14-Aug-18	1413		
15-Aug-18	1413	1416	1413
16-Aug-18	1413	1424	1412
17-Aug-18	1413	1401	1413
18-Aug-18	1413	1391	1414
19-Aug-18	1413	1443	1414
20-Aug-18	1413	1406	1413
21-Aug-18	1413	1400	1414
22-Aug-18	1413	1420	1414
23-Aug-18	1413	1380	1411
24-Aug-18	1413	1430	1411
25-Aug-18	1413	1338	1412
26-Aug-18	1413	1396	1412
27-Aug-18	1413	1408	1415
28-Aug-18	1413	1423	1414
29-Aug-18	1413	1525	1412
30-Aug-18	1413		
31-Aug-18	1413		
1-Sep-18	1413	1387	1412
3-Sep-18	1413	1384	1414
4-Sep-18	1413	1063	1415
5-Sep-18	1413	1518	1416
6-Sep-18	1413		

7-Sep-18				1413	1475	1413
8-Sep-18				1413	1470	1412
9-Sep-18				1413		
10-Sep-18				1413	1367	1411
11-Sep-18				1413	1411	1413
12-Sep-18				1413	1301	1415
13-Sep-18				1413	1521	1409
14-Sep-18				1413	1391	1414
15-Sep-18				1413		
16-Sep-18				1413	1552	1412
17-Sep-18				1413	1233	1414
18-Sep-18				1413	1578	1410
19-Sep-18				1413	1420	1411
20-Sep-18				1413	1402	1411
21-Sep-18				1413	1443	1415
22-Sep-18				1413	1417	1409
23-Sep-18				1413	1385	1415
24-Sep-18				1413	1417	1410
25-Sep-18				1413	1431	1411
26-Sep-18				1413	1462	1417
27-Sep-18				1413	1413	1431
29-Sep-18				1413	1414	1413
1-Oct-18				1413	1248	1422
4-Oct-18				1413	1418	1422
5-Oct-18				1413	1379	1415
6-Oct-18	4.00 7.00 10.00	4.24 7.88	3.98 7.01 10.19	1413	1433	1413
7-Oct-18	4.00 7.00 10.00	3.86 8.14 9.63	3.98 6.99 10.05	1413	1645	1412
8-Oct-18	4.00 7.00 10.00	4.18 8.18 9.71	3.98 7.01 10.17	1413	1422	1413
9-Oct-18	4.00 7.00 10.00	3.98 6.85 9.92	3.95 7 10.04	1413	1317	1413
10-Oct-18	4.00 7.00 10.00	4.00 7.01 10.30	3.98 7 10.1	1413	1415	1412

11-Oct-18	4.00 7.00 10.00	4.05 7.03 10.25	4.01 6.99 10.17	1413	1416	1414
12-Oct-18	4.00 7.00 10.00	4.01 6.98 10.60	4 9.97 10.12	1413	1398	1413
13-Oct-18	4.00 7.00 10.00	4.00 6.95 10.05	4 6.99 10.08	1413	1477	1411
14-Oct-18	4.00 7.00 10.00	4.04 6.99 10.08	4.01 6.98 10.15	1413	1420	1413
15-Oct-18	4.00 7.00 10.00	4.02 6.96 10.08	4.02 7.02 10.15	1413	1396	1414
16-Oct-18				1413	1546	1411
17-Oct-18				1413	1248	1412
18-Oct-18				1413	1415	1414
19-Oct-18				1413	1415	1411
20-Oct-18				1413	1452	1440
21-Oct-18				1413	1488	1433
22-Oct-18				1413	1388	1407
23-Oct-18				1413	1463	1453
24-Oct-18				1413	1446	1413
25-Oct-18				1413	1432	1407
26-Oct-18				1413	1416	1413
27-Oct-18				1413	1396	1415
28-Oct-18				1413	1397	1413
29-Oct-18				1413	1410	1413
30-Oct-18				1413	1399	1413
31-Oct-18				1413	1418	1414
1-Nov-18				1413	1417	1410
2-Nov-18				1413	1401	1412

2-Nov-18			
3-Nov-18	1413	1398	1413
4-Nov-18	1413	1435	1412
5-Nov-18	1413	1364	1412
6-Nov-18	1413	1394	1412
7-Nov-18	1413	1409	1414
8-Nov-18	1413	1413	1413
9-Nov-18	1413	1412	1413
10-Nov-18	1413	1411	1412
11-Nov-18	1413	1398	1412
12-Nov-18	1413	1426	1412
13-Nov-18	1413	1420	1413
14-Nov-18	1413	1397	1412
15-Nov-18	1413	1487	1413
16-Nov-18	1413	1329	1413
17-Nov-18	1413	1418	1413
18-Nov-18	1413	1418	1413
19-Nov-18	1413	1411	1413
20-Nov-18	1413	1413	1413
21-Nov-18	1413	1405	1413
22-Nov-18	1413	1409	1416
23-Nov-18	1413	1090	1413
24-Nov-18	1413	1585	1413
25-Nov-18	1413	1392	1413
26-Nov-18	1413	1433	1413
27-Nov-18	1413	1404	1413
28-Nov-18	1413	1407	1414
29-Nov-18	1413	1405	1414
30-Nov-18	1413	1412	1414
4-Dec-18	1413	1420	1415
5-Dec-18	1413	1425	1415
6-Dec-18	1413	1414	1412
7-Dec-18	1413	1409	1412

8-Dec-18	1413	1406	1412
9-Dec-18	1413	1399	1414
11-Dec-18	1413	1415	1412
13-Dec-18	1413	1426	1413
14-Dec-18	1413	1421	1411
15-Dec-18	1413	1438	1412
16-Dec-18	1413	1417	1413
17-Dec-18	1413	1422	1413
18-Dec-18	1413	1436	1413
19-Dec-18	1413	1419	1415
20-Dec-18	1413	1422	1414
21-Dec-18	1413	1401	1418
22-Dec-18	1413	1431	1412
23-Dec-18	1413	1417	1413
24-Dec-18	1413	1425	1414
25-Dec-18	1413	1402	1413
26-Dec-18	1413	1404	1414
27-Dec-18	1413	1410	1412
28-Dec-18	1413	1419	1414
29-Dec-18	1413	1432	1414
30-Dec-18	1413	1420	1415
31-Dec-18	1413	1402	1415

Table 8.90 : Meadowbank 2018 Hoskin calibration datasheets

Meadowbank 2018 Hoskin calibration datasheets					
Date yyyy/mm/dd	Standard	Initial reading	Final reading	Slope	Standard
19-Feb-18	4.00	4.00	4.00	-58.40	1413.0
	7.00	7.06	6.99		
20-Feb-18	4.00	4.00	4.00	-61.10	1413.0
	7.00	7.02	6.89		
21-Feb-18	4.00	4.03	4.00	-61.10	1413.0
	7.00	7.03	7.00		
22-Feb-18	4.00	4.03	4.00	61.10	1413.0
	7.00	6.92	6.90		
23-Feb-18	4.00	3.99	4.00	61.10	1413.0
	7.00	6.88	6.89		
25-Feb-18	4.00	4.01	3.99	61 / -14	1413.0
	7.00	6.89	6.90		
26-Feb-18	4.00	4.01	4.01	58,4 / -6	1413.0
	7.00	7.00	7.01		
27-Feb-18	4.00	4.00	3.97	57,6 / -6	
	7.00	6.98	6.99		
28-Feb-18	4.00	4.01	3.99	57.9/-7	
	7.00	7.04	6.98		
1-Mar-18	4.00	4.02	4.03	58.8 / -9	
	7.00	6.98	7.01		
2-Mar-18	4.00	4.01	4.02	57.8 / -7	
	7.00	6.99	7.00		
3-Mar-18	4.00	4.00	4.01	57.9/ -7	
	7.00	7.01	7.02		
4-Mar-18	4.00	4.02	4.02	58/-9	
	7.00	6.98	7.02		
5-Mar-18	4.00	4.00	3.99	57.7/-9	
	7.00	7.01	7.00		
6-Mar-18	4.00	4.02	3.99	57.5/-10	
	7.00	7.03	6.99		
7-Mar-18	4.00	4.02	3.98	58/-10	
	7.00	7.03	6.99		
8-Mar-18	4.00	4.01	4.00	58/-10	
	7.00	7.03	6.99		
10-Mar-18	4.00	4.01	3.97	57/-11	
	7.00	7.03	6.99		
11-Mar-18	4.00	4.01	4.00	57.3/-10	
	7.00	7.00	7.00		
13-Mar-18	4.00	4.03	4.00	57.5/-11	
	7.00	7.05	7.00		
15-Mar-18	4.00	4.01	4.00	57.8/-12	
	7.00	7.05	7.01		
16-Mar-18	4.00	3.97	4.01	57.5/-11	
	7.00	6.99	7.00		

17-Mar-18	4.00	3.98	4.01	57.9/-11	
	7.00	6.99	7.00		
19-Mar-18	4.00	4.05	4.02	57.1/-11	
	7.00	7.02	7.03		
21-Mar-18	4.00	3.98	3.98	57.1/-11	
	7.00	7.03	7.01		
22-Mar-18	4.00	3.95	3.99	57.5/-10	
	7.00	6.99	7.02		
23-Mar-18	4.00	4.01	4.00	57.5/11	
	7.00	7.04	7.02		
24-Mar-18	4.00	3.99	4.00	57.5/11	
	7.00	7.01	7.02		
25-Mar-18	4.00	4.01	4.00	57.5/12	
	7.00	7.02	7.00		
27-Mar-18	4.00	3.96	3.99	5.23	
	7.00	7.01	7.00		
	Blizzard between March 28 and 30th				
31-Mar-18	4.00	4.05	4.02	57.3/-10	
	7.00	7.06	7.02		
1-Apr-18	4.00	3.99	4.00	-58.10	-10.0
	7.00	7.00	7.10		
2-Apr-18	4.00	3.97	3.99		
	7.00	7.04	7.02	-58.10	11.0
3-Apr-18	4.00	3.99	4.01		
	7.00	7.00	7.01	-58.30	-12.0
4-Apr-18	4.00	3.99	4.04		
	7.00	7.03	7.01	-57.90	-13.0
6-Apr-18	4.00	4.01	4.02		
	7.00	6.99	7.02	-58.00	-12.0
7-Apr-18	4.00	4.28	4.00		
	7.00	7.23	7.00	-58.30	-14.0
8-Apr-18	4.00	4.01	4.00		
	7.00	7.02	7.01	-58.50	-14.0
9-Apr-18	4.00	4.04	3.99		
	7.00	7.00	7.01	-58.30	-14.0
12-Apr-18	4.00	3.95	3.98	-58.00	-14.0
	7.00	7.03	7.03		
13-Apr-18	4.00	4.01	4.02	57.90	-13.0
	7.00	7.03	7.02		
16-Apr-18	4.00	4.00	3.99	58.30	-13.0
	7.00	7.02	7.00		
17-Apr-18	4.00	4.03	4.01	-58.60	-13.0
	7.00	6.97	7.02		
18-Apr-18	4.00	4.06	4.02	-58.40	-13.0
	7.00	7.01	7.01		
19-Apr-18	4.00	4.02	4.01	-59.00	-14.0
	7.00	7.01	7.02		
20-Apr-18	4.00	4.04	4.04	-58.50	-14.0
	7.00	7.03	7.02		
21-Apr-18	4.00	4.03	4.02	-58.60	-15.0
	7.00	7.02	7.01		
22-Apr-18	4.00	4.01	3.99	-57.60	-14.0

	7.00	7.03	7.05		
23-Apr-18	4.00	3.99	4.03	-58.30	-14.0
	7.00	7.04	7.04		
25-Apr-18	4.00	4.00	4.00	-57.90	-16.0
	7.00	7.06	7.01		
26-Apr-18	4.00	4.02	4.01	-56.40	-15.0
	7.00	7.04	7.04		
28-Apr-18	4.00	4.01	4.00	-57.30	-15.0
	7.00	7.04	7.02		
29-Apr-18	4.00	4.02	3.99	-57.20	-15.0
	7.00	7.03	7.04		
30-Apr-18	4.00	4.03	4.01	-57.20	-15.0
	7.00	7.00	7.02		
1-May-18	4.00	4.02	4.02	-57.50	-16.0
	7.00	7.00	7.02		
3-May-18	4.00	4.02	4.02	-57.80	-17.0
	7.00	7.01	7.01		
4-May-18	4.00	4.02	4.01	-57.90	-17.0
	7.00	7.01	7.01		
5-May-18	4.00	4.04	3.99	-57.20	-17.0
	7.00	7.02	7.01		
6-May-18	4.00	3.97	3.99	-57.00	-16.0
	7.00	7.00	7.02		
7-May-18	4.00	3.99	3.98	-57.60	-19.0
	7.00	7.04	6.98		
8-May-18	4.00	4.00	4.00	-56.80	-15.0
	7.00	6.95	7.04		
9-May-18	4.00	3.97	3.99	-56.90	-15.0
	7.00	7.01	7.03		
10-May-18	4.00	4.01	4.01	-57.40	-15.0
	7.00	7.02	6.99		
11-May-18	4.00	4.01	3.99	-56.00	-15.0
	7.00	7.02	7.03		
12-May-18	4.00	3.98	3.99	-56.60	-15.0
	7.00	7.02	7.02		
13-May-18	4.00	3.99	3.99	-56.90	-15.0
	7.00	7.03	6.99		
14-May-18	4.00	4.01	4.00	-56.70	-15.0
	7.00	7.04	7.02		
15-May-18	4.00	3.98	4.00	-57.00	-15.0
	7.00	7.01	7.00		
16-May-18	4.00	4.04	3.99	-56.20	-16.0
	7.00	7.03	7.02		
	1413	1454	1425	0.464	
	4.00	3.99	4.00	-57.10	-16.0
17-May-18	7.00	7.03	6.99		
	1413	1421	1423	0.465	
	4.00	3.97	3.98	-56.10	-14.0
18-May-18	7.00	6.98	7.04		
	4.00	3.96	4.00	-55.80	-14.0
19-May-18	7.00	7.02	7.03		

