



AGNICO EAGLE

MEADOWBANK DIVISION

WHALE TAIL PIT

Water Quality and Flow Monitoring Plan

MAY 2019

VERSION 6_NWB

EXECUTIVE SUMMARY

The purpose of this Water Quality and Flow Monitoring Plan is to establish the program to be implemented and followed by Agnico Eagle's environmental management team to monitor the performance of the waste and water management systems at the Whale Tail Pit Project.

The Plan is one component of the *Aquatic Effects Management Program* (AEMP) and is closely associated with the *Water Management Plan* and the Core Receiving Environment Management Plan (CREMP). The Water Quality and Flow Monitoring Plan summarizes the monitoring locations, sampling frequency, monitoring parameters, compliance discharge criteria and an adaptive management plan for water quality at the Whale Tail Pit.

Section 2 in this Plan includes an overview of the monitoring programs and mine development schedule. Section 3 provides specific details (including sampling locations and parameters to be measured) for the compliance monitoring program, along with general guidance for the event monitoring program. An adaptive management program is described for both regulated discharges and non-regulated discharges in Section 3 as well. Requirements of the flow monitoring program are described in Section 4, and an overview of the reporting requirements is described in Section 5.

This Plan has been updated to meet terms and conditions 17 and 18 in Project Certificate No. 008 and Type A Water License 2AM-WTP1826. This plan has been updated for the Expansion Project in support of the Nunavut Water Board (NWB) Type A Water License Amendment Process.

IMPLEMENTATION SCHEDULE

This Plan will be implemented immediately, subject to any modifications proposed by the NWB as a result of the review and approval process.

DISTRIBUTION LIST

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Environmental General Supervisor
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Environmental Technicians
Engineering Superintendent
Geotechnical Coordinator
Water Engineer

DOCUMENT CONTROL

Version	Date (YMD)	Section	Page	Revision
1	January 2017			Comprehensive plan for Whale Tail Pit project.
2	May 2017	1.0	1	Updated to include sampling station during post-closure (based on Commitment #2 from the Technical Meeting April 28-May 2, 2017; Agnico Eagle 2017)
	May 2017	Figure 2.4	-	Updated to include sampling station during post-closure (based on Commitment #2 from the Technical Meeting April 28-May 2, 2017; Agnico Eagle 2017)
	May 2017	Table 3-1	-	Updated to include sampling station during post-closure (based on Commitment #2 from the Technical Meeting April 28-May 2, 2017; Agnico Eagle 2017)
3	May 2018	All	multiple	Updated to meet Nunavut Impact Review Board Project Certificate Number 008, Term and Conditions 17 and 18.
4	August 2018	All	multiple	Updated to align with NWB Water Licence 2AM-WTP1826
5	October 2018	2.3, 3.1	multiple	Updated to align with recommendations issued by CIRNAC and ECCC in October 2018 Updated to align with recommendations issued by CIRNAC and ECCC in October 2018
6_NIRB	November 2018	All	multiple	Updated for the Expansion Project and submission to the Nunavut Impact Review Board
6_NWB	May 2019	All	multiple	Updated for the Expansion Project in support of the Nunavut Water Board (NWB) Type A Water License Amendment Process

Prepared by:

Agnico Eagle Mines Limited - Meadowbank Division

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SECTION 1. INTRODUCTION

The Water Quality and Flow Monitoring Plan (the Plan) has been prepared to meet Type A water Licence requirements (Water Licence 2AM-WTP1826, including modified Schedule I as approved by the Nunavut Water Board (NWB) through Board Motion NO. 2018-A1-023, dated December 6, 2018, as required by Part G, Item 2 of the Licence), and Project Certificate No.008. This Plan is one component of the Aquatic Effects Management Program (AEMP) and is closely associated with the Water Management Plan and the Core Receiving Environment Management Plan (CREMP). The Plan summarizes the monitoring locations, sampling frequency, monitoring parameters, compliance discharge criteria and an adaptive management plan for water quality at the Whale Tail Pit and Expansion Project. This plan has been updated for the Expansion Project in support Nunavut Water Board (NWB) for the Type A Water Licence amendment process.

The purpose of this Water Quality and Flow Monitoring Plan is to establish the program to be implemented and followed by Agnico Eagle's environmental management team to monitor the performance of the waste and water management systems for the Project. The program includes:

- A Plan to verify and validate the results of predictive water quality modelling with empirical measurements of the mine site water quality and flows;
- An assessment of the effects of project activities and infrastructure on surface water quality conditions;
- A comparison of measured water quality data to compliance requirements;
- A monitoring plan with documentation to track the quantity of water that contacts mine ore and wastes, management of contact water to protect aquatic resources, and water conservation and recycling; and
- A framework for adaptive management that allows the identification and rectification, where necessary, of unexpected trends or non-compliance in water quality and flows.

The Plan provides information on the locations of the monitoring stations at the various stages of mining. These monitoring locations are used to evaluate the performance of the mine waste and water management system.

The objectives of the monitoring program are:

- 1) to track the chemistry of the contact and non-contact water prior to and during discharge;
- 2) to assist in identifying if water treatment is required prior to discharge;
- 3) to minimize the potential impacts of mining activities on the surrounding environment;
- 4) to confirm that non-contact water is clean; and
- 5) to demonstrate contact water is being captured and managed accordingly.

Additional locations outside the footprint of the Amaruq property (and outside the scope of this Plan) are monitored under the Aquatic Effects Management Program and the Core Receiving Environmental Monitoring Plan (Azimuth 2015, 2016, 2018a, 2018b).

There are three main surface water quality monitoring programs designed for the monitoring and protection of the receiving environment:

- Water Quality Monitoring and Management Plan for Dike Construction Dewatering

- Water Quality and Flow Monitoring Plan
- Core Receiving Environment Monitoring Program

Through these combined programs, water quality will be monitored at various locations (including two reference lakes), at least annually, and during all phases of the project.

SECTION 2. BACKGROUND

2.1 OVERVIEW OF SITE WATER MANAGEMENT PLAN

Details of overall water management are discussed in the Whale Tail Pit Water Management Plan which is updated as needed to reflect changes in operation and/or technology or as otherwise required by a Water Licence. All contact water from the mine facilities including the waste rock storage facilities (WRSFs), Whale Tail and IVR open pits, and other disturbed areas will be directed by pumping or berms and other surface diversions to either of the following:

- Sumps from which the water will be pumped to the Whale Tail Pit Attenuation Pond, the IVR Attenuation Pond, and the Groundwater Storage Ponds; or
- The open pits during re-flooding and after mining activity has ceased.

As specified in the Water Management Plan: All contact water will be intercepted, contained, analyzed, treated, if required, and discharged to the receiving environment only when water quality meets the discharge criteria. The Water Management Plan is intended to ensure appropriate destination and treatment of contact water as well as water conservation and recycling to minimize the use of natural water.

2.2 MONITORING PROGRAMS

The Water Quality and Flow Monitoring Plan has been divided into two levels of monitoring to characterize the range of potential effects between the sources of contact water in the individual mine facilities and the point of discharge or release to the receiving environment. The two levels of monitoring include:

- 1) compliance monitoring; and
- 2) event monitoring.

2.2.1 Compliance Monitoring Program (CM)

The compliance monitoring (CM) sites are those stipulated in a water Licence; these sites vary from contact water collection ditches and attenuation ponds to sampling in areas prior to discharge to the receiving environment. The requirements of the Water Licence 2AM-WTP1826 including water quality limits will be applied at the applicable mine discharge points identified in the CM program.

The CM program provides a mechanism to assess water quality at specified sites, to confirm and to document compliance of discharge with regulatory requirements. As part of adaptive water management, these internal monitoring stations provide protection to the receiving water environment, provide data to predict pit re-flooding water quality and ensure exceedances of predicted or regulated levels are appropriately managed or mitigated to reduce impacts.

The water quality and flow monitoring program was designed as a complimentary plan to the Core Receiving Environment Monitoring Program – Whale Tail Pit Addendum (CREMP; Azimuth 2016), the Groundwater Monitoring Plan and the Water Quality Monitoring and Management Plan for Dike Construction Dewatering.

2.2.2 Event Monitoring Program (EM)

The EM sites result from unexpected events such as spills, accidents, and malfunctions. The response programs for such events are discussed in greater detail in the following documents:

- Spill Contingency Plan;
- Emergency Response Plan; and
- Whale Tail Pit Water Management Plan.

Each accidental release will require mobilization of site equipment to stabilize the release, procedures to contain, neutralize, and dispose of the discharge, and recommendations for monitoring the site following the incident.

