Y:\burnaby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\99_PROJECTS\1541520_FEIS\02_PRODUCTION\FEIS\MXD\1300_Documentation\11340_Project_Description\Report\WATER_MANAGEMENT_PLAN\1541520_FIG_2-2_CANADA_PERMAFROST.mxd

140°0'0"W 130°0'0"W 120°0'0"W 110°0'0"W 100°0'0"W 90°0'0"W 80°0'0"W 70°0'0"W 60°0'0"W 50°0'0"W

60°0'0"N

50°0'0"N

40°0'0"N

110°0'0"W 100°0'0"W 90°0'0"W 80°0'0"W

STUDY AREA

PERMAFROST AND GROUND ICE

Extent of permafrost (% of land area underlain by permafrost)

Ground ice content in the upper 10-20 m of the ground (% by volume of visible ice)

Includes segregated ice, intrusive ice, reticulate ice veins, ice crystals and ice coatings on soil particles

	High (>20%)	Medium (10-20%)		Low (<10%)		Nil (0%)	
Continuous Permafrost (90-100%)	Ch	Cmh	Cm	Clm	Cl		
Extensive Discontinuous Permafrost (50-90%)			Em	Elm	El	Enl	
Sporadic Discontinuous Permafrost (10-50%)				Slm	Sl	Snl	
Isolated Patches (0-10%)				Ilm	Il	Inl	In
No Permafrost (0%)							
Subsea Permafrost				Olm			

Boundaries of permafrost and ground ice units
Defined (derived from physiographic boundaries, after Bostock, 1970)
Gradational or estimated (derived in part from permafrost zone boundaries, after Brown, 1978)

General distribution of known occurrences of large bodies of ground ice
▼ ▽ Ice wedges (abundant, sparse)
▬ ▭ Massive ice bodies (abundant, sparse)
▲ △ Pingo ice (abundant, sparse)

Permafrost temperature (°C)
● -3.0 Mean annual ground temperature at base of the layer of annual temperature fluctuations

Permafrost thickness (m)
■ 100 Measured or interpolated
■ (120) Extrapolated or calculated
■ 140/175 Range of thickness in nearby boreholes
◆ 680 Thickness of subsea permafrost
Glaciers

EXPLANATION OF LEGEND

Variations in the extent of permafrost are shown by colours (hues). Variations in the amount of ground ice are shown by colour intensity and, for the large bodies of ground ice, by symbols. Letter codes assist in determining to which basic permafrost and ground ice class any particular unit belongs. The symbols for the large bodies of ground ice are an essential component of the definition of the map units. For example,

Elm ▽ ▲

indicates a unit underlain by extensive discontinuous permafrost with low to moderate ice content, and characterized by sparse ice wedges, no massive ground ice, but abundant pingo ice.

Research by J. A. Heginbottom, Terrain Sciences Division, Geological Survey of Canada, Natural Resources Canada. Additional research and adaptation for the National Atlas of Canada by M. A. Dubreuil and P. T. Harker, National Atlas Information Service, Geomatics Canada, Natural Resources Canada. Cartography and production support by A. Caron, F. Paul and I. Rose, National Atlas Information Service.

REFERENCE

PROPOSED HAUL ROAD FROM AGNICO EAGLE MINES LIMITED (AGNICO EAGLE).
PERMAFROST MAP OF CANADA PRODUCED BY THE NATIONAL ATLAS INFORMATION SERVICE, CANADA CENTRE FOR MAPPING, GEOMATICS CANADA, AND THE TERRAIN SCIENCES DIVISION, GEOLOGICAL SURVEY OF CANADA, NATURAL RESOURCES CANADA. PRINTED 1995 (MCR 4177).
DATUM: NAD 83 CSRS PROJECTION: CANADA ATLAS LAMBERT

280 0 280
KILOMETRES

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION
WHALE TAIL PIT PROJECT

TITLE

PERMAFROST MAP OF CANADA

Golder Associates

PROJECT		1524321	FILE No.	
DESIGN	DO	28 OCT. 2015	SCALE AS SHOWN	REV. 0
GIS	CDB	11 MAY 2016		
CHECK	SO	06 Jun. 2016		
REVIEW	LY	06 Jun. 2016		

FIGURE 2.2

2.1.3 Hydrology

Hydrology characteristics were extracted from surface water quantity impact assessment section (Volume 6, Section 6.3; Volume 6, Appendix 6-C).