	4.00	3.96	3.99	-56.30	-14.0
20-May-18	7.00	7.02	7.01		
	4.00	3.98	3.99	-56.20	-14.0
21-May-18	7.00	6.99	7.01		
	4.00	3.98	4.00	-56.00	-13.0
22-May-18	7.00	7.00	7.03		
	4.00	3.95	4.00	-56.70	-14.0
23-May-18	7.00	7.01	7.02		
	4.00	4.01	4.00	-56.30	-15.0
24-May-18	7.00	7.04	7.02		
	4.00	3.97	3.99	-55.90	-14.0
25-May-18	7.00	6.99	7.04		
	4.00	3.99	4.00	-56.10	-14.0
26-May-18	7.00	7.02	7.03		
	4.00	3.99	4.00	-56.50	-15.0
27-May-18	7.00	7.04	7.00		
	4.00	3.98	4.00	-56.40	-12.0
28-May-18	7.00	6.96	7.02		
	4.00	4.03	4.00	-56.10	-14.0
29-May-18	7.00	7.02	7.01		
	4.00	3.99	4.00	-55.70	-13.0
30-May-18	7.00	6.98	7.03		
	4.00	3.97	4.00	-55.90	-14.0
31-May-18	7.00	7.04	7.01		
1-Jun-18	4.00	4.00	4.00	-55.80	-15.0
	7.00	7.04	7.03		
2-Jun-18	4.00	3.96	3.99	-55.90	-16.0
	7.00	7.03	7.01		
3-Jun-18	4.00	4.01	3.99	-56.40	-16.0
	7.00	7.02	7.03		
4-Jun-18	4.00	3.98	4.00	-56.10	-16.0
	7.00	7.01	7.03		
5-Jun-18	4.00	4.03	3.97	-56.10	-16.0
	7.00	7.02	7.02		
6-Jun-18	4.00	3.99	4.00	-55.70	-16.0
	7.00	7.00	7.01		
7-Jun-18	4.00	3.99	4.00	-55.70	-16.0
	7.00	7.00	7.01		
8-Jun-18	4.00	3.98	4.00	-56.20	-17.0

	7.00	7.20	7.00		
9-Jun-18	4.00	4.02	3.96	-55.10	-15.0
	7.00	7.00	6.98		
10-Jun-18	4.00	4.01	4.00	-55.20	-16.0
	7.00	7.05	7.02		
11-Jun-18	4.00	3.98	3.99	-54.90	-15.0
	7.00	7.00	7.02		
12-Jun-18	4.00	3.99	4.00	-55.30	-16.0
	7.00	7.03	7.01		
13-Jun-18	4.00	3.79	3.99	-58.00	-12.0
	7.00	6.85	7.05		
14-Jun-18	4.00	4.00	3.99	-58.80	-16.0
	7.00	7.05	7.01		
15-Jun-18	4.00	3.95	3.99	-57.60	-14.0
	7.00	6.96	7.00		
16-Jun-18	4.00	3.93	4.00	-58.30	-13.0
	7.00	6.99	7.01		
17-Jun-18	4.00	3.98	3.99	-57.80	-12.0
	7.00	7.01	7.05		
18-Jun-18	4.00	3.99	4.00	-58.20	-12.0
	7.00	7.03	7.02		
19-Jun-18	4.00	4.01	4.00	-58.20	-12.0
	7.00	7.01	7.02		
20-Jun-18	4.00	3.99	4.00	-58.30	-12.0
	7.00	7.02	7.01		
21-Jun-18	4.00	3.98	4.00	-57.80	-12.0
	7.00	7.01	7.03		
22-Jun-18	4.00	4.01	4.03	-58.40	-12.0
	7.00	7.02	7.02		
23-Jun-18	4.00	4.11	4.00	-58.20	-15.0
	7.00	7.06	7.00		
24-Jun-18	4.00	4.05	4.00	-58.00	-17.0
	7.00	7.04	7.01		
25-Jun-18	4.00	4.03	4.00	-58.20	-18.0
	7.00	7.03	7.00		
26-Jun-18	4.00	3.99	4.00	-57.90	-16.0
	7.00	7.00	7.01		
27-Jun-18	4.00	4.04	4.00	-57.60	-17.0
	7.00	7.01	7.00		
28-Jun-18	4.00	4.05	3.99	-57.90	-18.0
	7.00	7.04	7.00		
29-Jun-18	4.00	3.99	3.99	-57.50	-16.0
	7.00	6.98	7.00		
30-Jun-18	4.00	3.98	4.00	-57.50	-16.0
	7.00	6.99	7.02		
1-Jul-18	4.00	3.98	4.01	-57.90	-15.0
	7.00	6.97	6.98		
2-Jul-18	4.00	3.98	4.00	-57.30	-15.0
	7.00	6.99	7.01		
3-Jul-18	4.00	3.99	4.00	-57.10	-15.0
	7.00	7.00	6.99		
4-Jul-18	4.00	3.99	4.01	-57.20	-13.0

	7.00	7.02	6.98		
5-Jul-18	4.00	4.03	4.00	-56.80	-14.0
	7.00	7.00	6.98		
6-Jul-18	4.00	4.05	3.99	-57.00	-17.0
	7.00	7.05	7.00		
7-Jul-18	4.00	3.98	3.99	-56.70	-15.0
	7.00	6.97	6.98		
8-Jul-18	4.00	3.99	3.99	-56.70	-17.0
	7.00	7.03	7.03		
9-Jul-18	4.00	3.97	3.99	-56.40	-15.0
	7.00	6.98	7.04		
10-Jul-18	4.00	3.95	3.99	-56.50	-16.0
	7.00	7.00	6.99		
11-Jul-18	4.00	3.98	3.98	-56.80	-16.0
	7.00	7.00	6.97		
12-Jul-18	4.00	4.01	4.00	-56.20	-17.0
	7.00	7.01	7.01		
13-Jul-18	4.00	4.08	4.00	-56.60	-19.0
	7.00	7.00	6.98		
14-Jul-18	4.00	3.97	3.99	-56.00	-19.0
	7.00	6.97	6.99		
15-Jul-18	4.00	4.03	3.99	-56.20	-20.0
	7.00	7.02	7.01		
16-Jul-18	4.00	3.98	4.00	-56.30	-18.0
	7.00	6.97	7.00		
17-Jul-18	4.00	4.02	4.01	-56.50	-18.0
	7.00	7.00	7.00		
18-Jul-18	4.00	4.02	4.00	-56.30	-18.0
	7.00	7.00	7.01		
19-Jul-18	4.00	4.04	4.00	-56.30	-19.0
	7.00	7.02	7.01		
20-Jul-18	4.00	4.05	4.00	-56.30	-21.0
	7.00	7.03	7.00		
21-Jul-18	4.00	3.96	4.00	-55.90	-18.0
	7.00	6.95	7.00		
22-Jul-18	4.00	4.06	4.00	-56.30	-21.0
	7.00	7.05	7.00		
23-Jul-18	4.00	4.04	4.00	-56.00	-21.0
	7.00	7.01	7.00		
24-Jul-18	4.00	4.03	4.00	-55.70	-20.0
	7.00	6.98	7.00		
25-Jul-18	4.00	4.01	4.01	-56.00	-21.0
	7.00	7.02	7.02		
26-Jul-18	4.00	4.02	4.00	-55.80	-21.0
	7.00	7.00	7.03		
27-Jul-18	4.01	3.96	4.01	-59.20	-19.0
	7.00	6.97	7.00		
28-Jul-18	4.01	-	3.99	-55.80	-20.0
	7.00	6.98	6.99		
29-Jul-18	4.01	3.88	4.00	-58.30	-21.0
	7.00	6.95	7.01		
30-Jul-18	4.01	4.01	4.02	-57.50	-20.0

	7.00	7.01	6.99		
31-Jul-18	4.01	3.97	3.99	-57.50	-20.0
	7.00	6.99	7.01		
1-Aug-18	4.01	3.99	4.00	-57.70	-20.0
	7.00	6.97	6.99		
2-Aug-18	4.01	3.99	4.01	-57.40	-20.0
	7.00	6.99	7.00		
4-Aug-18	4.01	3.96	3.97	-56.70	-19.0
	7.00	7.00	7.01		
5-Aug-18	4.01	3.92	3.99	-57.80	-19.0
	7.00	6.99	6.98		
6-Aug-18	4.01	4.00	4.00	-57.50	-20.0
	7.00	7.02	7.03		
7-Aug-18	4.01	3.98	4.00	-57.50	-20.0
	7.00	7.00	6.98		
8-Aug-18	4.01	4.00	4.00	-57.50	-19.0
	7.00	7.00	6.99		
9-Aug-18	4.01	4.00	3.99	-57.30	-19.0
	7.00	7.00	7.01		
10-Aug-18	4.01	3.96	4.00	-57.20	-18.0
	7.00	6.97	6.99		
11-Aug-18	4.01	4.01	4.00	-57.80	-19.0
	7.00	7.01	7.00		
12-Aug-18	4.01	3.96	3.96	-58.10	-20.0
	7.00	7.03	7.02		
13-Aug-18	4.01	4.02	4.00	-56.90	-18.0
	7.00	6.96	7.02		
14-Aug-18	4.01	4.01	3.99	-57.30	-18.0
	7.00	7.00	6.92		
15-Aug-18	4.01		4.02	-57.10	-16.0
	7.00		7.02		
16-Aug-18	4.01	3.99	3.99	-56.40	-17.0
	7.00	7.01	7.01		
17-Aug-18	4.01	4.03	4.00	-56.80	-19.0
	7.00	7.02	7.02		
18-Aug-18	4.01	3.99	4.00	-56.70	-18.0
	7.00	7.00	7.01		
19-Aug-18	4.01	4.08	4.00	-56.60	-20.0
	7.00	7.05	7.00		
20-Aug-18	4.01	4.03	4.00	-56.70	-20.0
	7.00	7.03	7.01		
21-Aug-18	4.01	4.01	3.99	-56.90	-20.0
	7.00	7.02	7.02		
22-Aug-18	4.01	4.02	3.99	-56.80	-20.00
	7.00	7.02	7.01		
23-Aug-18	4.01	3.99	3.99	-56.70	-19.00
	7.00	6.99	7.02		
24-Aug-18	4.01	4.03	4.00	-56.10	-19.00
	7.00	6.99	7.03		
25-Aug-18	4.01	4.01	4.03	-57.30	-19.00
	7.00	7.03	7.03		
26-Aug-18	4.01	4.03	4.00	-56.20	-18.00

	7.00	6.99	7.01		
27-Aug-18	4.01	3.97	4.03	-56.60	-18.00
	7.00	6.99	7.01		
28-Aug-18	4.01	4.04	4.02	-55.50	-18.00
	7.00	7.01	7.03		
29-Aug-18	4.01	4.01	4.01	-54.90	-21.00
	7.00	6.98	7.03		
1-Sep-18	4.01	3.87	4.01	-57.90	-24.00
	7.00	7.05	7.03		
3-Sep-18	4.00	3.94	4.03	-57.80	-22.0
	7.00	6.98	7.03		
4-Sep-18	4.00	3.98	4.00	-57.70	-23.0
	7.00	7.00	7.03		
5-Sep-18	4.00	4.01	4.00	-55.00	-20.00
	7.00	7.10	6.98		
7-Sep-18	4.00	4.01	3.99	-54.50	-20.0
	7.00	7.02	7.02		
8-Sep-18	4.00	4.02	4.02	-5.50	-23.0
	7.00	7.05	7.02		
10-Sep-18	4.00	4.01	4.02	-54.70	-18.0
	7.00	7.03	7.02		
11-Sep-18	4.00	4.03	4.01	-54.70	-24.0
	7.00	7.01	7.02		
12-Sep-18	4.00	4.02	3.99	-53.30	-20.0
	7.00	6.97	7.02		
13-Sep-18	4.00	3.98	4.00	-53.10	-20.0
	7.00	6.99	7.02		
14-Sep-18	4.00	4.02	3.99	-53.20	-20.0
	7.00	6.99	7.05		
16-Sep-18	4.00	3.99	4.04	-52.70	-18.0
	7.00	6.99	7.04		
17-Sep-18	4.00	4.03	4.00	-51.70	-18.0
	7.00	6.99	7.01		
18-Sep-18	4.00	4.04	4.01	-51.90	-18.0
	7.00	6.96	7.03		
19-Sep-18	4.00	4.01	4.01	-52.20	-18.0
	7.00	6.88	7.03		
20-Sep-18	4.00	4.02	4.02	-52.10	-17.0
	7.00	7.00	7.02		
21-Sep-18	4.00	4.09	3.99	-51.60	-22.0
	7.00	7.07	7.02		
22-Sep-18	4.00	4.01	3.97	-50.30	-20.0
	7.00	6.98	6.99		
23-Sep-18	4.00	3.97	4.00	-51.60	-20.0
	7.00	6.99	6.99		
24-Sep-18	4.00	4.01	3.98	-50.00	-19.0
	7.00	6.99	6.99		
25-Sep-18	4.00	4.01	3.98	-51.00	-20.0
	7.00	6.99	6.98		
26-Sep-18	4.00	4.01	4.04	-52.20	-19.0
	7.00	7.00	7.04		
27-Sep-18	4.00	4.01	4.01	-51.40	-20.0

