



WHALE TAIL PIT

Water Quality and Flow Monitoring Plan

Prepared by:
SNC-Lavalin inc. and Agnico Eagle Mines Limited – Meadowbank Division

Version 5
October 2018

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 (Project).

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 Whale Tail Pit Project Certificate No. 008 and Type A Water License 2AM-WTP1826.

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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DOCUMENT CONTROL

| Version | Date (YMD) | Section | Page | Revision |
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| 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) |
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| 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 |

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Plan approved by:


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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) and NIRB Project Certificate No.008. This Plan is one component of the Aquatic Effects Management Program (AEMP) and is closely associated with the Water Management Report and 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 Project (Project).

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).

For the Whale Tail Project, 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 (Agnico Eagle 2018c) 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 Whale Tail Pit waste rock storage facility, open pit, 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; or
- The open pit 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 monitoring program was designed as a complimentary plan to the Core Receiving Environment Monitoring Program – Whale Tail Pit Addendum (CREMP, May 2018), the Groundwater Monitoring Plan (Agnico Eagle 2018a) and the Water Quality Monitoring and Management Plan for Dike Construction Dewatering (January 2016).

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 (FEIS, Volume 8, Appendix 8-D.6);
- Emergency Response Plan (FEIS, Volume 8, Appendix 8-D.3); and
- Whale Tail Pit Water Management Plan (July 2018).

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.

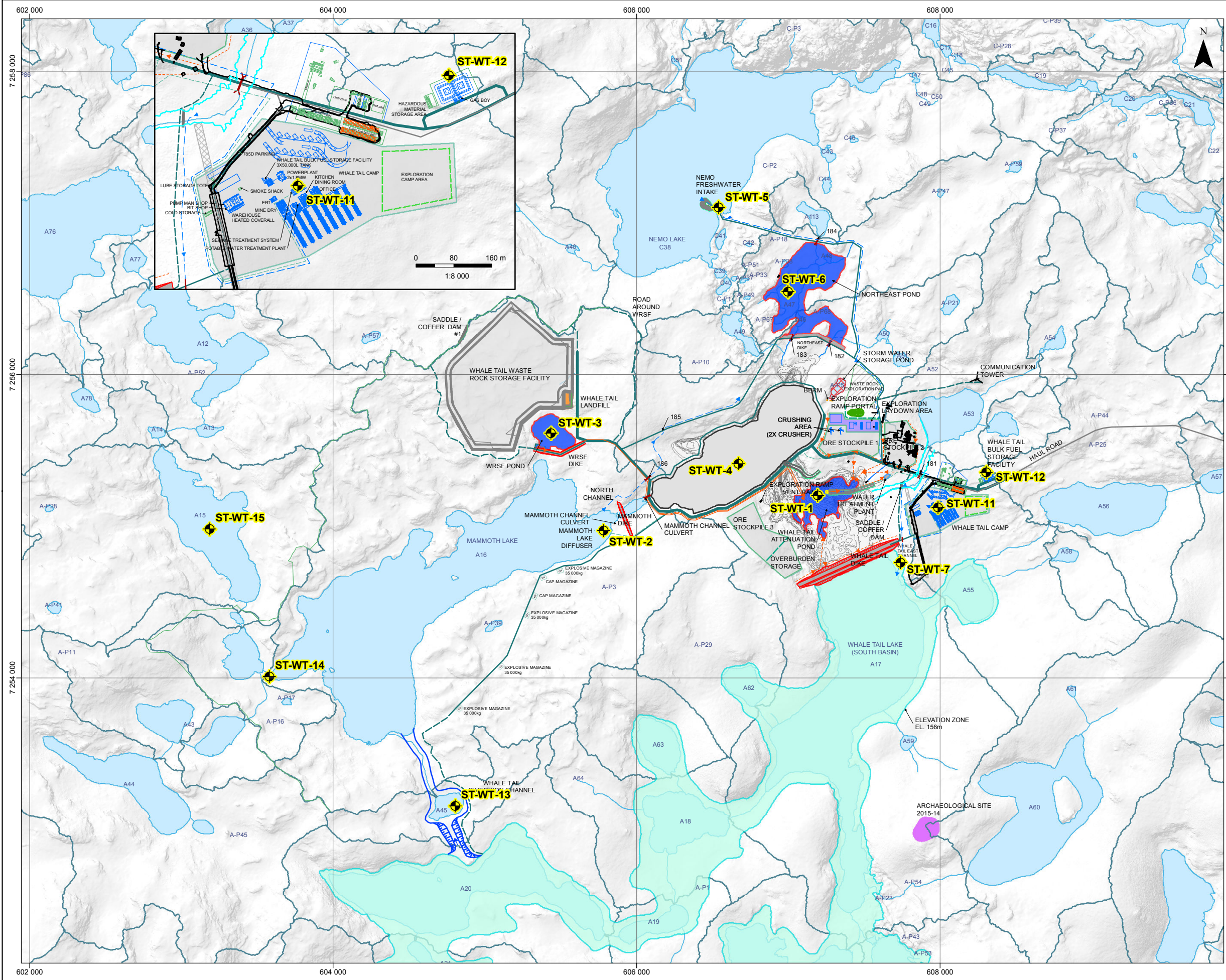
2.3 OVERVIEW OF MINE DEVELOPMENT SCHEDULE