The proposed mine site is located in the A watershed (i.e., where Lake A17 [Whale Tail Lake] and Lake A16 [Mammoth Lake] are located), and water management activities are planned in the A watershed, and the C watershed (i.e., where Lake C38 [Nemo Lake] is located); these two watersheds drain into Lake DS1, which drains north to the Meadowbank River. These watersheds comprise an extensive network of lakes, ponds, and interconnecting streams, and have lake water surface fractions (i.e., the ratio of lake area to watershed area) of 16% (A watershed) and 23% (C watershed).

Shorelines in the mine site area exhibit a consistent terrain type related to shorelines that have developed in morainal material. These morainal shorelines were observed at all lakes visited during the 2015 field survey. Limited areas of bedrock and shallowly sloped sandy shorelines were also observed. As a general characteristic for the surveyed shorelines, the predominant materials are boulder gardens mixed with cobble with very limited soils or organic materials on top. The outlet channels are relatively short with a low sinuosity (i.e., close to 1.0) and exhibit the same characteristics for streambed materials, which results in interstitial flow through large boulders or below the surface likely close to the bedrock, making flow difficult to observe and measure.

Discharges of watercourses in the mine site area typically peak in late-May to mid-June from snowmelt, rapidly decline in July, and low discharges prevail until frozen conditions in October to November, with a secondary peak in September from rainfall events. Watercourses in the Project area are frozen over the winter.

Derived long-term mean annual water yield for selected lakes in the mine site area vary between 86 mm at Lake C38 (Nemo Lake) to 230 mm at Lake A69. These water yields are similar to regional water yields reported at the Meadowbank Mine.

2.1.4 Surface Water Quality

Water quality characteristics were extracted from the water quality baseline report (Volume 6, Appendix 6-G) and the water quality impact assessment section (Volume 6, Section 6.4). Baseline water quality sampling was conducted at lakes and tributaries in various watersheds in the study area during open-water conditions in 2014 and 2015.

Surface water collected from lakes during the open water season was characteristic of low productivity headwater lakes in the Arctic; soft water, with low alkalinity, low turbidity (and corresponding high Secchi depth) and low total suspended solids (TSS). There was minor thermal stratification evident at some deeper lake stations. The water columns of lakes are well oxygenated and pH was neutral to slightly acidic. The majority of water chemistry parameter concentrations were below the analytical detection limit and below the Canadian Council of Ministers of the Environment

water quality guidelines for the protection of aquatic life (CCME 1999) and the Canadian drinking water guidelines (Health Canada 2014).

Samples collected from the tributaries showed them to be well oxygenated, with low conductivity, and neutral to slightly alkaline pH. As with the lakes, the majority of the water chemistry parameter concentrations were below the aquatic life and drinking water quality guidelines.

2.1.5 Climate Change

Climate change information presented herein was extracted from the air quality impact assessment section (Volume 4, Section 4.2).

The climate in the Arctic is changing faster than at mid-latitudes (IPCC 2014). The most recent set of climate model projections (CMIP5) predict an Arctic-wide year 2100 multi-model mean temperature increase of +13°C in late fall and +5°C in late spring under the IPCC's "business as usual scenario" (RCP8.5). IPCC climate change mitigation scenario RCP4.5 results in a year 2100 multi-model Arctic wide prediction of +7°C in late fall and +3°C in late spring (Overland et al. 2013). The effects of changes of this magnitude to terrestrial, aquatic and marine ecosystems, social and economic systems of the Arctic are an active area of research. However, the short duration of the proposed Project means that climate change related effects to the Project are likely negligible.

2.1.6 Seismic Zone

The mine site is situated in an area of relatively low seismic risk. The peak ground acceleration (PGA) for the area was estimated using seismic hazard calculator from the 2010 National Building Code of Canada website (http://www.earthquakescanada.nrcan.gc.ca/hazard-alea/interpolat/index_2010-eng.php). The estimated PGA is 0.019 g for a 5% in 50-year probability of exceedance (0.001 per annum or 1 in 1,000 year return) and 0.036 g for a 2% in 50-year probability of exceedance (0.000404 per annum or 1 in 2,475 year return) for the area.

2.2 Mine Operations Description

2.2.1 Mine Development Plan

Whale Tail Pit will be mined using traditional open pit method, and the mining is planned from Q2 of Year -1 (2018) to the end of Year 3 (2021).

Two mine waste streams will be produced at the mine site, waste rock and overburden material. Approximately 46.1 Mt of waste rock and 5.6 Mt of overburden will be generated on site. As ore is transported to the Meadowbank Mine for processing, tailings (8.3 Mt) report to the Meadowbank tailings storage facility (see the Addendum to the Meadowbank Mine Waste Rock and Tailings Management Plan).