	7.00	7.00	7.04		
28-Sep-18	4.00	4.01	4.00	na	na
	7.00	6.85	6.88		
29-Sep-18	4.00	3.99	3.99	-53.90	-27.0
	7.00	6.89	6.87		
1-Oct-18	4.00	4.01	4.00	-52.20	-26.0
	7.00	6.88	6.89		
2-Oct-18	4.00	4.01	4.01	-54.30	-30.0
	7.00	6.87	6.91		
3-Oct-18	4.00	4.01	4.06	-53.90	-29.0
	7.00	6.87	6.91		
4-Oct-18	4.00	3.64	4.00	-60.30	-30.0
	7.00	6.90	6.88		
17-Oct-18	4.00		4.02	-57.60	-24.0
	7.00		7.02		
18-Oct-18	4.00	4.01	3.97	-57.00	-27.0
	7.00	7.02	7.00		
19-Oct-18	4.00	3.93	3.98	-56.90	-29.0
	7.00	6.96	7.01		
20-Oct-18	4.00	4.01	3.98	-57.00	-26.0
	7.00	7.06	7.01		
21-Oct-18	4.00	3.93	4.00	-56.90	-28.0
	7.00	6.97	7.03		
22-Oct-18	4.00	4.03	4.02	-57.10	-25.0
	7.00	7.06	7.04		
23-Oct-18	4.00	4.02	4.02	-57.10	-25.0
	7.00	7.06	7.04		
24-Oct-18	4.00	4.02	4.02	-57.60	-27.0
	7.00	7.08	7.03		
25-Oct-18	4.00	3.99	4.01	-57.90	-25.0
	7.00	7.01	7.03		
26-Oct-18	4.00	4.04	4.02	-56.50	-25.0
	7.00	7.03	6.99		
27-Oct-18	4.00	3.97	4.01	-57.60	-25.0
	7.00	7.01	7.01		
28-Oct-18	4.00	4.03	4.02	-57.50	-26.0
	7.00	7.05	7.02		
29-Oct-18	4.00	4.03	3.97	-57.40	-27.0
	7.00	7.05	6.99		
30-Oct-18	4.00	3.98	4.00	-57.00	-26.0
	7.00	7	7.02		
31-Oct-18	4.00	4.01	4.02	-56.60	-26.0
	7.00	7	7.03		
1-Nov-18	4.00	4.02	4.02	-56.40	-28.0
	7.00	7.02	7.03		
2-Nov-18	4.00	4.01	4.03	-56.80	-27.0
	7.00	7.02	7.03		
3-Nov-18	4.00	4.00	4.02	-56.70	-26.0
	7.00	6.99	7.02		
4-Nov-18	4.00	4.03	4.02	-56.60	-28.0
	7.00	7.07	7.02		
5-Nov-18	4.00	4.02	4.02	-56.20	-29.0

	7.00	7.00	7.03		
6-Nov-18	4.00	4.00	4.01	-56.10	-28.0
	7.00	6.99	7.02		
7-Nov-18	4.00	3.99	4.02	-55.30	-27.0
	7.00	7.01	7.03		
8-Nov-18	4.00	4.04	3.98	-55.20	-28.0
	7.00	6.99	7.03		
9-Nov-18	4.00	4.03	4.02	-55.20	-28.0
	7.00	7.01	7.03		
10-Nov-18	4.00	4.02	4.01	-54.80	-27.0
	7.00	7.03	7.04		
11-Nov-18	4.00	4.04	3.99	-54.30	-29.0
	7.00	7.04	7.03		
12-Nov-18	4.00	3.96	4.02	-54.20	-27.0
	7.00	6.97	7.02		
13-Nov-18	4.00	3.99	4.02	-54.40	-28.0
	7.00	6.94	7.00		
14-Nov-18	4.00	**E3**	4.05	-58.60	-26.0
	7.00	**E3**	7.05		
14-Nov-18	4.00	4.05	4.03	-58.50	-27.0
	7.00	7.05	7.04		
15-Nov-18	4.00	4.05	4.00	-57.00	-28.0
	7.00	7.06	7.06		
16-Nov-18	4.00	3.96	4.02	-57.90	-27.0
	7.00	7.04	7.03		
17-Nov-18	4.00	4.03	4.01	-58.00	-28.0
	7.00	7.05	7.03		
18-Nov-18	4.00	3.99	3.99	-57.30	-26.0
	7.00	6.99	7.03		
19-Nov-18	4.00	3.99	3.99	-57.30	-27.0
	7.00	7.03	7.02		
20-Nov-18	4.00	3.98	4.01	-57.30	-27.0
	7.00	7.40	7.01		
21-Nov-18	4.00	4.03	4.00	-57.80	-26.0
	7.00	7.03	7.04		
22-Nov-18	4.00	4.00	4.01	-57.70	-27.0
	7.00	7.05	7.04		
23-Nov-18	4.00	4.00	4.01	-57.80	-27.0
	7.00	7.03	7.04		
24-Nov-18	4.00	4.07	4.01	-57.80	-27.0
	7.00	7.07	7.04		
2018-11-25	4.00	4.01	4.01	-57.90	-27.0
	7.00	7.02	7.03		
2018-11-26	4.00	4.03	4.01	-57.60	-29.0
	7.00	7.04	7.02		
2018-11-27	4.00	3.98	4.02	-57.60	-27.0
	7.00	7.02	7.00		
2018-11-28	4.00	7.03	4.00	-57.70	-28.0
	7.00	7.06	7.03		
2018-11-29	4.00	3.99	4.01	-57.60	-28.0
	7.00	6.99	7.03		
2018-11-30	4.00	4.01	4.02	-57.70	-27.0

2018-11-30	7.00	7.04	7.03		
2018-12-04	4.00	4.04	4.02	-57.50	-28.0
	7.00	7.07	7.04		
2018-12-05	4.00	4.04	4.01	-56.60	-29.0
	7.00	7.04	7.04		
2018-12-06	4.00	4.00	4.01	-56.60	-28.0
	7.00	7.04	7.06		
2018-12-07	4.01	4.02	3.99	-56.50	-29.0
	7.00	7.05	7.04		
2018-12-08	4.01	4.01	3.98	-57.00	-30.0
	7.00	7.03	7.01		
2018-12-09	4.00	3.99	4.00	-56.60	-29.0
	7.00	7.02	7.03		
2018-12-10	4.00	3.99	4.00	-57.00	-30.0
	7.00	7.04	7.02		
2018-12-11	4.00	4.01	4.00	-56.80	-30.0
	7.00	7.00	7.01		
2018-12-12	4.00	-	4.01	-58.40	-11.0
	7.00	-	7.03		
2018-12-13	4.00	4.01	4.01	-58.60	-12.0
	7.00	7.04	7.03		
2018-12-14	4.00	4.01	4.02	-58.80	-12.0
	7.00	7.01	7.03		
2018-12-15	4.00	4.03	3.99	-58.80	-13.0
	7.00	7.03	7.02		
2018-12-16	4.00	4.03	3.99	-58.80	-14.0
	7.00	7.04	7.01		
2018-12-17	4.00	4.02	4.02	-58.50	-13.0
	7.00	7.03	7.04		
2018-12-18	4.00	4.01	4.01	-59.10	-15.0
	7.00	7.04	7.02		
2018-12-19	4.00	4.07	4.07	-58.60	-17.0
	7.00	7.06	7.02		
2018-12-20	4.00	3.98	4.01	-58.50	-14.0
	7.00	6.99	7.03		
2018-12-21	4.00	4.01	4.00	-58.40	-16.0
	7.00	7.04	7.00		
2018-12-22	4.00	3.99	4.01	-58.90	-15.0
	7.00	7.00	7.02		
2018-12-23	4.00	4.01	4.00	-58.50	-16.0
	7.00	7.03	6.99		
2018-12-24	4.00	3.99	4.01	-58.70	-15.0
	7.00	7.01	7.02		
2018-12-25	4.00	4.02	4.01	-58.60	-15.0
	7.00	7.02	7.02		
2018-12-26	4.00	4.01	4.01	-58.60	-15.0
	7.00	7.04	7.03		
2018-12-27	4.00	4.01	4.01	-58.30	-14.0
	7.00	7.02	7.03		
2018-12-28	4.00	4.02	4.01	-57.40	14.0
	7.00	7.04	7.04		
2018-12-29	4.00	3.96	4.02	-58.20	14.0

2018-12-29	7.00	7.01	7.04		
2018-12-30	4.00	3.98	4.01	-58.60	-16.0
	7.00	7.02	7.02		
2018-12-31	4.00	4.03	4.00	-58.50	-18.0
	7.00	7.07	7.01		