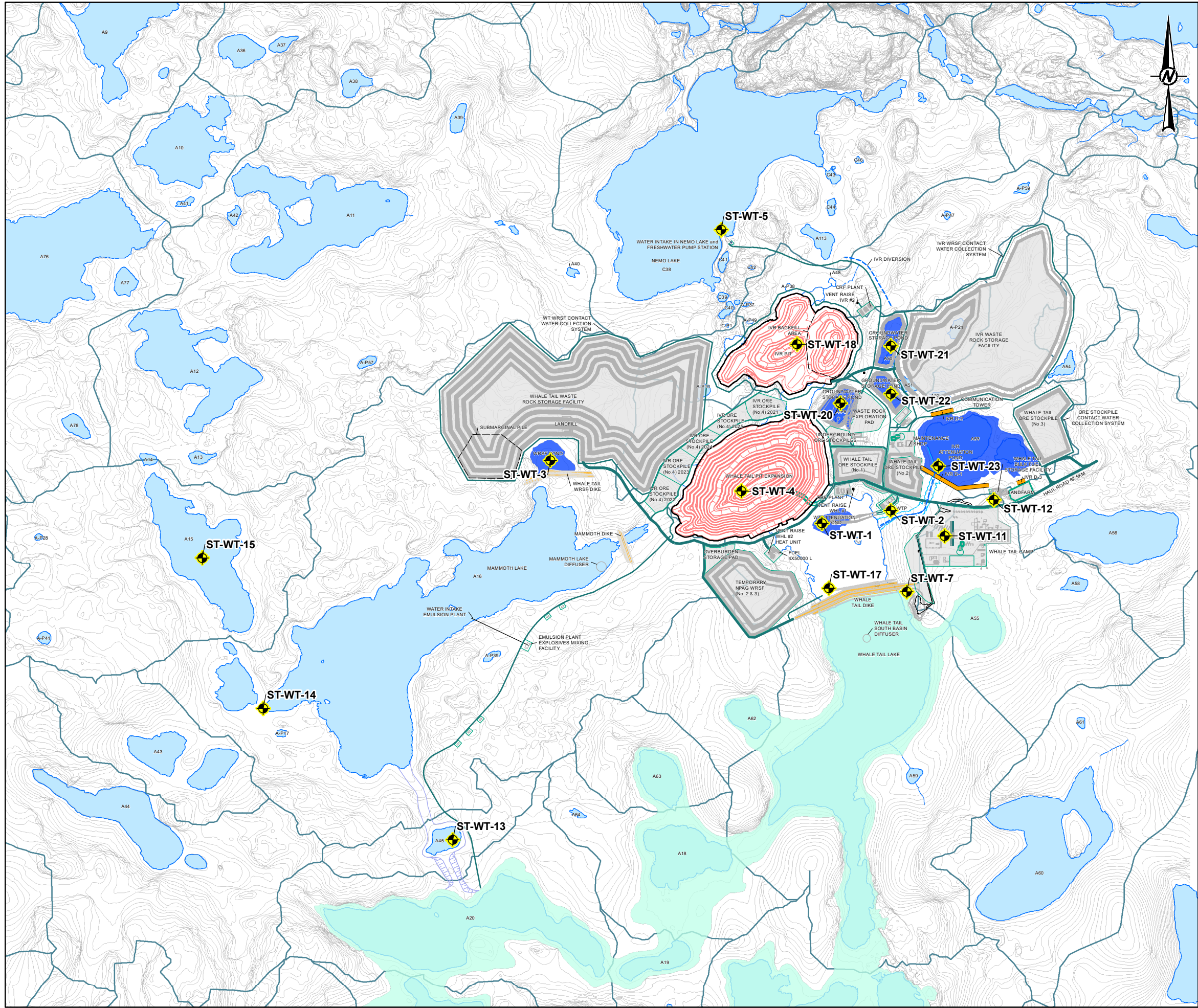
2.3 OVERVIEW OF MINE DEVELOPMENT SCHEDULE

The Expansion Project is an expansion to the Whale Tail Pit and Haul Road Project (Approved Project), a Meadowbank satellite deposit located on the Amaruq property. Agnico Eagle is proposing to expand and extend the Whale Tail Pit operations (the Expansion Project) to include a larger Whale Tail open pit, development of the IVR open pit, and underground operations while continuing to operate and process ore at the Meadowbank Mine.

The Expansion Project, mined by truck-and-shovel operation for the open pits and mainly long hole mining, will generate mine waste rock, and overburden soil with very limited organic matter (Agnico Eagle 2018b). Figures 2-1 and 2-2 show the sequence of staged development of the Expansion Project for operations phase and closure phase, respectively. The actual configuration of the pits may change as mining progresses. As a result, the monitoring program (Section 3.0) accommodates changes in the site design.

A summary of site activities and water quality monitoring issues during these phases is provided below.

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LEGEND

WATER QUALITY MONITORING STATION

WHALE TAIL WASTE ROCK STORAGE FACILITY

WHALE TAIL LAKE (SOUTH BASIN)

FLOODED LIMIT (WATER LEVEL 156.0m)

NATURAL WATERSHED

DIKE

POND/SUMP

ROAD

WATERCOURSE

WATERBODY



REFERENCE(S)

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED FROM AMQ_2025Q4V7.DWG

2. WATERCOURSE AND WATERBODY DATA OBTAINED FROM PHOTOSAT

DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 14

CLIENT

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION

PROJECT

WHALE TAIL PIT - EXPANSION PROJECT

TITLE

SITE LAYOUT AND MONITORING PLAN (OPERATIONS)

CONSULTANT	YYYY-MM-DD	2018-11-15
	DESIGNED	ER
	PREPARED	CDB
	REVIEWED	CP
	APPROVED	DF

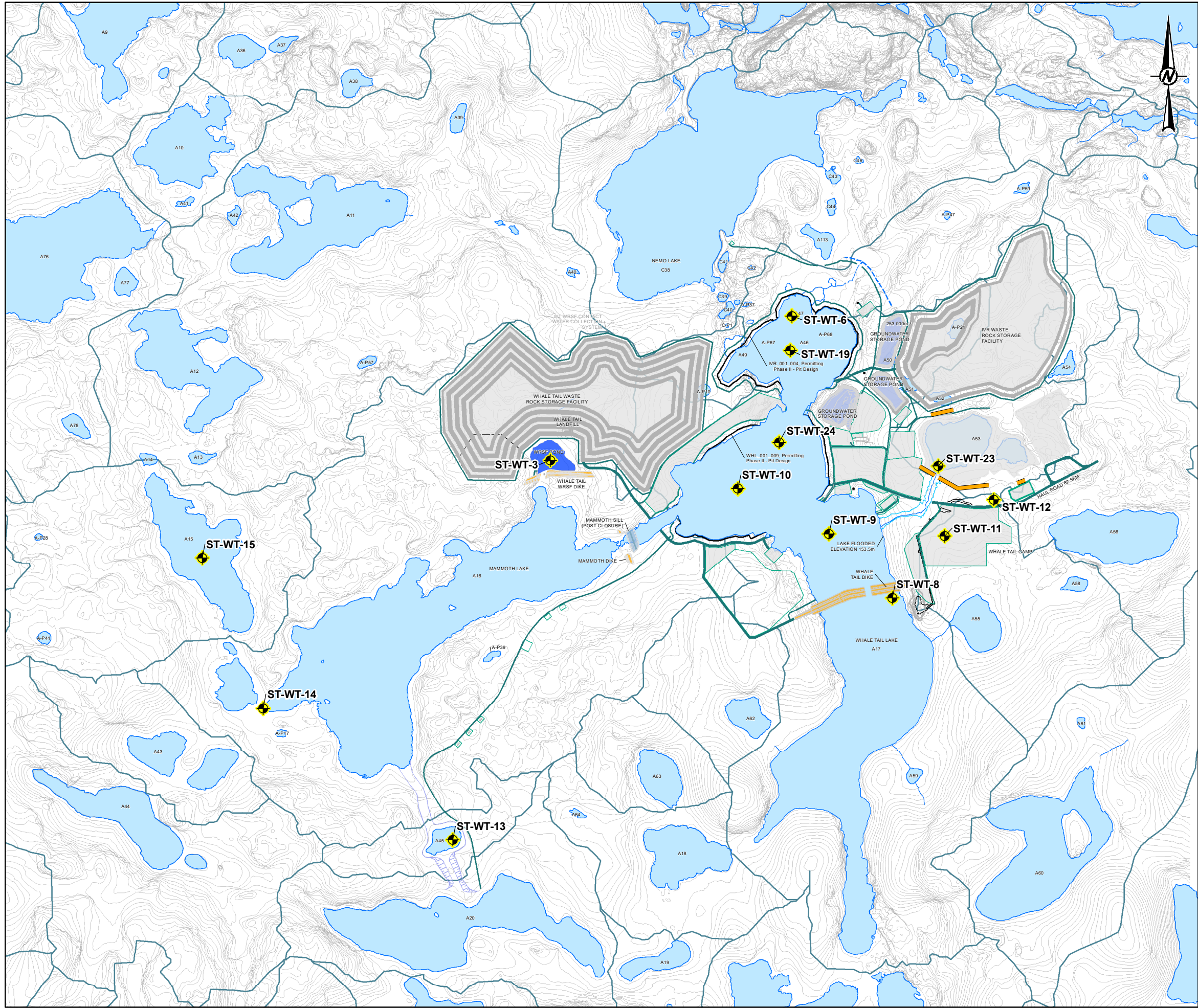


PROJECT NO.	CONTROL	REV.	FIGURE
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LEGEND