The Project is a satellite deposit located on the Amaruq property, to extend mine operation and milling at the Meadowbank Mine. The proposed open pit mine, mined by truck-and-shovel operation, will produce 8.3 million tons (Mt) of ore, 68.2 Mt of waste rock and overburden material between 2018 and 2022. Figures 2-1, 2-2, 2-3 and 2-4 show the sequence of staged development of Whale Tail Pit, from the pre-development and construction, operations, closure, and post-closure phases, respectively. These figures show the water quality monitoring location by mine phase. The actual configuration of the pit may change as mining progresses. As a result, the monitoring program (Section 3.0) accommodates changes in the pit design.


The staged development of the mine facilities has been divided into four phases for monitoring purposes. The four phases include:

- Construction phase (illustrated on Figure 2-1);
- Operations phase (illustrated on Figure 2-2);
- Closure phase (illustrated on Figure 2-3); and
- Post-closure phase (illustrated on Figure 2-4).














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






MONITORING PLAN


 Water quality monitoring station


PROJECT COMPONENTS

-  Road
-  Temporary road
-  Diversion channel
-  Collection channel
-  Culvert
-  Intake water pipe
-  Contact water pipe
-  Freshwater pipe
-  Dike
-  Open pit
-  Final Whale Tail Waste Rock Storage Facility
-  Whale Tail Lake (South basin) flooded limit (water level 156.0 m)
-  Pond/sump

HYDROGRAPHY

-  Watercourse
-  Lake
-  Natural watershed

**AGNICO EAGLE**

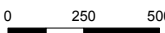
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AMARUQ GOLD MINING PROJECT
Water Quality and Flow Monitoring Plan