Table 8.91: Meadowbank 2018 Eureka mantra+ 20 calibration datasheets

Meadowbank 2018 Eureka mantra+ 20 calibration datasheets*									
Date	**Time**	**Sensor**	**SN**	**Units**	**RV**	**Old**	**New**	**SRF**	**Status**
1/15/2018	9:06:39	COND	12162589	uS/cm	3.01E+02	1432	1413	114	Done
1/15/2018	9:08:59	PH	12162589	pH	1.59E-01	3.83	4	90	
1/15/2018	9:10:34	PH	12162589	pH	-1.74E-01	9.87	10	101	
1/15/2018	9:11:41	PH	12162589	pH	-1.08E-02	6.91	7	93/96/89	Done
1/15/2018	9:19:17	HDO	12162589	%SAT	9.68E+01	98.6	100	100	Done
1/17/2018	7:24:43	COND	12162589	uS/cm	3.02E+02	1400	1413	113	Done
1/17/2018	7:54:04	PH	12162589	pH	1.61E-01	3.96	4	91	
1/17/2018	7:55:30	PH	12162589	pH	-1.73E-01	9.98	10	102	
1/17/2018	7:57:01	PH	12162589	pH	-8.67E-03	6.96	7	95/96/91	Done
1/17/2018	8:21:29	HDO	12162589	%SAT	1.05E+02	107	100	100	Done
1/22/2018	8:55:14	PH	12162589	pH	1.55E-01	4.1	4	87	
1/22/2018	8:57:02	PH	12162589	pH	-1.72E-01	9.98	10	102	
1/22/2018	8:58:38	PH	12162589	pH	-9.82E-03	7.02	7	94/94/90	Done
1/22/2018	9:00:53	COND	12162589	uS/cm	3.12E+02	1407	1413	112	Done
1/22/2018	9:04:41	HDO	12162589	%SAT	9.76E+01	99.4	100	100	Done
1/23/2018	18:01:10	HDO	12162589	%SAT	9.69E+01	98.6	100	100	Done
2/5/2018	9:10:20	PH	12162589	pH	1.56E-01	4	4	88	
2/5/2018	9:11:07	PH	12162589	pH	-1.05E-02	7.01	7	94/95/89	Done
2/5/2018	9:13:08	COND	12162589	uS/cm	2.78E+02	1478	1413	118	Done
2/5/2018	9:17:32	HDO	12162589	%SAT	9.08E+01	92.5	100	100	Done
2/7/2018	11:21:40	HDO	12162589	%SAT	1.01E+02	103.2	100	100	Done
2/12/2018	12:36:05	PH	12162589	pH	1.51E-01	4.08	4	85	
2/12/2018	12:36:59	PH	12162589	pH	-1.43E-02	7.06	7	92	
2/12/2018	12:38:03	PH	12162589	pH	-1.72E-01	9.91	10	102/92/85	Done
2/12/2018	12:39:35	COND	12162589	uS/cm	2.83E+02	1414	1413	118	Done
2/12/2018	12:43:32	HDO	12162589	%SAT	9.63E+01	98.1	100	100	Done
2/19/2018	12:58:33	PH	12162589	pH	1.52E-01	3.96	4	86	
2/19/2018	13:02:25	PH	12162589	pH	-1.69E-01	9.96	10	104	
2/19/2018	13:03:43	PH	12162589	pH	-1.37E-02	6.98	7	92/92/86	Done
2/19/2018	13:06:33	COND	12162589	uS/cm	3.27E+02	1279	1413	106	Done
3/5/2018	9:52:40	HDO	12162589	%SAT	1.03E+02	105.3	100	100	Done
3/12/2018	9:56:21	COND	12162589	uS/cm	2.92E+02	1548	1413	117	Done
3/12/2018	9:59:21	PH	12162589	pH	1.50E-01	4.04	4.01	85	
3/12/2018	10:02:07	PH	12162589	pH	-1.68E-01	9.95	10	105	
3/12/2018	10:05:59	PH	12162589	pH	-9.45E-03	6.92	7	94/91/90	Done
3/25/2018	7:36:02	PH	12162589	pH	1.60E-01	3.83	4.01	90	
3/25/2018	7:36:43	PH	12162589	pH	-1.60E-02	7.12	7	91	Quit
3/25/2018	7:38:09	PH	12162589	pH	1.57E-01	3.88	4.01	89	
3/25/2018	7:39:04	PH	12162589	pH	-1.57E-02	7.11	7	91	
3/25/2018	7:40:13	PH	12162589	pH	-1.82E-01	10.26	10.01	97/97/84	Done
3/25/2018	7:46:14	COND	12162589	uS/cm	2.77E+02	1431	1413	118	Done
3/25/2018	7:54:28	HDO	12162589	%SAT	9.36E+01	95.3	100	100	Quit
3/25/2018	8:00:15	HDO	12162589	%SAT	9.90E+01	100.8	100	100	Done
3/31/2018	6:26:06	PH	12162589	pH	-1.82E-01	10.04	10	97	
3/31/2018	6:26:58	PH	12162589	pH	-1.42E-02	6.97	7	92/97/85	Done
3/31/2018	6:28:59	COND	12162589	uS/cm	2.95E+02	1411	1413	118	Done
3/31/2018	6:34:01	HDO	12162589	%SAT	9.88E+01	100.6	100	100	Done
4/1/2018	9:04:27	COND	12162589	uS/cm	2.66E+02	1412	1413	118	Done
4/1/2018	9:05:59	PH	12162589	pH	1.61E-01	3.92	4	91	
4/1/2018	9:06:36	PH	12162589	pH	-1.27E-02	6.97	7	92	
4/1/2018	9:07:39	PH	12162589	pH	-1.84E-01	9.97	10	96/98/87	Done
4/1/2018	9:12:53	HDO	12162589	%SAT	9.86E+01	100.4	100	100	Done
4/2/2018	8:30:30	COND	12162589	uS/cm	2.89E+02	1412	1413	118	Done
4/2/2018	8:31:29	PH	12162589	pH	1.57E-01	4.01	4	89	
4/2/2018	8:32:19	PH	12162589	pH	-1.83E-01	10.03	10	96	
4/2/2018	8:33:14	PH	12162589	pH	-1.39E-02	7.02	7	92/98/86	Done
4/2/2018	8:39:04	HDO	12162589	%SAT	1.01E+02	102.5	100	100	Done
4/2/2018	8:58:09	HDO	12162589	%SAT	1.01E+02	102.9	100	100	Done
5/5/2018	12:36:58	HDO	12162589	%SAT	9.45E+01	96.2	100	100	Done
5/5/2018	12:38:28	PH	12162589	pH	1.55E-01	4.06	4	87	
5/5/2018	12:39:11	PH	12162589	pH	-1.70E-02	7.05	7	90/98/82	Done
5/5/2018	12:40:32	COND	12162589	uS/cm	2.60E+02	1490	1413	125	Done
5/9/2018	9:02:44	PH	12162589	pH	1.60E-01	3.91	4.01	90	
5/9/2018	9:05:01	PH	12162589	pH	-1.34E-02	6.93	7.01	92	
5/9/2018	9:07:08	PH	12162589	pH	-1.82E-01	9.87	10.01	97/97/87	Done
5/9/2018	9:14:20	COND	12162589	uS/cm	2.85E+02	1274	1413	112	Done
5/9/2018	9:38:31	HDO	12162589	%SAT	9.64E+01	98.2	100	100	Done
5/13/2018	8:20:22	PH	12162589	pH	1.63E-01	3.96	4.01	92	
5/13/2018	8:22:14	PH	12162589	pH	-9.12E-03	6.93	7.01	95	
5/13/2018	8:23:46	PH	12162589	pH	-1.80E-01	9.94	10.01	98/97/91	Done
5/13/2018	8:34:01	COND	12162589	uS/cm	2.76E+02	1437	1413	114	Done
5/16/2018	6:31:27	PH	12162589	pH	-1.09E-02	7.04	7.01	94	
5/16/2018	6:35:04	PH	12162589	pH	1.62E-01	4.02	4.01	92	
5/16/2018	6:36:27	PH	12162589	pH	-1.73E-01	9.9	10.01	102/95/89	Done
5/16/2018	6:44:54	COND	12162589	uS/cm	2.79E+02	1406	1413	114	Done
5/16/2018	6:51:11	HDO	12162589	%SAT	1.01E+02	103.1	100	100	Done
5/18/2018	8:49:40	PH	12162589	pH	-1.23E-02	7.03	7	93	
5/18/2018	8:50:49	PH	12162589	pH	1.60E-01	4.03	4	90/98/87	Done
5/18/2018	8:56:11	COND	12162589	uS/cm	2.32E+02	1734	1413	140	Done
5/18/2018	8:59:20	HDO	12162589	mg/l	9.95E+01	9.36	100	100	Quit
5/18/2018	9:02:03	HDO	12162589	mg/l	9.99E+01	9.39	100	100	Quit
5/18/2018	9:09:25	HDO	12162589	mg/l	1.00E+02	9.31	100	100	Quit
5/20/2018	6:37:39	PH	12162589	pH	1.59E-01	4.01	4	89	
5/20/2018	6:38:22	PH	12162589	pH	1.59E-01	4.01	0	#DIV/0!	Done
5/20/2018	8:41:53	COND	12162589	uS/cm	5.07E+02	654.7	1413	64	Done
5/20/2018	8:45:07	PH	12162589	pH	-1.51E-02	2297	7	91	
5/20/2018	8:47:01	PH	12162589	pH	1.57E-01	19.28	4	89/99/84	Done
5/20/2018	8:54:55	HDO	12162589	mg/l	9.57E+01	9.12	100	100	Quit
5/20/2018	9:01:00	HDO	12162589	mg/l	9.59E+01	9.12	100	100	Quit
5/20/2018	9:14:23	HDO	12162589	mg/l	1.04E+02	9.49	100	100	Quit
5/21/2018	8:18:04	COND	12162589	uS/cm	2.65E+02	2640	1413	121	Done
5/21/2018	8:22:22	PH	12162589	pH	-1.70E-02	7.03	7	90	
5/21/2018	8:24:28	PH	12162589	pH	1.56E-01	4.02	4	88/99/82	Done
5/21/2018	8:37:12	HDO	12162589	%SAT	9.83E+01	100.1	100	100	Done
5/27/2018	6:54:34	COND	12162589	uS/cm	2.46E+02	1485	1413	127	Done
5/27/2018	6:58:19	PH	12162589	pH	1.54E-01	4.05	4.01	87	
5/27/2018	7:01:29	PH	12162589	pH	-1.92E-02	7.03	7	89	
5/27/2018	7:04:56	PH	12162589	pH	-1.91E-01	9.99	10	92/98/80	Done
5/27/2018	7:18:43	HDO	12162589	mg/l	9.27E+01	8.8	100	100	Quit

5/27/2018	7:27:59	HDO	12162589	%SAT	9.34E+01	95.1	100	100	Done
5/30/2018	12:04:06	PH	12162589	pH	-1.99E-02	7.01	7	88	
5/30/2018	12:13:58	PH	12162589	pH	1.54E-01	3.98	4	87/99/80	Done
5/30/2018	12:25:55	COND	12162589	uS/cm	2.73E+02	1323	1413	119	Done
6/2/2018	6:48:19	PH	12162589	pH	-2.27E-02	7.04	7	87	
6/2/2018	6:54:32	PH	12162589	pH	1.52E-01	4.05	4	85/99/77	Done
6/2/2018	6:58:26	COND	12162589	uS/cm	2.66E+02	1413	1413	119	Done
6/3/2018	7:04:25	PH	12162589	pH	-2.37E-02	7.01	7	86	
6/3/2018	7:09:38	PH	12162589	pH	1.50E-01	4.01	4	84/99/76	Done
6/3/2018	7:14:38	COND	12162589	uS/cm	2.77E+02	1417	1413	119	Done
7/2/2018	14:31:24	PH	12162589	pH	1.45E-01	4.08	4	82	
7/2/2018	14:39:27	PH	12162589	pH	-2.80E-02	7.07	7	84/98/72	Done
7/2/2018	15:04:58	COND	12162589	uS/cm	2.66E+02	1414	1413	120	Done
7/2/2018	16:08:23	HDO	12162589	%SAT	1.09E+02	110.6	100	100	Done
7/8/2018	10:00:06	COND	12162589	uS/cm	2.98E+02	1383	1413	117	Done
7/8/2018	10:02:50	PH	12162589	pH	1.42E-01	4	4	80	
7/8/2018	10:03:57	PH	12162589	pH	-2.90E-02	7.01	7	83	
7/8/2018	10:05:46	PH	12162589	pH	-1.81E-01	9.68	10	97/93/70	Done
7/8/2018	10:17:14	HDO	12162589	%SAT	9.16E+01	93.2	100	100	Done
7/15/2018	12:20:55	PH	12162589	pH	-1.84E-01	10	10	96	
7/15/2018	12:22:41	PH	12162589	pH	-3.18E-02	7.05	7	82	
7/15/2018	12:23:54	PH	12162589	pH	1.44E-01	4.03	4	81/93/68	Done
7/15/2018	12:25:46	COND	12162589	uS/cm	2.60E+02	1417	1413	117	Done
7/20/2018	6:54:22	PH	12162589	pH	1.37E-01	4.06	4	77	
7/20/2018	7:04:03	PH	12162589	pH	-3.34E-02	7.03	7	81/98/66	Done
7/20/2018	7:12:34	COND	12162589	uS/cm	2.80E+02	1458	1413	121	Done
7/29/2018	6:48:11	COND	12162589	uS/cm	2.79E+02	1340	1413	115	Done
7/29/2018	6:49:35	COND	12162589	uS/cm	2.74E+02	1396	1413	114	Done
7/29/2018	6:53:41	PH	12162589	pH	-2.06E-01	9.99	10	83	
7/29/2018	6:54:37	PH	12162589	pH	-3.56E-02	7.03	7	80/97/64	Done
7/29/2018	7:03:27	HDO	12162589	%SAT	9.70E+01	98.8	100	100	Done
8/6/2018	5:59:35	PH	12162589	pH	1.35E-01	3.97	4	76	
8/6/2018	6:01:57	PH	12162589	pH	-3.68E-02	7.01	7	79	
8/6/2018	6:04:05	PH	12162589	pH	-2.09E-01	10.06	10	82/98/63	Done
8/6/2018	6:10:42	COND	12162589	uS/cm	3.06E+02	1339	1413	108	Done
8/12/2018	9:05:13	PH	12162589	pH	1.33E-01	4.01	4	75	
8/12/2018	9:07:39	PH	12162589	pH	-3.85E-02	7.03	7	78	
8/12/2018	9:10:32	PH	12162589	pH	-2.11E-01	10.03	10	81/98/61	Done
8/12/2018	9:19:08	COND	12162589	uS/cm	2.86E+02	1531	1413	117	Done
8/12/2018	9:29:36	HDO	12162589	%SAT	1.03E+02	104.7	100	100	Done
8/17/2018	5:05:51	PH	12162589	pH	-3.69E-02	6.97	7	79	Quit
8/17/2018	5:07:04	PH	12162589	pH	-4.41E-02	7.09	7	75	Quit
8/17/2018	5:11:37	COND	12162589	uS/cm	2.76E+02	1439	1413	119	Done
9/2/2018	6:47:44	COND	12162589	uS/cm	2.93E+02	1392	1413	117	Done
9/2/2018	6:58:05	HDO	12162589	%SAT	8.74E+01	89	100	100	Done
9/2/2018	7:06:56	PH	12162589	pH	1.20E-01	4.22	4	68	
9/2/2018	7:08:53	PH	12162589	pH	-5.04E-02	7.2	7	71/98/49	Done
9/3/2018	10:22:23	COND	12162589	uS/cm	2.73E+02	1495	1413	124	Done
9/3/2018	10:30:53	HDO	12162589	%SAT	1.06E+02	107.5	100	100	Done
9/3/2018	10:35:57	PH	12162589	pH	-5.10E-02	7	7	71	
9/3/2018	10:38:09	PH	12162589	pH	1.18E-01	4.03	4	67/97/49	Done
9/8/2018	6:13:02	PH	12162589	pH	1.10E-01	4.11	4	62	
9/8/2018	6:13:50	PH	12162589	pH	-5.63E-02	7.09	7	68/96/43	Done
9/8/2018	6:15:14	COND	12162589	uS/cm	3.36E+02	1234	1413	108	Done
9/8/2018	6:19:00	HDO	12162589	%SAT	9.91E+01	101	100	100	Done
9/10/2018	10:14:44	PH	12162589	pH	1.17E-01	3.9	4	66	
9/10/2018	10:15:42	PH	12162589	pH	-4.96E-02	6.87	7	72/96/50	Done
9/10/2018	10:18:24	COND	12162589	uS/cm	3.06E+02	1454	1413	112	Done
9/11/2018	10:15:23	PH	12162589	pH	-5.35E-02	7.06	7.01	70	
9/11/2018	10:18:17	PH	12162589	pH	1.21E-01	3.97	4.01	69/99/47	Done
9/11/2018	10:21:33	COND	12162589	uS/cm	2.68E+02	1441	1413	114	Done
9/11/2018	10:26:18	HDO	12162589	%SAT	9.77E+01	99.5	100	100	Done
9/23/2018	7:06:24	PH	12162589	pH	1.12E-01	4.12	4	63	
9/23/2018	7:08:44	PH	12162589	pH	-5.64E-02	7.06	7	68/97/43	Done
9/23/2018	7:10:53	PH	12162589	pH	-5.67E-02	7	7	68	
9/23/2018	7:12:57	PH	12162589	pH	1.15E-01	3.94	4	65/99/43	Done
9/23/2018	7:17:33	COND	12162589	uS/cm	2.97E+02	1438	1413	116	Done
9/23/2018	7:22:40	HDO	12162589	%SAT	9.88E+01	100.6	100	100	Done
10/2/2018	10:42:05	HDO	12162589	%SAT	9.62E+01	98	100	100	Done
10/30/2018	10:06:40	COND	12162589	uS/cm	2.67E+02	1490	1413	122	Done
10/30/2018	10:09:08	PH	12162589	pH	1.09E-01	4.12	4	62	
10/30/2018	10:11:05	PH	12162589	pH	-5.93E-02	7.04	7	67/96/40	Done
10/30/2018	11:02:52	HDO	12162589	%SAT	1.00E+02	101.8	100	100	Done
10/31/2018	7:29:56	PH	12162589	pH	1.11E-01	3.95	4	63	
10/31/2018	7:32:08	PH	12162589	pH	-5.91E-02	6.99	7	67/97/40	Done
10/31/2018	7:38:54	COND	12162589	uS/cm	2.75E+02	1396	1413	121	Done
10/31/2018	7:47:37	HDO	12162589	%SAT	9.76E+01	99.4	100	100	Done
11/1/2018	11:43:36	COND	12162589	uS/cm	2.80E+02	1409	1413	121	Done
11/1/2018	11:47:41	PH	12162589	pH	1.09E-01	4.03	4	62	
11/1/2018	11:49:39	PH	12162589	pH	-5.66E-02	6.95	7	68/95/43	Done
11/1/2018	11:59:47	HDO	12162589	%SAT	9.72E+01	99	100	100	Done
11/2/2018	7:49:22	COND	12162589	uS/cm	2.80E+02	1416	1413	121	Done
11/2/2018	7:54:32	PH	12162589	pH	1.07E-01	4.02	4	61	
11/2/2018	7:57:01	PH	12162589	pH	-5.64E-02	6.99	7	68/94/43	Done
11/2/2018	8:08:30	HDO	12162589	%SAT	1.01E+02	102.8	100	100	Done
11/3/2018	7:32:32	COND	12162589	uS/cm	2.75E+02	1402	1413	120	Done
11/3/2018	7:39:17	PH	12162589	pH	1.07E-01	4.01	4	61	
11/3/2018	7:43:01	PH	12162589	pH	-5.95E-02	7.05	7	66/95/40	Done
11/3/2018	7:58:23	HDO	12162589	%SAT	1.04E+02	106.3	100	100	Done
11/5/2018	11:39:42	COND	12162589	uS/cm	2.98E+02	1321	1413	112	Done
11/5/2018	11:44:30	PH	12162589	pH	1.05E-01	4.03	4	59	
11/5/2018	11:47:51	PH	12162589	pH	-6.06E-02	7.01	7	66/95/39	Done
11/5/2018	12:00:59	HDO	12162589	%SAT	9.11E+01	92.8	100	100	Done
11/18/2018	8:09:25	PH	12162589	pH	8.78E-02	4.28	4	50	
11/18/2018	8:12:57	PH	12162589	pH	-6.66E-02	7.1	7	63/89/33	Done
11/18/2018	8:17:09	COND	12162589	uS/cm	3.03E+02	1460	1413	116	Done
11/18/2018	8:20:43	HDO	12162589	%SAT	9.84E+01	100.2	100	100	Done
11/19/2018	14:16:04	PH	12162589	pH	-7.16E-02	7.09	7	60	
11/19/2018	14:17:46	PH	12162589	pH	9.04E-02	3.95	4	51/93/28	Done
11/19/2018	14:20:15	COND	12162589	uS/cm	3.05E+02	1409	1413	116	Done
11/19/2018	14:20:56	COND	12162589	uS/cm	3.03E+02	1416	1413	116	Done
11/19/2018	14:28:12	HDO	12162589	%SAT	1.01E+02	102.5	100	100	Done
11/25/2018	8:10:55	PH	12162589	pH	8.66E-02	4.07	4	49	
11/25/2018	8:14:28	PH	12162589	pH	-7.41E-02	7.04	7	58/92/25	Done
11/25/2018	8:19:40	COND	12162589	uS/cm	2.98E+02	1418	1413	116	Done