- WATER QUALITY MONITORING STATION
- WHALE TAIL WASTE ROCK STORAGE FACILITY
- WHALE TAIL LAKE (SOUTH BASIN) FLOODED LIMIT (WATER LEVEL 156.0m)
- NATURAL WATERSHED
- DIKE
- POND/SUMP
- ROAD
- WATERCOURSE

1:25,000 METRES

REFERENCE(S)

- INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED FROM AMQ_2029_AFTER_MINEV7.DWG
- WATERCOURSE AND WATERBODY DATA OBTAINED FROM PHOTOSAT

DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 14

AGNICO EAGLE

CLIENT
AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION

PROJECT
WHALE TAIL PIT - EXPANSION PROJECT

TITLE
SITE LAYOUT AND MONITORING PLAN (CLOSURE)

CONSULTANT	YYYY-MM-DD	2018-11-15
	DESIGNED	ER
	PREPARED	CDB
	REVIEWED	CP
	APPROVED	DF

PROJECT NO.	CONTROL	REV.	FIGURE
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2.3.1 Pre-development and Construction Phase

The principal impacts resulting from construction activities may be the increase in turbidity and TSS from the release of particulates during dike construction, surface runoff, the disturbance of lake sediments and the dewatering of future mining zones. Management and monitoring of these impacts are discussed in the AEMP and the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering. Construction of the Whale Tail Pit site has commenced. As an amendment to an approved and operating mine, this phase does not apply for the Whale Tail Pit expansion.

2.3.2 Operations Phase

The operations phase will span seven years, from Year 1 (2019) to Year 7 (2025).

During the operations phase, mining will occur in the open pits and underground. Most of the waste rock generated from the pit will be deposited in the WRSFs, however some NPAG waste rock may be used for construction of mine infrastructure (roads, dikes), and potentially some for fish habitat structures. Milling and tailings will be regulated under the 2AM-MEA1526 Type A Water Licence. During the operations phase, surface contact water (WRSFs, WRSF ponds, pits, dike seepage, sewage) will be directed to the Attenuation Ponds for storage, prior to treatment. Contact water from underground operations will be stored in Groundwater Storage Ponds prior to treatment and blending with the treated surface water. Treated water will be discharged to the receiving environment (Mammoth Lake – 2019 to May 2021; Whale Tail Lake [South Basin] – June 2021 to 2025).

Details of water movement and the water balance are provided in the Whale Tail Pit - Water Management Plan developed for the Expansion Project.

2.3.3 Closure Phase

After the completion of mining, the closure phase will span from Year 8 (2026) to Year 24 (2042) and will include removal of the non-essential site infrastructure and flooding of the mined-out open pits and underground, and re-establishment of the Whale Tail Lake water level 1 m higher than under baseline conditions.

The Dikes will be decommissioned once water quality within the pit lake meets discharge criteria. Activities during the late closure phase will be primarily monitoring of selected mine facilities including flooded pit lakes and the reclaimed WRSFs areas.

Further details about closure is covered in the Interim Whale Tail Closure and Reclamation Plan (2019).

2.3.4 Post-closure Phase

Post-closure and monitoring phases will commence after closure is completed in Year 24 (2042) and will continue until it is shown that the site and water quality meet regulatory closure objectives. Post-closure monitoring to confirm physical and chemical stability, if required.

SECTION 3. MONITORING PROGRAM

The monitoring program is presented in three sections; requirements of the compliance monitoring (CM) program, an overview of the event monitoring program (i.e., monitoring that occurs after spills or emergencies), and details of the adaptive management program for monitoring results.

3.1 COMPLIANCE MONITORING PROGRAM

The CM program monitors the chemistry of mine contact water and diverted water at specified locations prior to the release into the receiving water environment in order to confirm and document compliance with regulatory requirements. The types of water and the timing of the CM program include:

- non-contact water discharged from diversion ditches during operations, and closure phases of the mine and eventually non-contact water from dike seepage;
- mine contact water directed to and discharged from the Attenuation Ponds during the operations phase of the mine;
- monitoring points located within the pit lakes and the flooded Whale Tail Attenuation Pond before and after the dikes have been breached during the late-closure phase of the mine life; and
- IVR WRSF Contact Water Collection System to the IVR Attenuation Pond prior to discharge to Whale Tail (South Basin); and
- runoff from Whale Tail WRSF prior to discharge to Mammoth Lake.

The CM sampling program has multiple monitoring stations across the project site, with sampling at different stages of the mine life. All of the CM stations, a description of their location, parameters to be monitored and sampling frequency are listed in Table 3-1. Specific details for the monitoring parameter groups are provided in Table 3-2 and are the same as presented in 2AM-WTP1826 Water License. In summary, 6 groups of parameters include:

- Group 1 – mine site monitoring parameters;
- Group 2 – receiving environment parameters consistent with the CREMP and applied to all AEMP stations (including ground water monitoring); includes dissolved metals for hydrogeological monitoring and to be protective of the aquatic environment;
- Group 3 – sampling prior to discharge; includes MDMER parameters plus sulphate, turbidity and Aluminum;
- Group 4 – sampling prior to discharge at secondary containment fuel storage areas;
- Group 5 – MDMER; and
- Group 6 – Field Measurements

Figures 2-1 and 2-2 show the approximate location of the sampling sites at the Whale Tail Pit area. The actual location of each sampling site is determined by access and safety considerations and will be marked by a stake (where appropriate) that defines the exact location of the collection point for sampling events with appropriate attached signage in English, Inuktitut, and French.

GPS coordinates for all compliance monitoring stations will be confirmed with the Water Resources Officer.

Table 3-1: Monitoring Program

Station	Description	Phase	Monitoring Parameters or Group	Frequency
ST-DC-1 to TBD	Monitoring stations during dike construction as defined in the Whale Tail Water Quality Monitoring and Management Plan for Dike Construction and Dewatering	Construction	As defined in Water Quality Monitoring and Management Plan for Dike Construction and Dewatering referred to in Part D, Item 5	As defined in Water Quality Monitoring and Management Plan for Dike Construction and Dewatering referred to in Part D, Item 5
ST-DD-1 to TBD	Monitoring Program stations during dike dewatering as defined in the Whale Tail Water Quality Monitoring and Management Plan for Dike Construction and Dewatering	Construction	As defined in Water Quality Monitoring and Management Plan for Dike Construction and Dewatering referred to in Part D, Item 5	As defined in Final Water Quality Monitoring and Management Plan for Dike Construction and Dewatering referred to in Part D, Item 5
ST-S-1 to TBD	Seeps (to be determined)	Operations	Group 1	Monthly or as found
		Closure	Group 1	Monthly or as found
ST-GW-1 to TBD	Groundwater wells (to be determined) as required under Groundwater Monitoring Plan	Operations	Group 2	Annually
		Closure	Group 2	Annually
ST-WT-1	Attenuation Pond, pre-treatment	Operations	Group 1	Four times per calendar year
ST-WT-2	Attenuation Pond, post treatment; last point of control before discharge	Operations	Volume (m ³)	Daily during periods of discharge
			Field Measurements	Weekly during periods of discharge
			Group 2	Weekly during periods of discharge
			Group1-MDMER Effluent characterization	Four times per calendar year
			Group 3-MDMER Acute Toxicity	Once prior to discharge and Monthly thereafter
			3-MDMER sub-lethal toxicity	Two times per calendar year
ST-WT-3	Waste Rock Storage Facility (WRSF) Pond prior to pumping to Attenuation Pond	Operations	Group 1	Four times per calendar year, when water is present.
		Closure	Group 1	Four times per calendar year, when water is present.
	Waste Rock Storage Facility (WRSF) Pond prior to discharge to Mammoth Lake	Post-closure	Group 1	Four times per calendar year, when water is present.
ST-WT-4	Whale Tail Pit or pit sump	Operations	Group 1	Four times per calendar year
ST-WT-5	Water intake from Nemo Lake	Construction	Volume (m ³)	Monthly
		Operations	Volume (m ³)	Monthly
ST-WT-6	Lake A47	Construction	Group 2	Monthly during open-water
		Operations	Group 2	Monthly during open-water
		Closure	Group 2	Monthly during open-water
ST-WT-7	East diversion channel	Operations	Group 3	Three times (freshet, summer, fall) per calendar year
ST-WT-8	Water intake from Whale Tail Lake	Closure	Volume (m ³)	Monthly