Site Layout and Monitoring Plan
Year 1: 2019

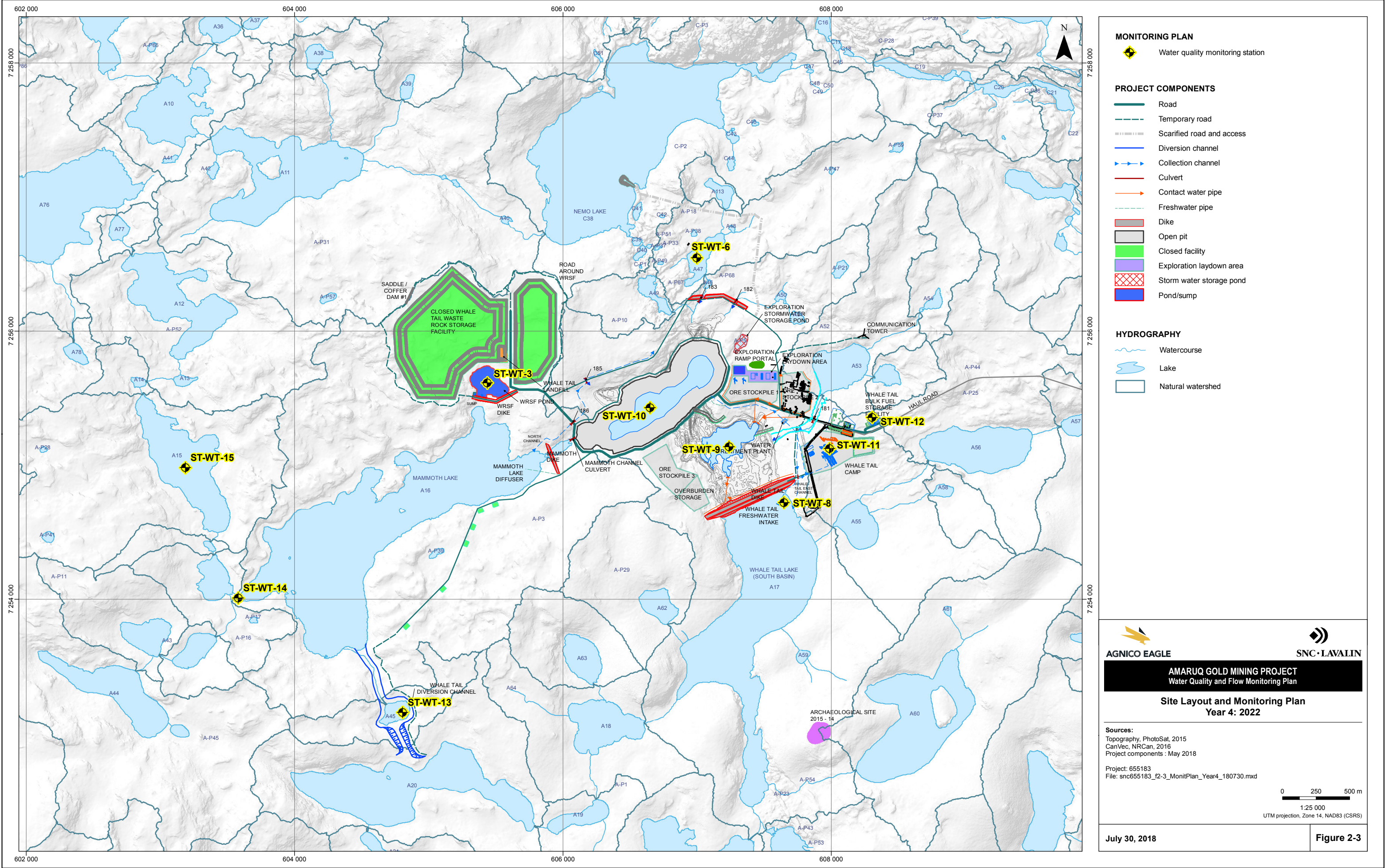
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Topography, PhotoSat, 2015
CanVec, NRCAN, 2016
Project components : May 2018