11/25/2018	8:28:47	HDO	12162589	%SAT	9.91E+01	100.9	100	100	Done
12/8/2018	9:06:10	COND	12162589	uS/cm	3.12E+02	1365	1413	112	Done
12/8/2018	9:09:51	PH	12162589	pH	8.86E-02	3.94	4	50	
12/8/2018	9:13:47	PH	12162589	pH	-7.22E-02	6.96	7	59/93/27	Done
12/8/2018	9:25:04	HDO	12162589	%SAT	9.32E+01	94.9	100	0	Done
12/9/2018	9:59:27	COND	12162589	uS/cm	2.76E+02	1475	1413	117	Done
12/9/2018	10:02:58	PH	12162589	pH	8.95E-02	4.02	4	51	
12/9/2018	10:04:54	PH	12162589	pH	-7.33E-02	7.01	7	59/93/26	Done
12/9/2018	10:13:58	HDO	12162589	%SAT	9.80E+01	99.8	100	100	Done
12/9/2018	14:39:49	PH	12162589	pH	9.55E-02	3.88	4	54	
12/9/2018	14:46:53	PH	12162589	pH	-7.50E-02	7.03	7	58/97/25	Done
12/10/2018	12:36:26	PH	12162589	pH	9.44E-02	4.05	4.01	54	
12/10/2018	12:41:05	PH	12162589	pH	-7.87E-02	7.06	0	0.007337037	Done
12/10/2018	12:45:08	PH	12162589	pH	-7.87E-02	0	7.01	56	
12/10/2018	12:51:16	PH	12162589	pH	9.49E-02	4.02	4.01	54/98/21	Done
12/15/2018	11:28:09	PH	12162589	pH	8.47E-02	4.13	4	48	
12/15/2018	11:30:53	PH	12162589	pH	-8.48E-02	7.11	7	52/97/15	Done
12/17/2018	9:22:04	PH	12162589	pH	1.37E-01	3.07	4	77	
12/17/2018	9:24:45	PH	12162589	pH	-3.28E-02	6.07	0	0.005547379	Done
12/17/2018	9:26:31	PH	12162589	pH	-3.33E-02	-0.01	7	81	
12/17/2018	9:28:06	PH	12162589	pH	1.38E-01	4.02	4	78/98/66	Done
12/17/2018	9:33:26	COND	12162589	uS/cm	2.93E+02	1401	1413	117	Done
12/17/2018	9:41:04	HDO	12162589	%SAT	9.85E+01	100.3	100	100	Done
12/20/2018	8:31:06	PH	12162589	pH	1.38E-01	3.99	4	78	
12/20/2018	8:34:23	PH	12162589	pH	-3.19E-02	6.97	7	82/98/68	Done
12/20/2018	8:38:59	COND	12162589	uS/cm	2.94E+02	1408	1413	116	Done
12/24/2018	9:35:07	PH	12162589	pH	1.40E-01	3.98	4.01	79	
12/24/2018	9:36:59	PH	12162589	pH	-3.24E-02	7	7	82/99/67	Done
12/24/2018	9:43:57	COND	12162589	uS/cm	2.87E+02	1410	1413	116	Done
12/24/2018	9:51:47	HDO	12162589	%SAT	9.92E+01	101	100	0	Done
12/24/2018	9:53:00	HDO	12162589	%SAT	9.86E+01	100.4	100	100	Done

* Data extracted from probe, File: cal.log2018.csv

Table 8.92: Whale Tail 2018 EEM QAQC

Effluent characterization Whale Tail North Basin (ST-MDMER-4-EEM)						
Date	Units	MDL	6-Aug-18			
Parameter / QAQC			Original	Duplicate	RPD	Field Blank
Alkalinity	mg CaCO3/L	2	17	17	0	6
Aluminium	mg/L	0.005	0.244	0.274	12	< 0.005
Ammonia nitrogen	mg N/L	0.01	0.04	0.03	**29**	< 0.01
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0	< 0.00002
Hardness	mg CaCO3/L	1	18	20	11	< 1
Iron	mg/L	0.01	0.06	0.07	15	< 0.01
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0	< 0.00001
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Nitrate	mg N/L	0.01	0.07	0.07	0	< 0.01
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
% Exceedances*					0%	

Water Quality Monitoring Exposure Area Whale Tail North Basin (ST-MDMER-4-EEM-WTN)						
Date	Units	MDL	6-Aug-18			
Parameter / QAQC			Original	Duplicate	RPD	Field Blank
Alkalinity	mg CaCO3/L	2	12	12	0	5
Aluminium	mg/L	0.005	0.108	0.124	14	< 0.005
Ammonia nitrogen	mg N/L	0.01	0.02	< 0.01	**67**	0.14
Arsenic	mg N/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0	< 0.00002
Copper	mg/L	0.0005	0.0005	< 0.0005	0	0.0016
Cyanide	mg/L	0.001	0.001	< 0.001	0	< 0.001
Hardness	mg CaCO3/L	1	17	15	13	< 1
Iron	mg/L	0.01	0.23	0.23	0	< 0.01
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0	< 0.0003
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0	< 0.00001
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Nickel	mg N/L	0.0005	0.0012	0.0013	8	< 0.0005
Nitrate	mg N/L	0.01	0.06	0.03	**67**	< 0.01
Radium 226	mg/L	NA	NA	NA		NA
Total suspended solids	mg/L	1	2	2	0	< 1
Selenium	mg/L	0.0005	< 0.0005	0.0009	**57**	< 0.0005
Zinc	mg/L	0.001	< 0.001	< 0.001	0	0.002
% Exceedances*					0%	

Water Quality Monitoring Reference Area Second Portage Lake (ST-EEM-TPS)						
Date	Units	MDL	6-Aug-18			
Parameter / QAQC			Original	Duplicate	RPD	Field Blank
Alkalinity	mg CaCO3/L	2	15	14	7	6
Aluminium	mg/L	0.005	< 0.005	< 0.005	0	< 0.005
Ammonia nitrogen	mg N/L	0.01	< 0.01	< 0.01	0	< 0.01
Arsenic	mg N/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0	< 0.00002
Copper	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Cyanide	mg/L	0.001	0.005	< 0.001	**133**	0.001
Hardness	mg CaCO3/L	1	6	5	18	< 1
Iron	mg/L	0.01	< 0.01	< 0.01	0	< 0.01
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0	< 0.0003
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0	0.00002
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Nickel	mg N/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Nitrate	mg N/L	0.01	0.02	0.03	**40**	< 0.01
Radium 226	mg/L	NA	NMR	NMR		NMR
Total suspended solids	mg/L	1	1	1	0	< 1
Selenium	mg/L	0.0005	0.0006	< 0.0005	18	< 0.0005
Zinc	mg/L	0.001	< 0.001	< 0.001	0	< 0.001

% Exceedances*		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 8.93: Whale Tail 2018 STP QAQC

Sample Date			2/26/2018			7/9/2018			9/24/2018			11/5/2018			12/3/2018				12/11/2018					12/17/2018			
Parameters	Units	MDL	Duplicate	Original	RPD	Duplicate	Original	RPD	Duplicate	Original	RPD	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD
NH4	mg-N/L	0.01	38.5	33.6	13.6	0.17	0.16	6.06	0.21	0.17	21.1	0.15	0.15	0.0	< 0.01	0.03	0.03	0.0	0.05	< 0.01	0.02	0.03	**40.0**	0.02	0.03	0.02	40.0
BOD5, Carbonaceous	mg/L	2	11	8	31.6	<1	<1	0	< 2	< 2	0.0	<1	<4	-	< 2	< 2	< 2	0.0	< 1	< 1	3	4	**28.6**	< 1	1	1	0.0
Fecal Coliforms	CFU/100mL	2	<2	<2	0.0	<2	<2	0	9	11	20.0	<1	<1	0.0	-	2	5	**85.7**	-	-	900	1100	20.0	-	34	270	*155.3*
Oil & Grease	mg/L	1	1	1	0.0	<1	<1	0	< 1	< 1	0.0	<1	<1	0.0	3	< 3	< 3	0.0	< 3	< 3	< 3	< 3	0.0	< 3	< 3	< 3	0.0
pH	pH units	-	7.35	7.35	0.0	6.58	6.63	0.76	6.03	5.89	2.3	7.57	7.52	0.7	5.63	7.61	7.61	0.0	5.49	5.56	7.37	7.36	0.1	5.56	7.36	7.35	0.1
Total Suspended Solids	mg/L	1	22	9.5	79.4	2	3	**40.00**	*2*	*2*	0.0	*2*	4	**66.7**	1	1	1	0.0	< 1	< 1	8	8	0.0	< 1	1	1	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 8.94: Whale Tail 2018 ST-WT-6 QAQC