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Station	Description	Phase	Monitoring Parameters or Group	Frequency
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	Group 1	Four times per calendar year
		Post-closure	Group 2	Four times per calendar year
ST-WT-10	Pit Lake (as the pit fills)	Closure	Group 2	Four times per calendar year
		Post-closure	Group 2	Four times per calendar year
ST-WT-11	Sewage treatment plant	Operations	Group 1	Four times per calendar year
		Closure	Group 1	Four times per calendar year
ST-WT-12	Secondary containment at Whale Tail Bulk Fuel Storage Facility	Operations	Group 4	Prior to discharge or transfer of effluent
		Closure	Group 4	Prior to discharge or transfer of effluent
ST-WT-13	Lake A45	Operations	Group 3	Flow, Monthly during open-water
		Closure	Group 3	Flow, Monthly during open-water until water level have returned to baseline level
ST-WT-14	Lake A16 outlet	Construction	Group 2	Monthly during open-water
		Operations	Group 2	Monthly during open-water
		Closure	Group 2	Monthly during open-water
ST-WT-15	Lake A15	Construction	Group 2	Monthly during open-water
		Operations	Group 2	Monthly during open-water
		Closure	Group 2	Monthly during open-water
ST-WT-17	Whale Tail Dike Seepage	Operation	Group 1	Monthly during discharge
ST-WT-18*	IVR Pit or sump	Operations	Group 1	Four times per calendar year
ST-WT-19*	IVR Pit Lake	Closure	Group 2	Four times per calendar year
		Post-closure	Group 2	Four times per calendar year
ST-WT-20*	Groundwater Storage Pond 1	Operations	Group 1	Four times per calendar year
ST-WT-21*	Groundwater Storage Pond 2	Operations	Group 1	Four times per calendar year
ST-WT-22*	Groundwater Storage Pond 3	Operations	Group 1	Four times per calendar year
ST-WT-23*	IVR Attenuation Pond	Operations	Group 1	Four times per calendar year
		Closure	Group 1	Four times per calendar year
ST-WT-24*	Whale Tail Pit Lake (North Wall)	Closure	Group 2	Four times per calendar year
		Post-closure	Group 2	Four times per calendar year

* New monitoring station proposed in support of the Expansion Project.

Table 3-2: Monitoring Parameters

Group	Parameters
1	pH, turbidity, hardness, alkalinity, chloride, fluoride, sulphate, total dissolved solids (TDS), total suspended solids (TSS), ammonia nitrogen, nitrite, nitrate, orthophosphate, total phosphorus, total metals (aluminum, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, thallium and zinc).
2	<p>Total and Dissolved metals: aluminum, antimony, arsenic, boron, barium, beryllium, cadmium, copper, chromium, iron, lithium, manganese, mercury, molybdenum, nickel, lead, selenium, tin, strontium, titanium, thallium, uranium, vanadium and zinc.</p> <p>Nutrients: Ammonia-nitrogen, total Kjeldahl nitrogen, nitrate nitrogen, nitrite-nitrogen, orthophosphate, total phosphorous, total organic carbon, total dissolved organic carbon and reactive silica.</p> <p>Conventional Parameters: bicarbonate alkalinity, chloride, carbonate alkalinity, conductivity, hardness, calcium, potassium, magnesium, sodium, sulphate, pH, total alkalinity, TDS, TSS and turbidity.</p>
3	MDMER parameters (arsenic, copper, lead, nickel, zinc, TSS, pH), sulphate, turbidity and total aluminum.
4	Total Arsenic, Total Copper, Total Lead, Total Nickel, TSS, Benzene, Toluene, Ethylbenzene, Xylene, TPH, pH.
MDMER	Arsenic, copper, lead, nickel, zinc, TSS, pH, effluent volumes and flow rate of discharge, acute lethality (Rainbow Trout and <i>Daphnia magna</i>) and environmental effects monitoring (EEM).
Field Measurements	pH, specific conductivity, dissolved oxygen (DO) and temperature

3.1.1 General Sampling and Analysis Program

Samples are collected in clean laboratory-supplied containers and preserved as directed by the analytical laboratory. During all phases, samples are analyzed offsite at an accredited commercial lab (e.g., ALS in Burnaby BC, Maxxam Analytics in Montreal or H2lab in Val d'Or).

Table 3-3 summarizes the minimum sample volumes, container, preservation, and holding times for each analyze. This information is from the *USEPA Methods for Chemical Analysis of Water and Waste Water (EPA-600/4-79-020, 1979)*. Note, these bottle types and volumes may change if the laboratories make a change in procedure.

Table 3-3: Summary of Sampling Requirements for each Analyte

Parameter	Minimum Volume (mL)	Bottle Type	Preservation	Holding Time
pH	250	250 mL, glass or plastic, filled to the top	4°C	Analyze immediately
Conductivity	125	250 mL, glass or plastic	4°C	28 days
Hardness	250	250 mL plastic, filled to the top	4°C, HNO ₃	6 months
Oil and Grease (total)	1000	1 L amber glass	4°C, H ₂ SO ₄	28 days
Turbidity	125	250 mL, glass or plastic	4°C	48 hours
Total Dissolved Solids (TDS)	125	250 mL glass	4°C	7 days
Total Suspended Solids (TSS)	125	250 mL glass	4°C	7 days
Total Alkalinity	250	250 mL, glass or plastic, filled to the top	4°C	14 days
Bicarbonate Alkalinity	250	250 mL, glass or plastic, filled to the top	4°C	14 days
Carbonate Alkalinity	250	250 mL, glass or plastic, filled to the top	4°C	14 days
Total Cyanide	125	250 mL, glass or plastic	4°C, NaOH	14 days
Free Cyanide	125	250 mL, glass or plastic	4°C, NaOH	14 days
Benzene, Toluene, Ethylbenzene & Xylene (BTEX)	40 (per vial)	3 X 40 mL, glass, filled to the top	4°C	7 days
Total Petroleum Hydrocarbons(TPH)	1000	1L, glass	4°C, H ₂ SO ₄	28 days
<u>Total Metals (ICP-MS)</u> (Aluminum, Antimony, Arsenic, Boron, Barium, Beryllium, Cadmium, Cobalt, Copper, Chromium, Iron, Lithium, Manganese, Mercury, Molybdenum, Nickel, Lead, Selenium, Tin, Strontium, Titanium, Thallium, Uranium, Vanadium, Zinc, Potassium, Magnesium, Sodium)	125	250 mL plastic	4°C, HNO ₃	6 months
<u>Dissolved Metals</u> (Aluminum, Antimony, Arsenic, Boron, Barium, Beryllium, Cadmium, Cobalt, Copper, Chromium, Iron, Lithium, Manganese, Mercury, Molybdenum, Nickel, Lead, Selenium, Tin, Strontium, Titanium, Thallium, Uranium, Vanadium, Zinc)	125	250 mL plastic	4°C, Filtered on-site, HNO ₃	6 months
Ammonia-nitrogen	250	250 mL, glass or plastic, filled to the top	4°C, H ₂ SO ₄	28 days
Total kjeldahl nitrogen	250	250 mL, glass or plastic, filled to the top	4°C, H ₂ SO ₄	28 days
Nitrate nitrogen	125	250 mL, glass or plastic	4°C	48 hours
Nitrite nitrogen	125	250 mL, glass or plastic	4°C	48 hours
Ortho-phosphate	125	250 mL, glass or plastic	4°C	14 days
Total phosphorous	125	250 mL, glass or plastic	4°C, H ₂ SO ₄	28 days
Total organic carbon	125	250 mL glass	4°C, H ₂ SO ₄	28 days
Dissolved organic carbon	125	250 mL glass	4°C, H ₂ SO ₄	28 days
Chloride	125	250 mL, glass or plastic	4°C	28 days
Fluoride	125	250 mL plastic	4°C	28 days
Sulphate	125	250 mL, glass or plastic	4°C	28 days
Radium 226	500	1L plastic	4°C, HNO ₃	1 month
Reactive Silica	250	500 mL, plastic	4°C	28 days

Note: The bottle types and preservation method may change at the discretion of the laboratory.