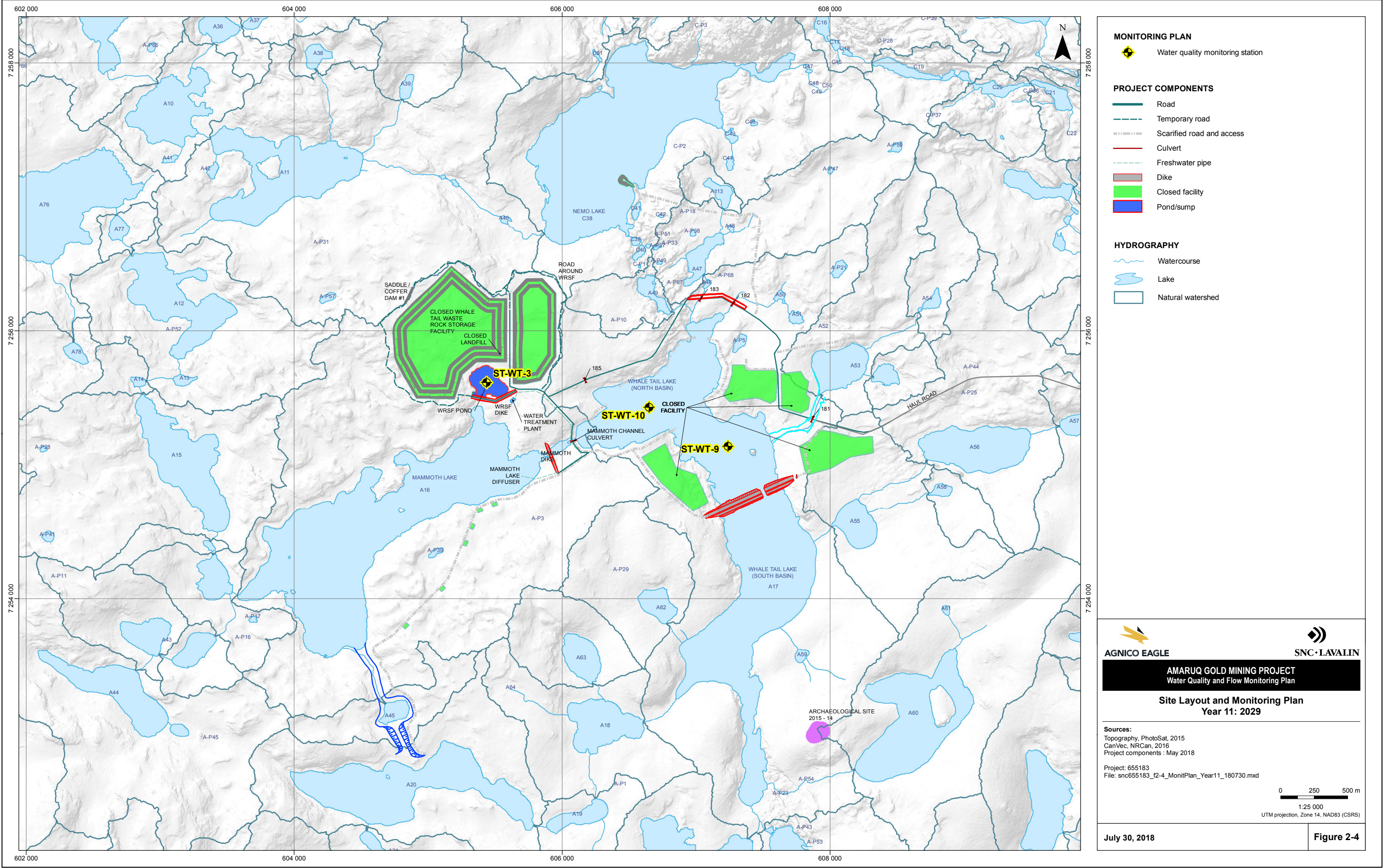
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1:25 000
UTM projection, Zone 14, NAD83 (CSRS)

July 30, 2018

Figure 2-2





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.

2.3.2 Operations Phase

During the operations phase, mining will occur in the Whale Tail Pit. Most of the waste rock generated from the pit will be deposited in the waste rock storage facility (WRSF), 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-WTP1826 Type A Water Licence. During the early operations phase, mine water from the individual pit sumps including dike seepage will be pumped to the Attenuation Pond. Water from the Attenuation Pond will be discharged to Mammoth Lake during the open water period on an annual basis through a diffusor. This water will be treated as required (e.g., TSS arsenic, and phosphorus) prior to being discharged.

The operations phase will span three to four years, from Year 1 (2019) to Year 4 (2022).

2.3.3 Closure Phase

Mining activities are currently expected to end during Year 4 (2022). Closure will occur from Year 4 (2022) to Year 11 (2029) after the completion of mining and will include removal of the non-essential site infrastructure and flooding of the mined-out open pit, as well as reestablishment of the natural Whale Tail Lake water level.

2.3.4 Post Closure Phase

Activities during the post-closure phase will be primarily monitoring of selected mine facilities including flooded pit lakes and the reclaimed WRSF area. The Dikes will be breached once water quality within the pit lake meets discharge criteria – CCME guideline for the Protection of Aquatic Life and background levels for parameters not listed in the CCME guideline.

Post-closure monitoring to confirm physical and chemical stability is planned until 2046.