Sample Date			8/30/2018			
Parameters	Units	MDL	Field Blank	Duplicate	Original	RPD
Conventional Parameters						
pH	pH units	-	-	-	7.57	-
Specific conductivity	uS/cm	-	1	-	165	-
Hardness	mg CaCO3/L	1	< 1	63	70	10.5
Total dissolved solids	mg/L	1	1	108	110	1.8
Total suspended solids	mg/L	1	< 1	2	< 1	**66.7**
Total organic carbon	mg/L	0.2	< 0.2	5.4	5.4	0.0
Dissolved organic carbon	mg/L	0.2	< 0.2	5	5.2	3.9
Major Ions						
Alkalinity	mg CaCO3/L	2	3	23	23	0.0
Bicarbonate	mg CaCO3/L	2	3	23	23	0.0
Carbonate	mg CaCO3/L	2	< 2	< 2	< 2	0.0
Chloride	mg/L	0.5	< 0.5	23.8	24.1	1.3
Sulphate	mg/L	0.6	< 0.6	25.9	20.8	21.8
Reactive Silica	mg/L	-	0.33	0.73	0.71	2.8
Nutrients and Chlorophyll a						
Ammonia Nitrogen	mg/L	0.01	< 0.01	0.01	0.01	0.0
Total Kjeldahl nitrogen	mg/L	0.05	< 0.05	0.37	0.35	5.6
Total phosphorus	mg/L	0.01	0.02	0.03	0.01	**100.0**
Orthophosphate	mg/L	0.01	<0.01	0.01	0.01	0.0
Total Metals						
Aluminum	mg/L	0.005	< 0.005	0.011	0.015	**30.8**
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	< 0.0005	0.0203	0.0229	12.0
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	< 0.00002	0.0
Calcium	mg/L	0.03	< 0.03	18.7	20.7	10.2
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	< 0.0006	0.0
Copper	mg/L	0.0005	0.0033	0.0007	0.0006	15.4
Iron	mg/L	0.01	< 0.01	0.2	0.18	10.5
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Magnesium	mg/L	0.02	< 0.02	4.2	4.54	7.8
Manganese	mg/L	0.0005	< 0.0005	0.02	0.017	16.2
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0.0005	0.0
Nickel	mg/L	0.0005	< 0.0005	0.0043	0.0044	2.3
Potassium	mg/L	0.05	< 0.05	1.85	2.05	10.3
Selenium	mg/L	0.0005	< 0.0005	0.0009	0.0008	11.8
Sodium	mg/L	0.05	< 0.05	1.11	1.29	15.0
Strontium	mg/L	0.005	< 0.005	0.092	0.11	17.8
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	< 0.01	0.02	0.02	0.0
Uranium	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	0.002	**66.7**
Dissolved Metals						
Aluminum	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.001	< 0.001	0.021	0.019	10.0
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	< 0.0006	0.0
Copper	mg/L	0.0005	0.0023	0.0011	0.0009	20.0
Iron	mg/L	0.01	< 0.01	0.02	0.01	**66.7**
Lithium	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Manganese	mg/L	0.0005	< 0.0005	0.02	0.0007	*186.5*
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0.0007	**33.3**

Nickel	mg/L	0.0005	< 0.0005	0.004	0.004	0.0
Selenium	mg/L	0.0005	< 0.0005	0.0009	0.0007	**25.0**
Strontium	mg/L	0.005	< 0.005	0.092	0.105	13.2
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	< 0.01	0.02	0.02	0.0
Uranium	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	< 0.001	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 2018 ST-WT-14 QAQC

Sample Date			8/31/2018			
Parameters	Units	MDL	Field Blank	Duplicate	Original	RPD
Field Measured						
Conductivity	uS/cm	-	1	-	57.3	-
Conventional Parameters						
pH	pH units	-	5.36	-	6.93	-
Specific conductivity	uS/cm	-	1	-	57	-
Hardness	mg CaCO3/L	1	< 1	20	19	5.1
Total dissolved solids	mg/L	1	1	38	38	0.0
Total suspended solids	mg/L	1	< 1	< 1	< 1	0.0
Total organic carbon	mg/L	0.2	0.3	1.7	1.2	**34.5**
Dissolved organic carbon	mg/L	0.2	< 0.2	1.7	1.1	**42.9**
Major Ions						
Alkalinity	mg CaCO3/L	2	3	7	7	0.0
Bicarbonate	mg CaCO3/L	2	3	7	7	0.0
Carbonate	mg CaCO3/L	2	< 2	< 2	< 2	0.0
Chloride	mg/L	0.5	< 0.5	10.9	10.8	0.9
Sulphate	mg/L	0.6	< 0.6	3.8	4.3	12.3
Silica	mg/L	-	0.36	0.59	0.55	7.0
Nutrients and Chlorophyll a						
Nitrate	mg/L	0.01	0.01	0.01	0.01	0.0
Nitrite	mg/L	0.01	<0.01	<0.01	<0.01	0.0
Ammonia Nitrogen	mg/L	0.01	0.02	0.03	< 0.01	**100.0**
Total Kjeldahl nitrogen	mg/L	0.05	0.07	< 0.05	0.11	**75.0**
Total phosphorus	mg/L	0.01	< 0.01	< 0.01	0.01	0.0
Orthophosphate	mg/L	0.01	<0.01	<0.01	<0.01	0.0
Total Metals						
Aluminum	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	< 0.0005	0.0103	0.0093	10.2
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	< 0.00002	0.0
Calcium	mg/L	0.03	< 0.03	6.12	5.65	8.0
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	< 0.0006	0.0
Copper	mg/L	0.0005	0.003	< 0.0005	< 0.0005	0.0
Iron	mg/L	0.01	< 0.01	< 0.01	0.01	0.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Magnesium	mg/L	0.02	< 0.02	1.34	1.31	2.3
Manganese	mg/L	0.0005	< 0.0005	0.0005	0.0007	**33.3**
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Nickel	mg/L	0.0005	< 0.0005	0.0007	0.0012	**52.6**
Potassium	mg/L	0.05	< 0.05	0.69	0.71	2.9
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Sodium	mg/L	0.02	< 0.02	0.71	0.68	4.3
Strontium	mg/L	0.005	< 0.005	0.051	0.05	2.0
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Uranium	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	0.002	< 0.001	**66.7**
Dissolved Metals						
Aluminum	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	< 0.0005	0.0069	0.0093	**29.6**
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	< 0.0006	0.0
Copper	mg/L	0.0005	0.0016	0.0007	0.0018	**88.0**
Iron	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0

Lithium	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Manganese	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Nickel	mg/L	0.0005	< 0.0005	0.0007	< 0.0005	**33.3**
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Strontium	mg/L	0.005	< 0.005	0.05	< 0.005	**163.6**
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Uranium	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	< 0.001	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 8.96: Whale Tail 2018 ST-WT-15 QAQC

Sample Date			8/31/2018			
Parameters	Units	MDL	Field Blank	Duplicate	Original	RPD
Conventional Parameters						
pH	pH units	-	5.55	5.7	5.7	0.0
Specific conductivity	uS/cm	-	2	59	58	1.7
Hardness	mg CaCO3/L	1	< 1	19	20	5.1
Total dissolved solids	mg/L	1	1	39	39	0.0
Total suspended solids	mg/L	1	< 1	< 1	1	0.0
Total organic carbon	mg/L	0.2	0.2	1.6	1.5	6.5
Dissolved organic carbon	mg/L	0.2	< 0.2	1.4	1.5	6.9
Major Ions						
Alkalinity	mg CaCO3/L	2	3	7	7	0.0
Bicarbonate	mg CaCO3/L	2	3	7	7	0.0
Carbonate	mg CaCO3/L	2	< 2	< 2	< 2	0.0
Chloride	mg/L	0.5	< 0.5	10.8	10.9	0.9
Sulphate	mg/L	0.6	< 0.6	2.6	2.8	7.4
Reactive silica	mg/L	-	0.31	0.63	0.59	6.6
Nutrients and Chlorophyll a						
Nitrate	mg/L	0.01	<0.01	0.04	0.04	0.0
Nitrite	mg/L	0.01	<0.01	<0.01	<0.01	0.0
Ammonia Nitrogen	mg/L	0.01	0.03	0.03	0.02	40.0
Total Kjeldahl nitrogen	mg/L	0.05	< 0.05	< 0.05	0.07	**33.3**
Orthophosphate	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Total phosphorus	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Total Metals						
Aluminum	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	< 0.0005	0.0076	0.0081	6.4
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	< 0.00002	0.0
Calcium	mg/L	0.03	< 0.03	5.55	5.85	5.3
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	< 0.0006	0.0
Copper	mg/L	0.0005	0.0037	0.0011	< 0.0005	**75.0**
Iron	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Lead	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Magnesium	mg/L	0.02	< 0.02	1.35	1.44	6.5
Manganese	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Nickel	mg/L	0.0005	< 0.0005	0.0007	0.0009	**25.0**
Potassium	mg/L	0.05	< 0.05	0.66	0.71	7.3
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Sodium	mg/L	0.05	< 0.05	0.67	0.73	8.6
Strontium	mg/L	0.005	< 0.005	0.038	0.049	**25.3**
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Uranium	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Dissolved Metals						
Aluminum	mg/L	0.005	< 0.005	0.014	< 0.005	**94.7**
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Barium	mg/L	0.0005	< 0.0005	0.0073	0.0083	12.8
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Boron	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	< 0.00002	0.0
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0.0007	15.4
Copper	mg/L	0.0005	0.0019	0.0005	0.0007	**33.3**
Iron	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Lithium	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.0
Manganese	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0

Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	0.0
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Nickel	mg/L	0.0005	< 0.0005	0.0009	0.001	10.5
Selenium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Strontium	mg/L	0.005	< 0.005	0.05	0.047	6.2
Thallium	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002	0.0
Tin	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Titanium	mg/L	0.01	< 0.01	< 0.01	< 0.01	0.0
Uranium	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0
Zinc	mg/L	0.001	< 0.001	< 0.001	0.001	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 8.97 : Whale Tail 2018 Eureka manta+ 30 calibration datasheets