3.1.2 Compliance Monitoring Stations and Discharge Criteria

Consistent with similar mining operation (i.e., Meadowbank Mine) further details of the specific CM stations and discharge criteria are established for Whale Tail Pit Project according to the Nunavut Water Board Type A Water Licence 2AM-WTP1826.

3.1.2.1 Construction and Dewatering Activities

To mine the Whale Tail Pit, a series of dikes will be built to isolate the pit from the surrounding water bodies. The document “*Whale Tail Pit Project Water Quality Monitoring and Management Plan for Dike Construction and Dewatering*” (January 2016) will be followed for the Approved Project to specifically address the monitoring requirements for these activities (Refer to Section 3 of that plan).

To mine the IVR Pit, the IVR Diversion will be built to isolate the pit from the surrounding waterbodies.

3.1.2.2 Visual Inspections and Seepage Monitoring

The Plan includes visual inspections to be conducted regularly to monitor for potential issues such as erosion (see Section 3.1.2.3 for more details), spills and leaks (see Section 3.2 for more details), or unanticipated seepage (e.g., from the WRSF, haul road). Where seepage is observed, sampling will be conducted (Table 3-1 for details) and appropriate follow-up (e.g., collection and transport to the Attenuation Ponds) will be conducted.

Regular inspections and seepage monitoring (where water is observed) is required to document that the seepage is appropriately contained, managed and will not enter the receiving environment. Inspections will be conducted on a monthly basis at the WRSFs during open water season or after a major rain event occurs. Seepages identified at the Whale Tail WRSF will be pumped to the WRSF collection pond. Seepages identified at the IVR WRSF will be captured in the IVR WRSF Contact Water Collection System and transferred to the IVR Attenuation Pond. Results of the inspections and seepage monitoring data are also used for comparisons to the FEIS predictions (see Section 5.0 for more details).

3.1.2.3 Water Collection System (Diversion and Effluent)

A water collection system comprised of ditches, sumps, water management ponds, and open pits is proposed to control surface water for the Approved and Expansion Project. Water that may potentially come into contact with waste rock or contaminated material is segregated from non-contact water and collected in water management ponds and treated, if necessary, prior to discharge into the receiving environment.

Regular monitoring during freshet (the snowmelt, thawing) and during heavy or prolonged rainfall to identify any erosional or stability issues with regards to:

- The configuration or structure of channels, due to localized thawing, local ground instabilities, subsidence and transport of fine particles;
- The free flow of water, due to an accumulation of ice, sediments and other debris; and
- Potential damage to retention structures and monitoring of seepage.

Maintenance operations consist of cleaning accumulated sediments and debris from the ditches and culverts, and repairing damaged areas as soon as possible.

During pit flooding, samples will be taken in representative locations of the pit that is being re-flooded. It is likely that the sampling sites will change based on mine sequencing and as the water level in the pits rise in response to flooding.

The following is a list of the various areas of the water collection system where samples for the internal compliance monitoring program will be collected:

- Whale Tail/IVR Pit area ditches, sumps, ponds, and pit lake (ST-WT-1, ST-WT-3, ST-WT-4, ST-WT-7, ST-WT-10, ST-WT-18, ST-WT-19).

Effluent discharged from the Attenuation Ponds at CM station ST-WT-2 is directed to the receiving environment through a diffuser. Discharge to the receiving environment shall not exceed effluent quality limits stipulated in Table 3-4 and based on criteria established in Whale Tail Pit Type A Water Licence 2AM-WTP1826.

Table 3-4: Effluent Criteria – Whale Tail Pit Expansion Project

Parameter	Maximum Average Concentration	Maximum Allowable Grab Sample Concentration
Conventional Parameters		
pH	6.0 to 9.5	6.0 to 9.5
Total Suspended Solids (mg/L)	15	30
Total Dissolved Solids (mg/L)	1400	1400
Nutrients		
Total Ammonia (mg-N/L)	16	32
T-Phosphorus (mg-P/L)	0.3	0.6
Metals		
Total Aluminium (mg/L)	0.5	1.0
Total Arsenic (mg/L)	0.1	0.2
Total Cadmium (mg/L)	0.002	0.004
Total Chromium (mg/L)	0.02	0.04
Total Copper (mg/L)	0.1	0.2
Total Iron (mg/L)	1.0	2.0
Total Lead (mg/L)	0.05	0.10
Total Mercury (mg/L)	0.004	0.008
Total Nickel (mg/L)	0.25	0.5
Total Zinc (mg/L)	0.1	0.2
Other		
Total Petroleum Hydrocarbons (mg/L)	3.0	6.0

Effluent discharged from CM station ST-WT-2 shall be demonstrated to be acutely non-lethal, as stipulated in Water Licence 2AM-WTP1826 Modified Schedule 1. The following are the toxicity tests that are performed:

- Reference Method for Determining Acute lethality of Effluents to Rainbow Trout EPS 1/RM/13 Second Edition December 2000 (with May 2007 amendments); and
- Biological Test Method; Acute Lethality Test Using Daphnia spp. EPS 1/RM/11 July 1990 (with May 1996 amendments).

All water collected within the non-contact water diversion system during operations at CM stations ST-WT-7, ST-WT-13 and Whale Tail Seepage Monitoring Program Stations ST-S-1 to –TBB shall not exceed the effluent quality limits presented in Table 3-5.

Table 3-5: TSS Criteria at CM Stations ST-WT-7 and ST-WT-13

Parameter	Maximum Average Concentration (mg/L)	Maximum Allowable Grab Sample Concentration (mg/L)
TSS	15	30

3.1.2.4 Waste Rock Storage Facility

Waste rock from the open pits not used for site development purposes will be trucked to the Whale Tail or IVR WRSFs. Samples will be collected at the WRSF Ponds [ST-WT-3 and ST-WT-23], the contact water collection system surrounding the WRSFs (if required), and if seepage is observed, for the compliance monitoring program. Frequency of collection will be as described in Table 3-1.

In addition, there will be regular inspections of the WRSFs to determine the presence of any seepage or uncontrolled runoff. Where seepage or runoff is observed, water quality samples will be collected and facilities will be constructed to divert water to a collection system. Results of these inspections are reported in the Agnico Eagle annual report.

Further details about waste rock monitoring is covered in the Acid Rock Drainage/Metal Leaching Plan.

3.1.2.5 Support Facilities

Whale Tail Pit Camp and Site

A sewage treatment plant will be in operation at the Whale Tail Camp. Discharge from the plant will be directed to the attenuation pond(s) and then discharged through a diffuser to the receiving environment. Water quality monitoring for this facility is included in the CM water collection system.

Construction debris and domestic waste generated on-site to be disposed of to the on-site landfill located in the Whale Tail WRSF.

The Whale Tail Bulk Fuel Storage Facility will be located east of the Whale Tail Camp adjacent to the mine operations haul road. Water collected within the fuel containment facilities will be discharged to land, when necessary, in a controlled manner. It is proposed that Effluent from the fuel containment facilities being discharged to land (sampled as ST-WT-12) shall not exceed the effluent quality limits presented, as stipulated in the Whale Tail Type A Water Licence 2AM-WTP1826 (Table 3-6).

Table 3-6: Effluent Criteria – Whale Tail Bulk Fuel Storage Facility at Monitoring Station ST-WT-12

Parameter	Maximum Authorized Monthly Mean Concentration	Maximum Authorized Concentration in a Grab sample
Conventional Parameters		
pH	6.0 to 9.5	6.0 to 9.5
Total Suspended Solids (mg/L)	15*	30
Metals		
Total Arsenic (mg/L)	0.5*	1.0
Total Copper (mg/L)	0.3*	0.6
Total Nickel (mg/L)	0.5*	1.0
Total Zinc (mg/L)	0.5*	1.0
Lead (mg/L)	0.1	0.1
Other		
Oil and Grease (mg/L)	5 and no visible sheen	5 and no visible sheen
Ammonia (mg/L)	6.0	6.0
Benzene (µg/L)	370	370
Toluene (µg/L)	2	2
Ethylbenzene (µg/L)	90	90

*Metal and Diamond Mines Effluent Regulations (MDMER)

3.1.2.6 Whale Tail Pit Haul Road and Quarries

Whale Tail Pit Haul Road and Quarries

The 64.1 km long haul road from Vault to the Whale Tail Pit Project site will be expanded in width (from 9.5 m to 15 m). The expanded road will be constructed using waste rock or aggregates from the quarry sites and esker, and top-dressed with esker material already permitted and leased, as well as four new quarries.