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 (CM) 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 Whale Tail Pit Attenuation Pond during the operations phase of the mine;
- monitoring points located within the pit lake before and after the dikes have been breached during the post-closure phase of the mine life; and
- runoff from Waste Rock Storage Pond 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 Licence. In summary, 5 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; and
- Group 5 – MDMER.

Figures 2-1 to 2-4 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 CIRNAC water inspector.

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 Multi-Lab Direct 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 3-1: 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 Final 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-DD-1 to TBD | Monitoring 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 Final 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 ^(a) | 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 1 | 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 |

| Station | Description | Phase | Monitoring Parameters or Group | Frequency |
|----------|---|--------------|--------------------------------|---|
| ST-WT-3 | Waste Rock Storage Facility (WRSF) Pond prior to pumping to Attenuation Pond | Operations | Group 1 | Four times per calendar year, at least two weeks apart, when water is present. Two of the annual sampling events will coincide with: 1) the end of freshet; and 2) when the active zone has penetrated to its greatest depth (assumed to be in August). |
| | | Closure | Group 1 | Four times per calendar year, at least two weeks apart, when water is present. Two of the annual sampling events will coincide with: 1) the end of freshet; and 2) when the active zone has penetrated to its greatest depth (assumed to be in August). |
| | Waste Rock Storage Facility (WRSF) Pond prior to discharge to Mammoth Lake | Post-closure | Group 1 | Four times per calendar year, at least two weeks apart, when water is present. Two of the annual sampling events will coincide with: 1) the end of freshet; and 2) when the active zone has penetrated to its greatest depth (assumed to be in August). |
| 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 |
| 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 |

| Station | Description | Phase | Monitoring Parameters or Group | Frequency |
|----------|--|--------------|--------------------------------|---|
| | | 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 |

a) Figure 2-2 shows this station in Mammoth Lake near the discharge location. The actual station representing final effluent quality before discharge will be location within the treatment plant and before effluent is released through the pipeline.

Table 3-2: Monitoring Parameters

| Group | Parameters |
|-------|---|
| 1 | pH, turbidity, hardness, alkalinity, ammonia nitrogen, total metals (aluminum, arsenic, barium, cadmium, chloride, chromium, copper, fluoride, iron, lead, manganese, mercury, molybdenum, nickel, nitrite, nitrate, selenium, silver, thallium, zinc) sulphate, TDS, TSS. |
| 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, ortho-phosphate, 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, and TSS, turbidity.</p> |
| 3 | MDMER parameters (arsenic, copper, lead, nickel, zinc, total suspended solids, 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, total suspended solids, pH, effluent volumes and flow rate of discharge, acute lethality (Rainbow Trout and Daphnia magna) and environmental effects monitoring (EEM). |

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

| 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

In order 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 Project to specifically address the monitoring requirements for these activities (Refer to Section 3 of that plan).

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 waste rock storage facility, 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 Pond) 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 waste rock storage facility during open water season or after a major rain event occurs. Seepages identified at the waste rock storage facility will be pumped to the WRSF collection 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 (Diversions and Effluent)

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

The design of the ditches is based on the assumption that drainage can be achieved by gravity flow; the design for the sumps and ponds assumes that all inflows can be collected by gravity. As a result, this infrastructure is considered as low maintenance. However, 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 compliance monitoring program will be collected:

- Whale Tail 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-13).

Effluent discharged from the Whale Tail Pit Attenuation Pond at CM station ST-WT-2 is directed to Mammoth Lake through the Whale Tail Pit diffuser. Discharge from Mammoth Lake 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 – Discharge from the Mammoth Lake diffuser

| 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 Schedule 1. The followings 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 pit not used for site development purposes will be trucked to the Whale Tail Pit WRSF. Samples will be collected at the WRSF Pond [ST-WT-3] 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 WRSF 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 (Agnico Eagle 2018b).

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 Whale Tail Pit Attenuation Pond and then discharged through the Whale Tail Pit Diffuser. 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.