Whale Tail 2018 Eureka manta+ 30 calibration datasheets																
Date	Standard	Turbidity (initial reading)	Turbidity (final reading)	Standard	pH (initial reading)	pH (final reading)	Calibration Slope	Standard	Conductivity (initial reading)	Conductivity (final reading)	Calibration Slope	Standard	DO% (initial reading)	DO% (final reading)	Calibration Slope	Initial
2-Aug-18	10	9.93	10.1	4.00				1413				100%				K.M
	0	0	0	7.00												
3-Aug-18	10	9.97	10.04	4.00				1413				100%				K.M
	0	0.05	0	7.00												
4-Aug-18	10	9.77	9.99	4.00				1413				100%				M.B
	0	0	0	7.00												
5-Aug-18	10			4.00				1413				100%				
	0			7.00												
6-Aug-18	10	10.01	9.9	4.00	4.05	4.02	83	1413	1514	1420	117	100%	113.8	101.6	100	M.B
	0	0.05	0.02	7.00	7.03	6.99										
7-Aug-18	10	8.49	10.02	4.00				1413				100%				M.A
	0	0	0.02	7.00												
8-Aug-18	10	9.65	9.82	4.00				1413				100%				
	0	0	0	7.00												
9-Aug-18	10			4.00				1413				100%				
	0			7.00												
10-Aug-18	10	10.14	9.93	4.00				1413				100%				
	0	0	0.03	7.00												
11-Aug-18	10	9.64	10.12	4.00				1413				100%				
	0	0	0	7.00												
12-Aug-18	10	9.39	9.94	4.00				1413				100%				
	0	0	0.02	7.00												
31-Aug-18	0	0.81	0	4.00	4.17	3.93										
	10	9.81	10.04	7.00	7.07	6.99	79	1413	1401	1416	117	100%	98.69	99.5	100	CML
	100			10.00												
1-Sep-18	0	0	0	4.00	4.70	7.13										
	10	10.31	9.8	7.00	3.91	6.91	72	1413	1409	1412	117	100%	101.59	99.6	100	KM
	100			10.00												
2-Sep-18	0	0	0	4.00	3.97	3.95										
	10	9.1	9.1	7.00	6.84	6.99	80	1413	1463	1414	99	100%	99.4	99.4	100	CML
	100			10.00												
3-Sep-18	0	0	0.01	4.00	4.01	3.97										
	10	9.1	10.14	7.00	7.07	6.99	76	1413		1416	116	100%	99.5	100.3	100	CML
	100			10.00												
4-Sep-18	0	0.15	0.02	4.00	3.91	3.98										
	10	9.93	10.18	7.00	6.92	6.99	81	1413	1422	1411	117	100%	99.5	99	100	KM
	100			10.00												
5-Sep-18	0	0	0	4.00												
	10	10.27	9.9	7.00				1413				100%				CML
	100			10.00												
6-Sep-18	0	0.23	0	4.00												
	10	9.94	9.73	7.00				1413				100%				
	100			10.00												
7-Sep-18	0	0	0	4.00												
	10	10.27	9.8	7.00				1413				100%				JP
	100			10.00												
8-Sep-18	0			4.00	4.02	3.97										
	10			7.00	7.03	6.99	80	1413	1417	1413	117	100%	110	98.9	100	
	100			10.00												
22-Sep-18	0			4.00	3.99	4										
	10			7.00	6.84	7	87	1413	1386	1413	111	100%	92.5	100.1	100	
	100			10.00												
23-Sep-18	0	0	0	4.00	3.95	3.99										
	10	9.92	9.8	7.00	7.00	7.01	43	1413	1438	1413	116	100%	100.5	100.4	100	CML
	100			10.00												
24-Sep-18	0	0	0	4.00	4.09	3.96										
	10	9.76	10.35	7.00	7.16	6.97	76	1413	1493	1412	117	100%	100.5	100.4	100	CML
	100			10.00												
25-Sep-18	0	0.21	0	4.00	4.05	7.01										
	10	9.82	9.97	7.00		6.98	75	1413	1396	1414	116	100%	100.19	100.2	100	CML
	100			10.00												
26-Sep-18	0	-0.18	0.01	4.00												
	10	10.06	10.05	7.00				1413				100%				CML
	100			10.00												
27-Sep-18	0	0.03	0.04	4.00	3.91	3.97										
	10	10.1	9.99	7.00	6.98	6.97	76	1413	1420	1409	116	100%	98.9	99.5	100	KM
	100			10.00												
28-Sep-18	0	0.07	-0.03	4.00												
	10	9.93	10.08	7.00				1413				100%				KM
	100			10.00												
2-Oct-18	0	-0.03	-0.03	4.00	3.96	3.99										
	10	9.97	9.83	7.00	6.86	7.01	83	1413	1407	1408	116	100%	98.7	100	100	TT
				10.00	9.76	10.01										
8-Oct-18	0	-0.27	0	4.00	3.89	3.99										
	10	9.47	9.96	7.00	6.90	7.01	87	1413	1400	1413	115	100%	98.8	100	100	ST
				10.00	10.02	10.01										
11-Oct-18	0	-0.1	0.01	4.00	4.11	3.97										
	10	9.82	9.99	7.00	7.07	6.99	82	1413	1401	1413	114	100%	104.1	99.7	100	ST
				10.00	10.00	10										
12-Oct-18	0	-0.01	0	4.00	3.97	4.01										
	10	10.38	10	7.00	6.98	7	82	1413	1409	1413	114	100%	97.8	100.4	100	ST
				10.00	9.96	10										
13-Oct-18	0	-0.05	0.01	4.00	3.98	3.99										
	10	10.32	9.99	7.00	7.01	7	81	1413	1410	1413	114	100%	101.09	99.7	100	ST
				10.00	9.97	10.01										
14-Oct-18	0	-0.05	0.02	4.00	3.94	3.99										
	10	10.01	10	7.00	6.96	7	83	1413	1413	1413	114	100%	98.59	100	100	ST
				10.00	10.01	10										
15-Oct-18	0	0.09	-0.02	4.00	3.96	4.00										
	10	10.56	10.01	7.00	6.96	7.01	84	1413	1409	1413	113	100%	97.40	99.60	100	ST
				10.00	10.01	9.99										
16-Oct-18	0	-0.23	0.00	4.00	4.09	4.02										
	10	9.56	10.02	7.00	7.03	6.99	81	1413	1395	1411	112	100%	99.50	100.00	100	ST
				10.00	10.00	10.00										
17-Oct-18	0	0.40	0.03	4.00	3.96	4.02										
	10	9.75	10.01	7.00	6.88	7.00	82	1413	1423	1413	113	100%	104.00	100.10	100	ST
				10.00	10.00	10.00										
18-Oct-18	0	0.05	-0.04	4.00	3.94	7.03										
	10	10.02	10.13	7.00	4.02	6.97	78	1413	1414	1413	113	100%	97.40	98.80	100	KM
				10.00												
19-Oct-18	0	-0.02	0.03	4.00	3.99	3.98										
	10	9.85	9.83	7.00	6.84	6.99	81	1413	1411	1412	113	100%	99.80	98.80	100	KM
				10.00												
20-Oct-18	0	-0.11	0.00	4.00												
	10	10.05	9.96	7.00				1413	1404	1412	112	100%				KM
				10.00												
21-Oct-18	0	-0.05	-0.03	4.00												
	10	9.85	10.02	7.00				1413	1411	1412	112	100%				KM
				10.00												
22-Oct-18	0	0.03	0.03	4.00	3.94	3.98										
	10	9.93	10.09	7.00	6.92	6.99	86	1413	1420	1412	112	100%	101.40	99.00	100	KM
				10.00												
29-Oct-18	0	0.05	0.03	4.00	4.05	4.02										
	10	9.93	10.10	7.00	7.05	7.02	82	1413	1407	1412	112	100%	99.50	99.50	100	KM
				10.00	10.13	9.98										
30-Oct-18	0	-0.12	-0.38	4.00	4.01	3.91										
	10	9.93	9.98	7.00	7.01	6.90	81	1413	1409	1411	112	100%	100.69	99.00	100	KM
				10.00	9.98	9.98										
31-Oct-18	0	-0.30	-0.03	4.00	4.00	4.00										
	10	9.76	10.02	7.00	6.96	7.01	84	1413	1406	1412	111	100%	99.50	99.70	100	ST
				10.00	9.96	9.99										
1-Nov-18	0	0.02	0.00	4.00	4.01	4.00										
	10	10.46	10.01	7.00	7.03	6.99	81	1413	1395	1412	110	100%	100.50	100.20	100	ST
				10.00	10.02	10.01										
2-Nov-18	0	0.00	0.00	4.00	4.08	3.99										
	10	10.03	9.93	7.00	7.02	7.02	82	1413	1414	1414	111	100%	105.09	100.20	100	BP
				10.00	10.01	10.03										
3-Nov-18	0	0.00	-0.01	4.00	4.00	3.99										
	10	9.89	9.99	7.00	6.96	7.01	82	1413	1409	1413	110	100%	97.19	99.70	100	ST
				10.00	9.97	9.99										
4-Nov-18	0	0.03	0.01	4.00	3.97	4.00										
	10	9.81	10.01	7.00	7.01	6.99	81	1413	1405	1413	109	100%	98.72	99.90	100	ST
				10.00	9.98	10.00										
25-Nov-18	0	0.01	0.01	4.00	3.96	3.90										
	10	9.94	10.05	7.00	7.01	6.96	81	1413	1400	1412	107	100%	100.60	99.90	100	LD
				10.00	9.98	10.00										
26-Nov-18	0	0.01	-0.15	4.00	4.09	3.94										
	10	10.01	10.12	7.00	7.11	6.89	74	1413	1434	1410	109	100%	98.69	99.80	100	LD
				10.00	10.09	9.99										
27-Nov-18	0	-0.11	-0.09	4.00	4.05	3.96										
	10	10.14	10.02	7.00	6.96	7.01	76	1413	1402	1412	108	100%	101.50	99.30	100	KM
				10.00	10.02	10.00										
29-Nov-18	0	-0.2	0	4.00	3.93	3.99										
	10	9.81	10.03	7.00	6.96	7	80	1413	1394	1412	107	100%	99.50			
				10.00	9.86	10.01										
3-Dec-18	20	20.6	19.9	4.00	3.95	3.97										
	100	99.4	96.5	7.00	7.01	7.02	80	1413	1471	1414	111	100%	106.90	99.50	100	IC
	800	X	803	10.00	10.10	10										
12-Dec-18	0	0.37	0.05	4.00	3.91	4.05										
	10	9.95	10.63	7.00	7.03	7.04	76	1413	1378	1412	108	100%	91.09	100.30	100	LD
				10.00	9.84	10.04										
13-Dec-18	0	-0.07	0.02	4.00	4.21	3.98										
	10	9.96	10.24	7.00	7.01	7.00	76	1413	1402	1413	107	100%	100.00	100.00	100	KM
				10.00	10.05	10.00										
14-Dec-18	0	0.05	0.03	4.00	3.98	3.98										
	10	10.02	10.05	7.00	6.96	7.01	77	1413	1408	1412	107	100%	99.59	99.05	100	KM
				10.00	9.98	10.00										
16-Dec-18	0	-0.07	-0.02	4.00	4.07	4.03										
	10	10.15	10.06	7.00	7.00	7.00	72	1413	1409	1413	107	100%	101.50	99.80	100	KM
				10.00	10.03	10.00										
18-Dec-18	0	0.05	-0.06	4.00	4.05	3.92										
	10	9.86	10.06	7.00	7.00	7.04	72	1413	1409	1414	106	100%	99.50	100.00	100	KM
				10.00	10.01	10										
30-Dec-18	0	0.1	0.06	4.00	4.05	4.01										
	10	9.85	10.03	7.00	7.05	6.99	69	1413	1410	1413	106	100%	101.59	99.90	100	ST
				10.00	9.98	10										

Table 8.99: Meadowbank 2018 Mill Seepage Water Quality Monitoring

Date	Mill Trench				MW-05				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)
Regulatoy guideline Water License	1	NA	0.2	NA	1	NA	0.2	NA	1	NA	0.2	NA	1	NA	0.2	NA
Regulatoy guideline MDMER	1	NA	0.6	NA	1	NA	0.6	NA	1	NA	0.6	NA	1	NA	0.6	NA
Regulatoy 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
2014																
5/26/2014	0.087		0.01	1	Dry				Dry				Dry			
6/17/2014	0.44	0.061	0.057	1.6	Dry				Dry				0.024	<0.005	0.11	0.41
7/21/2014	0.38	0.020	0.031	1.6	<0.005	<0.01	0.031	2.2	0.046	<0.01	0.1	9.4	<0.005	<0.01	0.014	0.43
8/19/2014	0.17	0.028	0.012	1.5	Dry				Dry				<0.005	<0.01	0.055	6.40
9/29/2014	0.03		0.008	0.77	Dry				Dry				Dry			
11/18/2014	Frozen				Dry				Dry				Dry			
2015																
7/29/2015	0.024		0.005	0.72	<0.005		0.13	1.49	Dry				<0.005		0.27	2.92
8/4/2015	0.038	<0.005	0.008	0.6	Dry				Dry				<0.005	<0.005	0.17	17.2
9/17/2015	0.030		0.005	0.2	Dry				0.008	<0.005	0.047	4.53	<0.005	<0.005	0.016	8.1
2016																
5/16/2016	Frozen				Dry				Frozen				Frozen			
8/8/2016	0.022	0.016	0.0254	0.3	Dry				<0.005	<0.005	0.2948	39.8	<0.005	<0.005	0.3709	62.8
8/16/2016	No sample taken				Dry				0.007		0.1811	27.8	<0.005		0.1142	19.8
9/6/2016	0.007				Dry				<0.005				Not enough water			
10/14/2016	Frozen				Dry				0.005				Dry			
2017																
6/3/2017	No sample taken				Dry				Frozen				Frozen			
6/11/2017	0.057		0.0047	1.33	Dry				Frozen				Frozen			
7/4/2017	No sample taken				<0.005				<0.005				<0.005			
7/9/2017	0.024	0.017	0.0042		Not enough water				<0.001				Not enough water			
7/14/2017	0.028	<0.005	0.0021		Not enough water				No sample taken				Not enough water			
7/18/2017	0.013	<0.005	0.003	0.36	<0.01	<0.005			0.002	<0.005	0.0668	23.8	<0.005		0.0258	10.5
7/28/2017	0.011	<0.005	0.0039		Not enough water				No sample taken				Dry			

8/22/2017	0.021	0.005	0.0026	0.61	Dry	0.013	<0.005	0.3535	161	Dry
9/19/2017	0.005	0.005	0.0049	0.05	Dry	0.011	<0.005	0.1432	25.9	Dry
2018										
6/28/2018	Frozen				Frozen	Frozen				Frozen
7/16/2018	0.016	0.014	0.0047	0.18	Not enough water	Equipment broken				Equipment broken
8/20/2018	0.014	0.015	0.0052	0.08	Not enough water	Equipment broken				Equipment broken
9/17/2018	0.006	<0.005	0.0038	0.08	Not enough water	No sample taken				Dry
9/24/2018	No sample taken				Not enough water	0.004	<0.005	0.0513	20.3	Dry

Table 8.100: Meadowbank 2018 Water Quality Monitoring at TPL as per FAP and KIA

Date	Regulatory Guideline			Units	20-Aug-18	17-Sep-18
	Water License	MDMER	CCME			
Field Parameters						
pH (Env. Dept.)					7.35	7.53
Conductivity (Env. Dept.)				µmhos/cm	96.5	113.7
Turbidity (Env. Dept.)				NTU	1.18	0.72
Temperature				˚C	7.6	8.8
Dissolved oxygen				mg/L	NA	NA
Conventional Parameters						
Hardness				mg CaCo3/L	34	32
Alkalinity				mg CaCo3/L	35	25
TDS				mg/L	58	60
TSS				mg/L	<1	1
Colour				colour	<1	<1
D.O.C				mg/L	2.3	2.4
T.O.C				mg/L	2.6	2.5
Nutrients and Biological Indicators						
Ammonia (NH3)				mg N/L	<0.01	0.01
Ammonia nitrogen (NH3-NH4)				mg N/L	0.02	<0.01
Kjeldahl nitrogen				mg N/L	0.13	0.19
Nitrate				mg/L	0.01	0.01
Nitrite				mg/L	<0.01	<0.01
Ortho-phosphate (O-PO4)				mg P/L	<0.01	<0.01
Chlorophyll A				µg/L	0.86	0.04
Major Ions						
Bromides				mg/L	0.04	0.05
Chloride				mg/L	4.2	4.6
Fluoride				mg/L	0.14	0.1
Sulphate				mg/L	11	13.4
Thiosulfates (S2O3)				S2O3/L	<0.02	<0.02
Cyanide						
Cyanide Total	1	1	NA	mg/L	<0.001	<0.001
Cyanide Free (SGS)	NA	NA	0.005	mg/L	<0.005	< 0.005
Cyanide WAD				mg/L	<0.001	<0.001
Thiocyanates (SNC)				SCN/L	<0.05	<0.05