Monitoring procedures along the Whale Tail Pit Haul Road and quarries include visual inspections of infrastructure and water quality sampling.

As per the quarry leases requirements (Item 17 of Quarry Permit KVCA15Q02, Item 17 of Quarry Permit KVCA15Q01, Item 18 of Quarry Permit KVCA17Q01 and Item 18 of Quarry Permit KVCA18Q01), a water monitoring plan will be prepared for quarries in which explosives are in use. The water will be monthly sampled and analyzed for a full suite of water quality parameters¹. Prior to the tenth day of each month, a report will be submitted to the KIA indicating the water quality results. Water results shall be tabulated and compared to applicable guidelines.

¹ Physical Parameters: pH (field and laboratory), temperature (field), alkalinity, bicarbonate, carbonate, electrical conductivity, hardness, hydroxide, ion balance, total dissolved solids, total suspended sediments

Nutrients: NH₄, NO₃, NO₂, PO₄

Major Ions: Ca, Cl, Mg, K, Na, SO₄

Trace Metals: Al, Sb, As, Ba, Be, B, Cd, Cr, Cu, Fe, Pb, Li, Mn, Hg, Mo, Ni, Se, Ag, Sr, Sn, Ti, U, V, Zn

Visual Inspections

The watercourse crossing visual inspection and maintenance program is designed to identify issues relating to watercourse crossings structural integrity and hydraulic function. It has two main objectives:

- 1) Visual inspection of its infrastructure to identify defects, cracks or any other risks to structural integrity. Particular attention will be paid to the inlet and outlet structures of culverts, and to bridge abutments and their foundations, as required. This inspection is conducted annually by a geotechnical engineer.
- 2) Visual inspection to identify sediment or other debris accumulation impeding the free flow of water through the crossings. Maintenance operations will consist of hand removal of accumulated debris and repairing damages as soon as possible. Visual inspection of upstream and downstream channels to identify bed erosion or scour around the watercourse crossing structure. Particular attention is to be paid to bridge abutments and abutment foundations as they are vulnerable to scour and erosion. This inspection is conducted weekly during freshet and post freshet season, by a member of the environmental team.

Results of these inspections are reported in the Agnico Eagle annual report.

Water Quality Monitoring

Geochemical characterization studies were carried out in 2015 to 2018 on esker and quarries material from potential borrow source locations between Vault and Whale Tail Pit, as well as NPAG waste rock from the Vault WRSF. The results indicate that the materials tested are suitable for construction use and are not expected to cause any adverse water quality issues.

If issues are observed or a spill occurred near a water course during the winter a full suite of water quality sampling is conducted along the Whale Tail Pit Haul Road at areas of concern. This includes:

- Any significant water seeps and/or water ponded in contact with the road. Other criteria for selecting a sampling location include: areas of evident rock staining (rust color particularly) and areas where an accidental spill has previously occurred.
- Upstream and downstream from the major road stream crossings in order to confirm there are no water quality issues resulting from these crossings or the adjacent road rock fill.

Should the results indicate a significant change in water quality from previous years or elevated risks to aquatic life, further water quality monitoring will be conducted at those specific locations to determine the cause and notification will be provided to regulatory authorities. An action plan will be developed and implemented should the results indicate issues. The results for all access road water quality monitoring are reported in the Agnico Eagle Annual Report to regulators.

3.1.2.7 Groundwater

The *Groundwater Monitoring Plan* describes the groundwater monitoring plan for the Approved and Expansion Project.

3.1.2.8 Receiving Environment

Receiving water quality monitoring is discussed in Section 1A of the *Aquatic Effects Management Program (AEMP)* (November 2015). Within the AEMP are numerous monitoring programs: of greatest emphasis for the protection of the aquatic environment are the core receiving environment monitoring program (CREMP), Environmental Effects Monitoring studies and targeted monitoring programs (Azimuth 2015, 2016, 2018a, 2018b).

The core monitoring program includes three areas of sampling stations that surround each of the mine developments (near field, mid field and far field) for early detection of mine-related impacts, as well as two reference lake areas. The monitoring program is summarized in Table 2-2 of the CREMP and includes: water quality, sediment chemistry, benthos, periphyton, phytoplankton, and fish monitoring (as part of EEM and fish habitat compensation monitoring), the parameters to be measured, sampling locations, sampling frequency, sampling methods, and criteria for data evaluation. Targeted studies are limited in scope and intended to address “specific questions related to particular components of mine development during construction and operation.”

Monitoring locations for the effluent diffuser in the receiving environment will be located at the edge of the diffuser mixing zone either within the CREMP core near-field sampling zones or as separate monitoring locations, depending upon the final location of the diffuser.

Lakes not sampled under the CREMP (ST-WT-13 and ST-WT-15) are included in this monitoring plan and are listed in Table 3-1. Data collected from these sampling stations during the operations phase will be compared to the water quality model predictions.

3.2 EVENT MONITORING

The Event Monitoring (EM) program addresses the site-specific monitoring that is required following any accidental release. A “release” may be caused by:

- Spills, including unidentified seepage (Spill Contingency Plan); and
- Emergencies (Emergency Response Plan).

The EM program is designed to verify whether contamination of the surface soil, nearby receiving environment and active zone has occurred as a result of an accidental release of a hazardous material or contaminated water, through monitoring of surface runoff and nearby receiving environment following remediation of any release. It is anticipated that owing to the presence of permafrost beneath most of the mine footprint, there will be minimum impact to groundwater. A complete list of hazardous materials use during operations of the mine is provided in the *Hazardous Materials Management Plan*.

The EM plan is developed on a site-specific basis subsequent to a spill or other incident, and considers the type of product spilled, the potential receptors and the potential for any remaining contamination after clean-up. The plan is done in coordination with the Environmental Superintendent as described in the *Spill Contingency Plan*.

In the event of an accidental release, the water quality of the downstream receptor and possibly upstream of the receiving point, if any, is to be sampled (during the ice-free season) and analyzed. Should the spill have happened over snow cover, water and possibly soil sampling is to take place at the earliest feasible time after thaw to verify if there has been any impact to the receiving water

or soil quality. The specific parameters monitored as part of the EM program will depend on the nature of the spill, and will be determined for the specific hazardous material released.

EM monitoring will occur following the clean-up of a release and the frequency of sampling will depend on the type of material spilled (wet or dry spill), the environment into which the chemical was released (surface water body or soil; frozen or thawed), the quantity of spill material and the status of remediation/clean up measures that were initiated. The EM program for a particular spill will cease upon obtaining satisfactory analytical results (within 20% of background level, to accommodate for analytical accuracy) from the potentially affected areas or as required by regulators.

3.3 ADAPTIVE MANAGEMENT PROGRAM

Results of the water quality monitoring are to be reviewed by the Environmental Department of the mine and chemical trends of constituents of interest are tracked for mine site monitoring and in the AEMP data (including the CREMP) to allow early detection of significant changes in water quality within the mine site prior to discharge, or if thresholds and triggers are exceeded in the receiving environment. Action plans are then to be implemented to ensure that environmental protection objectives are met.

Results of the annual monitoring are compared to the FEIS water quality predictions to determine if conditions are similar to predicted. If site data shows a negative trend that differs from predicted concentrations by a significant amount, the adaptive management program designed for the Project provides a framework for action, if necessary. This program is consistent with the program in use at the Meadowbank Mine. The program has two levels - a trigger level to compare the monitoring data, and an action plan of mitigative measures for identified exceedances to these triggers.

The adaptive management program is divided into two sections, one for parameters with regulated discharge criteria at specific monitoring locations, as specified in the Water Licence 2AM-WTP1826 and by the MDMER. The second section is for measured parameters for which no discharge limits have been identified in the water Licence (i.e. CREMP monitoring).

3.3.1 Adaptive Management Program for Regulated Discharge

3.3.1.1 Action Plan

In the case of an exceedance of a NWB Licence limit or MDMER discharge limit an action plan will be implemented. The adaptive management program requires that if one or more of the key monitored parameters exceed the respective limits, a staged sequence of responses will follow. Table 3-7 summarizes the staged adaptive action plan for the CM program for regulated discharge. Figure 3-1 is a logic diagram showing the decision path for evaluating analytical results for regulated discharge.

Should the TSS value (measured value or calculated from turbidity measurements) of non-contact water at any time during the construction, operation, or closure phases exceed regulatory guidelines, the water will be discharged to the Attenuation Pond until the cause of the exceedance can be identified and the situation rectified.