Fuel storage at the Whale Tail site will be similar to that at Meadowbank Mine. There will be one above ground storage tank with 1.5 million liters capacity. 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 exploration access road from Vault to the Amaruq exploration camp site will be expanded in width (from 6.5 m to 9.5 m) and upgraded to a haul road. Road surfacing will be constructed using non-potentially acid generating (NPAG) Vault waste rock and aggregates from the quarry sites and esker material. Approved borrow sources will be used for construction of the access road and will be used to expand the access road to a haul road; some of these will remain open for the duration of the mine to service the road. 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 CCME and MDMER guidelines

Visual Inspections

The watercourse crossing visual inspection and maintenance program is designed to identify

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

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

In 2014 and 2016, a geochemical characterization study was carried out for esker 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. Vault waste rock with a total sulphur content below 0.2% will be selected in order to avoid use of PAG material.

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* (Agnico Eagle 2018a) describes the groundwater monitoring plan for the 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).

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 for Mammoth Lake 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; FEIS, Volume 8, Appendix 8-D.6); and
- Emergencies (Emergency Response Plan; FEIS, Volume 8, Appendix 8-D.3).

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* (FEIS, Volume 8, Appendix 8-D.4).

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* (FEIS, Volume 8, Appendix 8-D.6).

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 3-6 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.

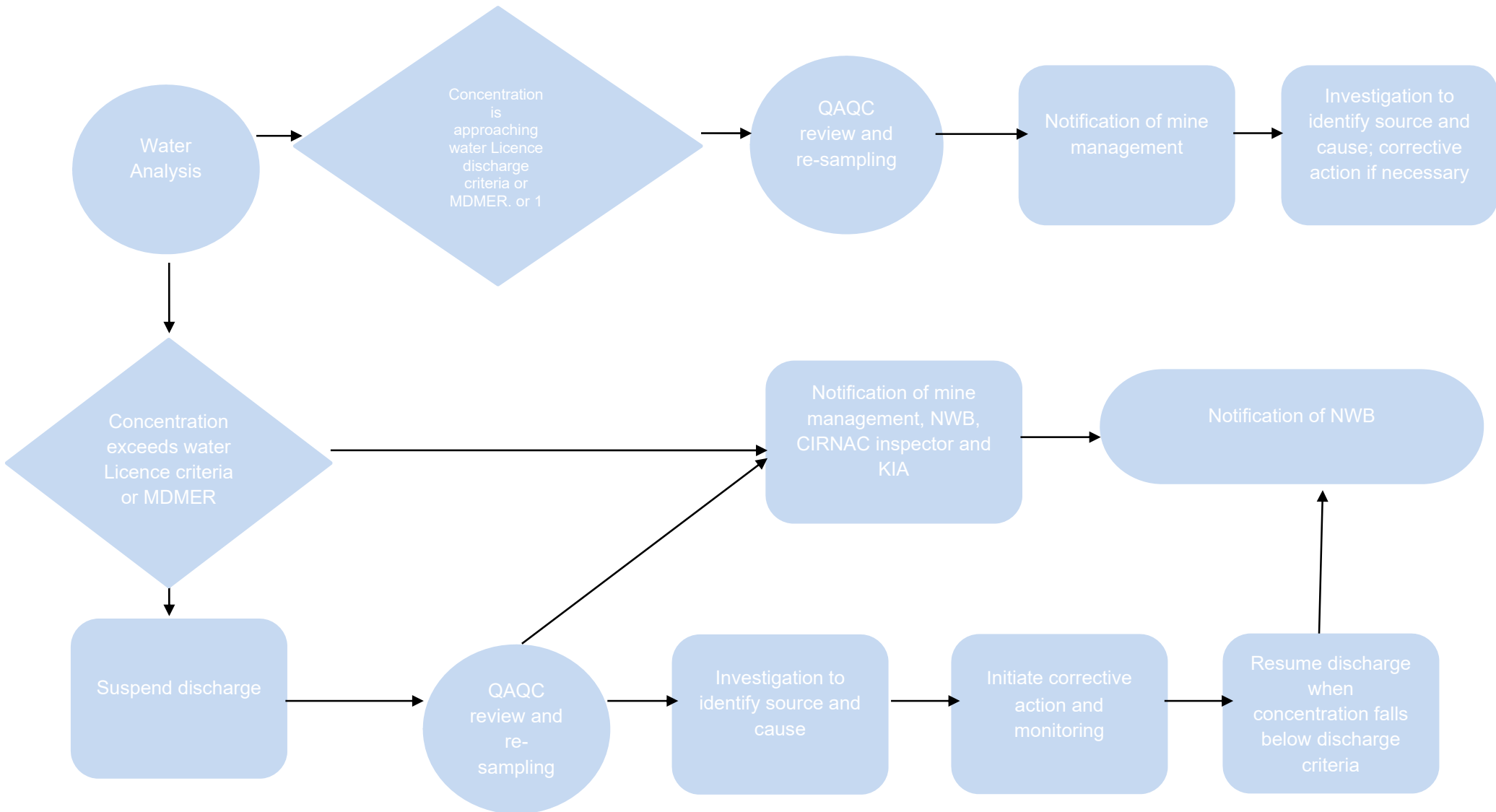
In addition to the mitigative measures listed above, a number of other possible alternatives are available to reduce or treat contaminants. These mitigation measures include:

- 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 2015 Design Document (Azimuth, 2015).

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.

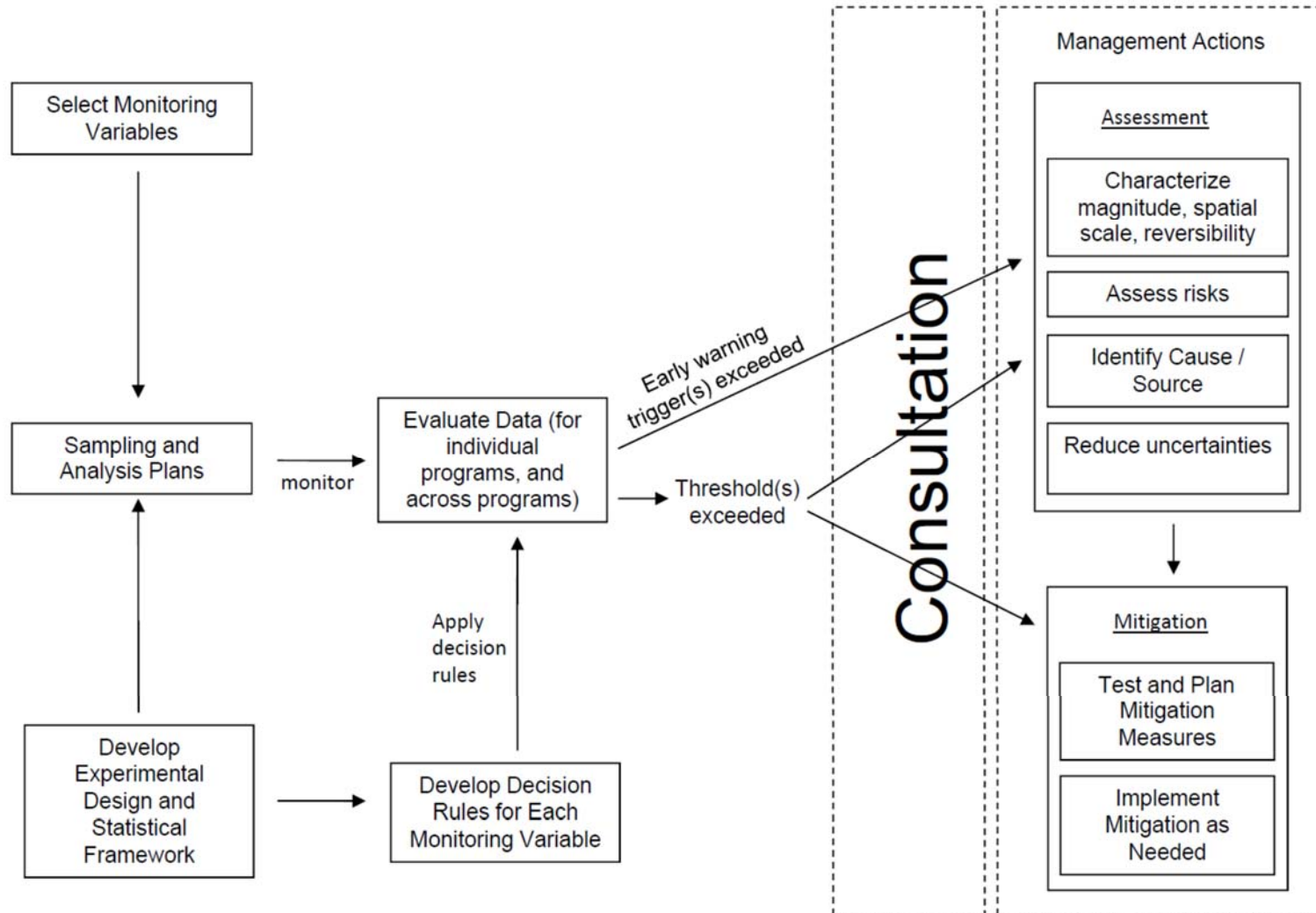
Nevertheless, there are two general classes of management actions – those aimed at further assessment and those aimed at mitigation. In general, exceedance of early warning triggers will trigger further assessment, which may then lead to mitigation, whereas exceedances of thresholds could possibly lead 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 ditches 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-11) and fresh water (Whale Tail Lake South Basin, ST-WT-8) transferred to the pit lake;
- The volume of water discharged from the Attenuation Pond to a diffuser (ST-WT-2);