Date	Water License	MDMER	CCME	Units	20 Aug 18	17 Sep 18
Dissolved metals						
Aluminium				mg/L	<0.005	0.028
Antimony				mg/L	<0.0001	<0.0001
Arsenic				mg/L	<0.0005	<0.0005
Boron				mg/L	<0.01	<0.01
Barium				mg/L	0.003	0.0034
Beryllium				mg/L	<0.0005	<0.0005
Cadmium				mg/L	<0.00002	<0.00002
Chromium				mg/L	<0.0006	<0.0006
Cobalt				mg/L	<0.0005	<0.0005
Copper				mg/L	<0.0005	0.0007
Iron				mg/L	<0.01	<0.01
Lead				mg/L	<0.0003	0.0005
Lithium				mg/L	<0.005	<0.005
Manganese				mg/L	<0.0005	0.0008
Magnesium				mg/L	2.57	2.76
Mercury				mg/L	<0.00001	<0.00001
Molybdenum				mg/L	<0.0005	<0.0005
Nickel				mg/L	<0.0005	0.0006
Selenium				mg/L	<0.0005	<0.0005
Strontium				mg/L	0.044	0.045
Silver				mg/L	<0.0001	<0.0001
Tin				mg/L	<0.001	<0.001
Thallium				mg/L	<0.0002	<0.0002
Titanium				mg/L	<0.01	0.01
Uranium				mg/L	<0.001	<0.001
Vanadium				mg/L	<0.0005	<0.0005
Zinc				mg/L	<0.001	0.001

Date	Water License	MDMER	CCME	Units	20 Aug 18	17 Sep 18
Total metals						
Aluminium				mg/L	<0.005	0.013
Antimony				mg/L	<0.0001	<0.0001
Arsenic				mg/L	<0.0005	<0.0005
Boron				mg/L	<0.01	<0.01
Barium				mg/L	0.0032	0.003
Beryllium				mg/L	<0.0005	<0.0005
Cadmium				mg/L	<0.00002	<0.00002
Copper	0.2	0.6	0.002	mg/L	0.0006	0.001
Chromium				mg/L	0.0006	<0.0006
Cobalt				mg/L	<0.0005	<0.0005
Iron	NA	NA	0.3	mg/L	0.03	0.02
Lithium				mg/L	<0.005	<0.005
Manganese				mg/L	0.004	0.0029
Magnesium				mg/L	2.63	2.54
Mercury				mg/L	<0.00001	<0.00005
Molybdenum				mg/L	<0.0005	<0.0005
Nickel				mg/L	0.0009	0.0009
Lead				mg/L	0.002	<0.0003
Phosphorus				mg P/L	0.0021	0.025
Potassium				mg/L	1.08	1.14
Selenium				mg/L	<0.0005	0.0006
Silica				mg/L	0.38	0.3
Silver				mg/L	<0.0001	<0.0001
Tin				mg/L	<0.001	<0.001
Strontium				mg/L	0.0045	0.055
Titanium				mg/L	<0.01	0.01
Thallium				mg/L	<0.0002	<0.0002
Tellurium				mg/L	<0.0005	<0.0005
Uranium				mg/L	<0.001	<0.001
Vanadium				mg/L	<0.0005	<0.0005
Zinc				mg/L	<0.001	<0.001

Table 10.1 - Medowbank and Whale Tail Management Plan Approval by NWB

Site	Permit / License	Management Plan	Last date revision	Date NWB approval	Changes Significant for 2018 Plan update	Comments
Meadowbank	2AM-MEA1526	Groundwater Monitoring Plan	Version 9, March 2019	NA	No	Approved as part of the Water License 2AM-MEA1525 Renewal in 2015. New version submitted each year to reflect changes in operation
Meadowbank	2AM-MEA1526	Water Quality Monitoring and Management Plan for Dike Construction Vault Dike Addendum	Plan Version 4, April 2010 Vault Dike Addendum Version 1, July 2016	NA	NA	Approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Vault Dike addendum - no comments from NWB received
Meadowbank	2AM-MEA1526	Water Quality and Flow Monitoring Plan	Version 5, March 2016	NA	NA	Version 4, January 2015 approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Updated version submitted as part of the annual report.
Meadowbank	2AM-MEA1526	Interim Closure and Reclamation Plan	Version 3, June 2018	pending	NA	Version 2, January 2014 approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Agnico response to regulator comments on October 22, 2018 regarding the udated 2018 version - no formal approval received from NWB
Meadowbank	2AM-MEA1526	Operational ARD-ML Sampling and Testing	Version 2, November 2013	NA		Version 2 November 2013 approved as part of the Water License 2AM-MEA1525 Renewal in 2015
Meadowbank	2AM-MEA1526	Baker Lake Bulk Fuel Storage Facility: Environmental Performance Monitoring Plan	Version 4 August 018	ok	No	Version 3 June 2014 approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Version 4 August 2018 updated version submitted as part of the 2018 Annual Report and for the Water License modification for BL tank farm expansion
Meadowbank	2AM-MEA1526	Incinerator Management Plan	Version 8, September 2018	November 29, 2018	NA	
Meadowbank	2AM-MEA1526	Landfarm Design and Management Plan Version 3 (Feb. 2013	Version 4, March 2017	ok	NA	Version 3 February 2013 approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Version 4 March 2017 submitted as part of the annual rpeort - no comments received from NWB
Meadowbank	2AM-MEA1526	Landfill Design Management Plan	Version 4, September 2018	November 29, 2018	NA	
Meadowbank	2AM-MEA1526	Ammonia Management Plan Whale Tail addendum	Plan Version 2, March 2015 WT addendum Version 1, June 2016	ok	NA	Version 1 February 2013 approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Updated version submitted as part of the annual report - no comments received from NWB
Meadowbank	2AM-MEA1526	Dewatering Dike : Operation, Maintenance and Surveillance Manual	Version 8, February 2019	ok	No	Version 3, September 2013 approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Updated version submitted as part of the annual report - no comments received from NWB

Meadowbank	2AM-MEA1526	Freshet Action and Incident Response Plan	Version 7, March 2019	ok	No	April 2014 version approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Updated version submitted as part of the annual report - no comments received from NWB
Meadowbank	2AM-MEA1526	Tailings Storage Facility : Operation, Maintenance and Surveillance Manual	Version 9, February 2019	ok	No	Version 3, September 2013 approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Updated version submitted as part of the annual report - no comments received from NWB
Meadowbank	2AM-MEA1526	Mine Waste Rock and Tailings Management Report and Plan	Version 8, March 2019	ok	No	Version 1, March 2014 approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Updated version submitted as part of the annual report - no comments received from NWB
Meadowbank	2AM-MEA1526	Water Management Report and Plan	Version 7, March 2019	ok	No	Version 7, March 2014 approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Updated version submitted as part of the annual report - no comments received from NWB
Meadowbank	2AM-MEA1526	Operation and Maintenance Manual: Sewage Treatment Plan	Version 6, March 2017	ok	NA	Version 4, April 2013 approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Updated version submitted as part of the annual report - no comments received from NWB
Meadowbank/Whale Tail	2AM-MEA1526 / 2AM-WTP1826	Aquatic Effects Management Program (AEMP)	Version 3, November 2015	NA	NA	Approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Also Approved as part of the Water License 2AM-WTP1826 permitting process
Meadowbank/Whale Tail	2AM-MEA1526 / 2AM-WTP1826	Core Receiving Environment Monitoring Program (CREMP) Addendum Whale Tail Appendix A Mercury Monitoring Plan for Whale Tail South Area	CREMP Version 2, November 2015 Addendum WT Version 1, May 2018 Appendix A Mercury Monitoring Plan for Whale Tail South Area Version 2 March 2019	November 9, 2018	No - see comments	CREMP November 2015 - Approved as part of the Water License 2AM-MEA1525 CREMP WT Addendum - Approved as part of the Water License 2AM-WTP1826 permitting process Appendix A Mercury Monitoring Plan - Last aprroved by NWB on November 9, 2018. Resubmitted as part of the 2018 Annual Report, as requested by NWB in the approval letter, to fullfill ECCC comments
Meadowbank/Whale Tail	2AM-MEA1526 / 2AM-WTP1826	Quality Assurance/Quality Control (QA/QC) Plan	Version 4, March 2019	NA	No	Version 2, June 2014 approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Version 3, october 2015 approved as part of the permitting process for Water License 2AM-WTP1826 Version 4, March 2019 updated version to inlcude Whale Tail.
Meadowbank/Whale Tail	2AM-MEA1526/2AM-WTP1826	Emergency Response Plan Emergency Response Plan, Version Whale Tail	Version 12, January 2017	NA	NA	Version 6, August 2013 approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Updated version submitted as part of the annual report. Version WT June 2016 - approved asp art of the permitting process for the Water License 2AM-WTP1826

Meadowbank/Whale Tail	2AM-MEA1526 / 2AM-WTP1826	Hazardous Materials Management Meadowbank Mine Site, Whale Tail Pit Site, Baker Lake Facilities	Version 4, March 2019	NA	No	Version 3, October 2013 approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Updated version submitted as part of the annual report. Version WT, June 2016 approved as part of hte permititng process for the Water License 2AM-WTP1826 Version 4, March 2019 updated version to inlcude Whale Tail.
Meadowbank/Whale Tail	2AM-MEA1526 / 2AM-WTP1826	Spill Contingency Plan; MBK mine site, AWAR, Whale Tail Pit, Whale Tail Haul Road, BL Facilities	Version 7, February 2019	NA	No	Version 4 November 2013 approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Updated version submitted as part of the annual report. Versrion WT June 2016 approved as part of the permititng process for Water License 2AM-WTP1826 Version 7 February 2019 updated version to inlcude Whale Tail
Meadowbank/Whale Tail	2AM-MEA1526/2AM-WTP1826	MBK and Whale Tail Bulk Fuel Storage Facility Meadowbank Bulk Fuel Storage Facility: Environmental Performance Monitoring Plan	Version 4, March 2019	ok	No	Version 2 June 2014 approved as part of the Water License 2AM-MEA1525 Renewal in 2015. Version WT June 2016 approved by NWB as part of permitting process for the Water License 2AM-WTP1826 Version 4 March 2019 submitted as part of the 2018 Annual Report and to include Whale Tail
Whale Tail	2AM-WTP1826	Groundwater Monitoring Plan	Version 2.1, February 2019	Pending	Yes	
Whale Tail	2AM-WTP1826	Arsenic Water Treatment Plan Operation and Maintenance Manuel	Version 2, January 2019	February 11, 2019	NA	
Whale Tail	2AM-WTP1826	Water Quality Monitoring and Management Plan for Dike Construction and Dewatering	Version 1, January 2017	NA	NA	Approved as part of the permitting process for the Water License 2AM-WTP1826
Whale Tail	2AM-WTP1826	Water Quality and Flow Monitoring Plan	Version 6, March 2019	NA	No	Version 5 October 2018 previously approved by NWB on Jan 21, 2019. Version 6, March 2019 submitted as part of the 2018 Annual Report ot reflect modification to Water License Schedule 1
Whale Tail	2AM-WTP1826	Interim Whale Tail Closure and Reclamation Plan	Version WT, June 2016	NA	NA	Approved as part of the permitting process for the Water License 2AM-WTP1826
Whale Tail	2AM-WTP1826	Operational ARD-ML Sampling and Testing Plan	Version 4, March 2019	NA	No	Version 3 approved by NWB on January 28, 2019 Version 4 March 2019 submitted asp art of the 2018 annual report
Whale Tail	2AM-WTP1826	Landfill and Waste Management Plan	Version 1, January 2017	ok	NA	Approved as part of the permitting process for the Water License 2AM-WTP1826
Whale Tail	2AM-WTP1826	Dewatering Dike : Operation, Maintenance and Surveillance Manual	Version 1, March 2019	ok	Yes	Submitted as part of the 2018 Annual Report for approval
Whale Tail	2AM-WTP1826	Waste Rock Management Plan	Version 4, Octboer 2018	January 21, 2019	NA	
Whale Tail	2AM-WTP1826	Water Management Report and plan	Version 3, October 2018	January 21, 2019	NA	
Whale Tail	2AM-WTP1826	Sewagw Treatment Plan - operation and maintenance manuel	Version 2, February 2019	February 27, 2019	NA	
Whale Tail	2AM-WTP1826	Whale Tail Pit Haul Road Management Plan	Version 2, March 2019	ok	No	Version 1 June 2016 approved as part of the permitting proces for the Water License 2AM-WTP1826