In addition to the mitigative measures listed above, a number of other possible alternatives are

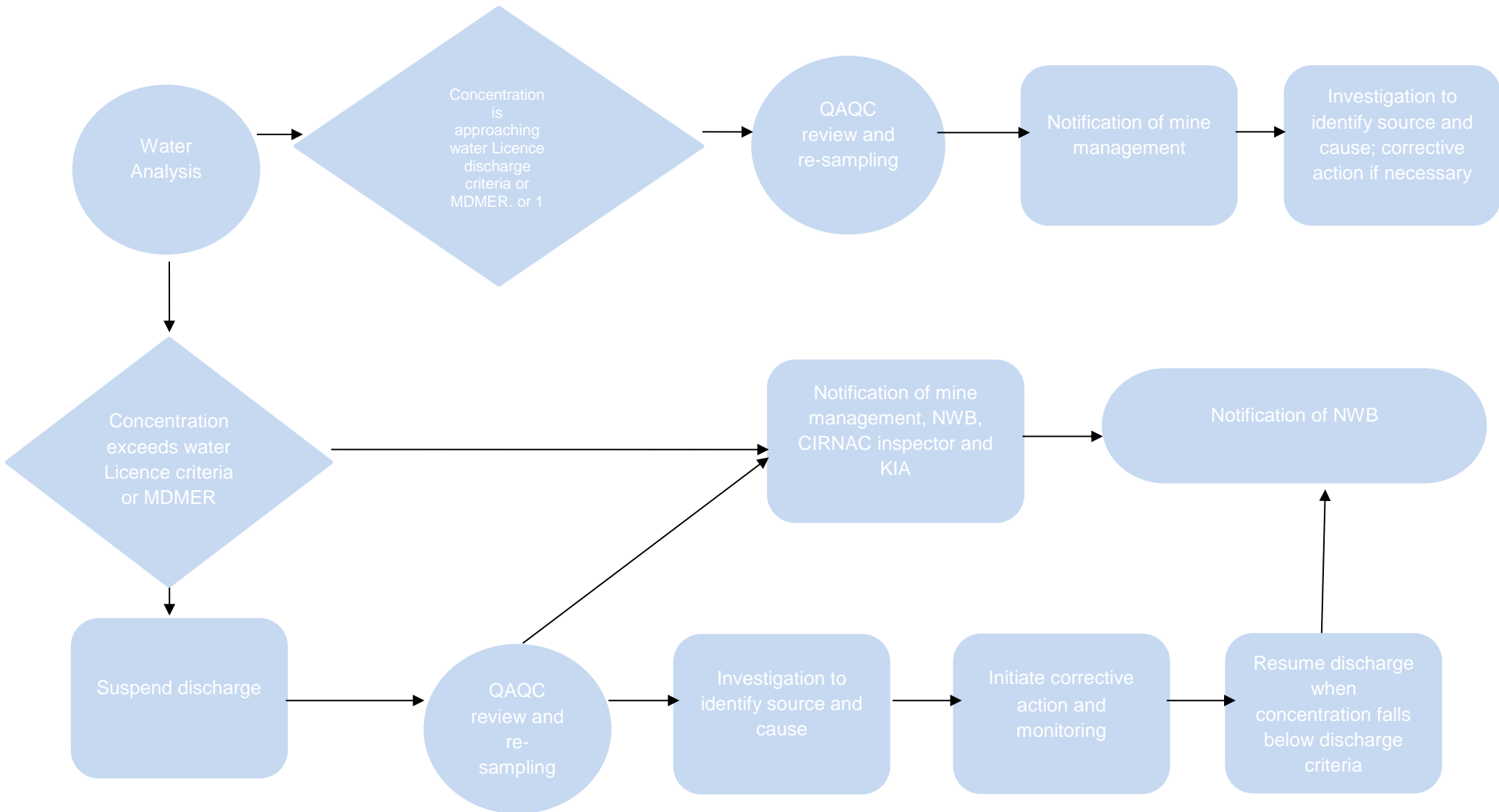
available to reduce or treat contaminants. These mitigation measures include:

- Best management practices for sediment and erosion control would be employed to reduce TSS concentrations, i.e. flow control, sedimentation basin construction, etc.;
- Addition of a coagulant for the reduction of TSS in pond water;
- Use of geotextile or re-armoring of banks to filter and reduce TSS in pond/ditch water;
- Deployment of absorbent booms and/or barriers within ponds to isolate surface petroleum hydrocarbon films for removal and/or treatment;
- Adjustments to on-site sewage treatment for the reduction of BOD and E. coli concentrations;
- Injection of oxygen or aeration for the reduction of ammonia;
- Addition of lime to increase a low pH value or reduce metal concentrations; and/or
- Removal of the offending source rock or the prevention of surface waters coming into contact with the offending source rock.
- Development and Implementation of a Whale Tail Pit-specific *Freshet Action Plan* to proactively identify any additional seeps around areas of concern; conduct additional monitoring, and control and contain seepage on site.

Table 3-7: Action Plan for Regulated Discharge

Example	Action Plan
Exceeds water Licence discharge criteria or MDMER	<ul style="list-style-type: none"> - Suspension of discharge activities; - QA/QC review and analysis, and re-sample water at the particular location if necessary; - Notification of mine management (General Mine Manager and Environment Superintendent) and the Nunavut Water Board, the CIRNAC Water Resources water Licence inspector and the Kivalliq Inuit Association; - Investigation to identify possible source(s) and cause(s) of the exceedance; - Initiation of corrective actions or water treatment, and follow up monitoring; and - Resumption of discharge when concentrations are below the discharge criteria

Figure 3-1: Logic Diagram for Regulated Discharge



3.3.2 Adaptive Management Program for Non-Regulated Discharge

Aside from targeted monitoring studies (i.e. “Effects Assessment Studies”) such as those commissioned following dike construction, the CREMP is the main program aimed at measuring and assessing potential impacts of contaminants in the receiving aquatic environment that are not regulated under MDMER or NWB.

This program was designed to take an integrated, ecosystem-based approach that links mitigation and monitoring of physical/chemical effects on key ecological receptors in the receiving environment. It addresses key issues identified in the Environment Assessment (i.e., mining-related activities with the potential to affect water quality, fish habitat and fish populations). Monitoring results are intended to inform the “adaptive management” process, supporting the early identification of potential problems and development of mitigation options to address them by comparing results to established threshold and trigger levels.

3.3.2.1 CREMP Threshold and Trigger Levels

As described in the CREMP Design Document (Azimuth 2015, 2016) trigger levels were developed to facilitate adaptive management of potential water quality issues in the receiving environment. These criteria were developed with the assumption that action will be considered before certain monitored parameters reach levels that cause or have the potential to cause adverse effects to aquatic biota. The criteria for action provide an early warning framework under which management responses may be considered, taking into account findings from other AEMP component programs. Two types of criteria were developed:

- Thresholds are legal requirements, regulatory guidelines (e.g., CCME), or other discrete benchmarks, below which unacceptable adverse effects are not expected and above which adverse effects may occur. If effects-based thresholds do not exist or are not warranted for a particular variable, then early warning triggers (based on statistical criteria) will be developed without thresholds.
- Triggers are early warning criteria that may lead to action. Exceedance of a trigger value does not necessarily imply that an adverse effect may be expected. For variables with a threshold, the trigger was set as the maximum of either the value halfway between: the baseline median and the threshold, or the 95th centile of the baseline data. For variables without thresholds, triggers were set equal to the 95th centile of the baseline data except in cases where less than 5% of the data exceeded the current detection limit (DL), in which case the trigger was set to two times the DL.

Water chemistry data is collected up to six months per year (April, May, July, August, September and November/December) for the annual period of paired sampling to support Before/After Control/Impact statistical analyses, recognizing that in any given year the actual number of samples collected may range from four to six depending on logistical constraints (e.g. snow and ice). Sampling is limited to open water months only for the reference lake stations. Two randomly located subsamples are collected at each station each month and all samples are 3 m from the surface. In addition, basic water quality data is collected at key near-field areas at least once mid-winter to reduce uncertainty regarding the potential occurrence of change over winter.

Annual average concentrations (6-month mean) are compared to trigger values to determine need for action (rather than results from individual sampling events).

Further information on the development of thresholds and triggers is provided in the CREMP Design Document (Azimuth, 2016).

3.3.2.2 Action Plan

A management response plan (MRP) has been developed for the AEMP (Azimuth 2015, 2016), of which the CREMP is one component. The general MRP for the AEMP is shown in Figure 3.2. Following the integration of the results from each independent program, the response actions are based on the cumulative results of all programs. Therefore, while we expect management actions to be taken in cases where criteria for action are exceeded, the specific actions are not linked to outcomes of the CREMP alone because the CREMP is only one of the monitoring programs under the AEMP. In other words, it is not possible or appropriate to describe the specific management actions that will be taken when CREMP triggers or thresholds are exceeded.