The intervals of pumping for contact water at Whale Tail Pit are listed in Table 4-1 below.

Table 4-1: Intervals of pumping for Surface Water, Mine Operation Period

| Pumped from | Pumped to |
|--|-----------------------------|
| Whale Tail Industrial Sector (Year 1 to Year 4) (ST-WT-11 and ST-WT-12) | Whale Tail Attenuation Pond |
| Whale Tail Ore Stockpile (Year 1 to Year 4) (ST-WT-18A and B) | Whale Tail Attenuation Pond |
| Whale Tail Waste Rock Storage Facility Pond (Year 1 to Year 4) (ST-WT-3) | Whale Tail Attenuation Pond |
| Whale Tail Open Pit Sumps (Year 1 to Year 4) (ST-WT-4) | Whale Tail Attenuation Pond |

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 Nunavut Water Board (NWB), Indigenous and Northern Affairs Canada (CIRNAC) Water Licence 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, Nunavut Impact Review Board, 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 Impact Assessment (EIS) 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

- Agnico Eagle (Agnico Eagle Mines Limited). 2016. Final Environmental Impact Statement and Type A Water Licence Amendments. Whale Tail Pit. Report Number 1541520.
- Agnico Eagle. 2017a. Whale Tail Pit Final Information Request Responses. January 2017.
http://www.nirb.ca/app/dms/script/dms_download.php?fileid=307371&applicationid=124683&sessionid=7ge0bjmft6458r8co9v5b639g4
- Agnico Eagle. 2017b. Whale Tail Pit Final Technical Comment Responses. April 2017.
http://www.nirb.ca/app/dms/script/dms_download.php?fileid=309317&applicationid=124683&sessionid=7ge0bjmft6458r8co9v5b639g4
- Agnico Eagle. 2018a. Whale Tail Pit Groundwater Monitoring Plan (GWMP). May 2018.
- Agnico Eagle. 2018b. Operational ARD-ML Sampling and Testing Plan – Whale Tail Pit Addendum, V2. April 2018
- Agnico Eagle. 2018c. Whale Tail Pit Water Management Plan. Version 2. July 2018.
- Azimuth. 2015. Core Receiving Environment Monitoring Program (CREMP): 2015 Plan Update. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. November, 2015.
- Azimuth. 2016. Core Receiving Environment Monitoring Program (CREMP): 2015 Plan Update – Whale Tail Pit Addendum. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. May, 2016.
- Azimuth. 2018. Core Receiving Environment Monitoring Program (CREMP): 2015 Plan Update – Whale Tail Pit Addendum. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. May, 2018.
- Golder (Golder Associates Ltd.). 2017. Predicted Water Quality and Planned Water Treatment. Meeting notes and PowerPoint presentation to Environment and Climate Change Canada (ECCC) on June 7, 2017.
- Nunavut Impact Review Board. Project Certificate No. 008. March 2018
- Nunavut Water Board. 2018. Water Licence 2AM-WTP1826. May 2018.