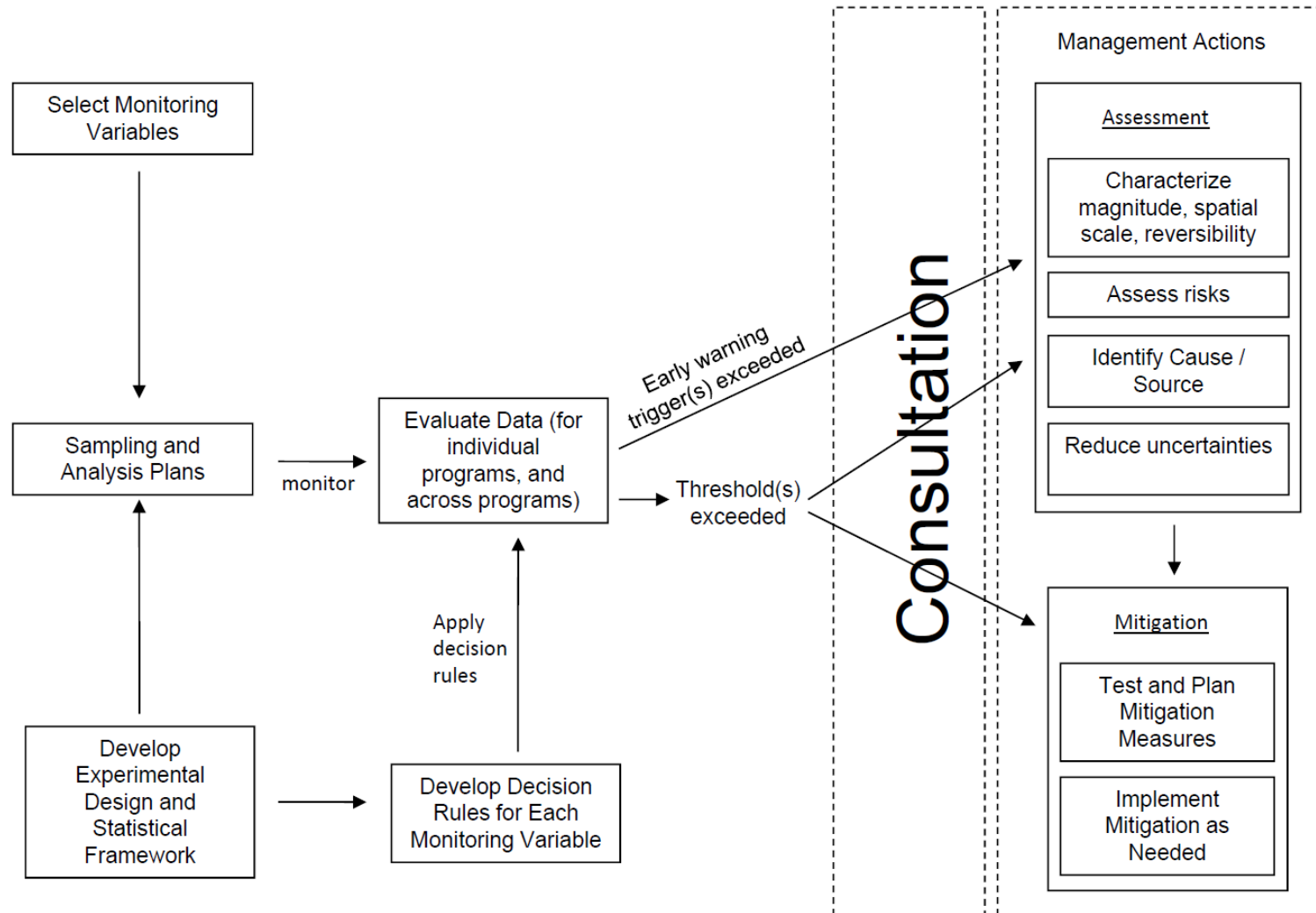
Nevertheless, there are two general classes of management actions – those aimed at further assessment and those aimed at mitigation. In general, exceedance of early warning triggers will trigger further assessment, which may then lead to mitigation, whereas exceedances of thresholds could possibly lead directly to mitigation. It is expected that CREMP triggers will be exceeded occasionally due to chance (given the large number of variables that are monitored, particularly for water chemistry), therefore further assessment will almost always be important.

The specific management action that would be appropriate in a given case depends on the underlying cause. For example, if a metal becomes elevated in receiving water, the identification of options for further assessment and/or mitigation options would be different if the source of the metal is groundwater versus effluent versus dust. The timing of management actions is also case-specific. In cases where further assessment is warranted, that assessment should begin as soon as practically possible. In cases where mitigation is considered, mitigation should begin as soon as the weight of evidence indicates that mitigation is warranted, and the benefits of commencing mitigation immediately outweigh the disadvantages of waiting for further information. Consultation with regulators and stakeholders is important for determining management actions (see Azimuth, 2015).

Further details on the integrated aquatic effects action plan are provided in Azimuth, 2015.

The general staged sequence of responses for triggered parameters is summarized in Figure 3.2 below.

Figure 3-2: Logic Diagram for Non-Regulated Discharge



SECTION 4. FLOW VOLUMES

Flow volumes within the mine footprint will be measured daily during periods of discharge. Flow volume measurements will be conducted using volumetric flow meters attached to applicable pumps. For permanent pumping arrangements, these flows will be measured using permanent in-line flow meters, such as fresh and reclaim water pumping systems. For periodic batch discharges, such as secondary containment sumps, portable flow meters or calculated pump time and capacity methods will be used. If needed, seepage collection ditch flows may be measured using either flow measuring weirs or using stream gauging methods.

Detailed pump records are maintained including date, pond/sump number, receiving location of pumped water, pump ID, duration of pumping, and total volume pumped. The average flow rates, total discharge per event and total cumulative discharge will be reported annually. The flow volumes monitoring is intended to help in the water management by ensuring the appropriate destination for contact water and discharges, and to track water conservation and recycling.

In accordance with Water Licence 2AM-WTP1826, monitoring locations of the Whale Tail Pit area for water flow volumes include:

- The volume of fresh water obtained from any source for domestic, industrial, or re-flooding (ST-WT-5);
- The volume of effluent (ST-WT-2, ST-WT-11, ST-WT-23) and fresh water (Whale Tail Lake South Basin, ST-WT-8) transferred to the pit lake; and
- The volume of water discharged from the Attenuation Ponds to a diffuser (ST-WT-2).

Details on the intervals of pumping for contact water are provided in the Water Management Plan.

SECTION 5. REPORTING

5.1 Monthly Reporting

All water quality monitoring results and flow measures will be compiled into a brief monthly report, and sent to the NWB, Crown-Indigenous and Northern Affairs Canada (CIRNAC), Water Resource Inspector and to the Kivalliq Inuit Association (KIA). These reports are due within 30 days of the end of the month being reported on.

5.2 ANNUAL REPORTING

An annual report is to be submitted to the NWB, KIA, Department of Fisheries and Oceans, CIRNAC, NIRB, Government of Nunavut, and other interested parties by March 31st of the following year. The report is to summarize the following:

- Monitoring results for each sampling station during the year and for the life of mine (construction to end of closure); activities during the year at each station; and any exceedances at stations, the action plan applied to the exceedance, and the results of the action plan;
- Annual seep water chemistry results; including location of the samples, sources of the water collected, and results of chemical analyses of the samples;
- Annual groundwater monitoring results; activities during the year at each well site and record of well operations, well replacement, and proposed drilling for the next year; and installation details of new wells and identification of any abandoned or destroyed wells.
- Receiving water monitoring results;
- Spills and any accidental releases; event monitoring activities conducted following containment, remediation, and reclamation; and the results of EM program, any exceedance in EM results, and the action plan following the exceedance;
- Compare monitoring results to predictions in the Environmental Assessment (EA) and identify significant discrepancies;
- Measured flow volumes;
- Effluent flow rates, volumes and calculated chemical loadings following the requirements of MDMER; and
- Results of QA/QC analytical data.

5.3 EXCEEDANCE REPORTING

Any measured concentration at a CM station exceeding a regulated discharge criterion stipulated in the Water Licence 2AM-WTP1826 or MDMER will be reported to the NWB and Environment and Climate Change Canada upon receipt of the analysis. In addition, results of the action plan will be reported and, where necessary, mitigation options identified within 90 days after receipt of the analyses.

Exceedances in the concentration of a parameter in receiving water will be reported as specified in the AEMP and EEM – MDMER accordingly.

SECTION 6. REFERENCES

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