The mine development will include the following major infrastructure:

- industrial area (camp and garage);
- crusher;
- ore stockpiles;
- rock and Overburden Storage facilities;
- landfill;
- haul and access roads; and
- open pit mine.

In addition, the mine development will include construction of water management facilities, listed in Section 3.1.2.

2.2.2 Summary of Mine Waste Management

This section describes a summary of the mine waste management plan. More detailed information on mine waste management is presented in the Addendum to the Meadowbank Mine Waste Rock and Tailings Management Plan. Water management associated with mine waste management is described in Section 3.1.4 of this document. One area was identified as the Whale Tail WRSF to store waste rock and overburden material, as shown in Figure A.1 to Figure A.4 in Appendix A. Table 2.3 presents a summary of the total tonnage of mine waste materials and their proposed usage or destination.

Table 2.3 Summary of Mine Waste Tonnage and Destination

Mine Waste Stream	Estimated Quantities	Waste Destination
Overburden	5.6 Mt	Temporary storage on the west shore of Lake A17 (Whale Tail Lake) for construction purposes
		Co-disposed with waste rock within Whale Tail WRSF
Waste Rock	46.1 Mt	Dike, pad and, road construction
		Whale Tail WRSF
		Closure and site reclamation
Tailings	8.3 Mt	As slurry tailings placed in the approved Meadowbank Mine tailings storage facility

WRSF = Waste Rock Storage Facility; Mt = million tonne.

SECTION 3 • WATER MANAGEMENT PLAN AND WATER BALANCE

3.1 General Water Management Strategy

3.1.1 Water Management Objectives and Strategies

The goal of water management is to minimize the impact of the mine activities on the aquatic ecosystem surrounding the mining area. The key objectives for water management are:

- keep the different water types (i.e., contact, non-contact, and freshwater) separated to the extent practical;
- control and minimize contact water through diversion and containment;
- minimize freshwater usage by recycling and reusing the contact water to the extent practical; and
- meet discharge criteria before any site contact water is released to the downstream environment.

To achieve the above water management objectives, the following key strategies were implemented to develop the Plan:

- Two levels of catchment disturbance have been defined for the area, namely undisturbed and disturbed. Areas that have been disturbed as part of the mine development are considered disturbed catchments, while the areas left unaffected are considered undisturbed catchments.
- For the purpose of mine water management, runoff from undisturbed areas is considered non-contact water, while runoff from disturbed catchment areas is considered contact water. Surface water that is diverted around the mine facilities, or groundwater that does not emerge into a mine facility, is considered non-contact water. Any non-contact water that mixes with contact water becomes contact water.
- Conveyance and storage of contact water will be controlled by channels and containment structures (i.e., sumps and ponds). Sumps will be installed in the open pit and in low points surrounding the open pit. Contact water will be diverted and collected in various sumps and water collection ponds and conveyed to the Whale Tail Attenuation Pond.
- The collected water will be treated if the water quality does not meet the discharge criteria established in the water licence.
- The treated water will be reused as much as possible to minimize the freshwater requirements. The excess treated water will be discharged into Lake A16 (Mammoth Lake) through a submerged diffuser.
- Non-contact water will be intercepted and directed away from disturbed areas by means of natural catchment boundaries and/or man-made diversion structures and will be allowed to flow to the neighbouring waterbodies.

3.1.2 Water Management System

The water management system includes the following components (identified on Figure A.1 to Figure A.4 in Appendix A):

- four Turbidity Curtains;
- two contact water collection ponds (Whale Tail Attenuation and Whale Tail WRSF);
- two freshwater collection ponds (Whale Tail Lake (South Basin) and Northeast Sector);
- three proposed water diversion channels (Whale Tail, East, and North, if deemed necessary);
- four water retention dikes (Whale Tail, Mammoth, Whale Tail WRSF, and Northeast);
- two coffer/saddle dams;
- seven proposed culverts (Culverts 181, 182, 183, 184, 185, 186, and Mammoth Channel Culvert, if deemed necessary);
- a freshwater intake causeway and pump system;
- a WTP and associated intake causeway;
- a WTP for construction;
- a Sewage Treatment Plant (STP);
- pipeline and associated pump system;
- a Potable WTP; and
- a discharge diffuser located in Lake A16 (Mammoth Lake).

3.1.3 Waterbody Inventory

The A and C watersheds will potentially be impacted by mining activities, primarily by dewatering of Whale Tail Lake (North Basin) to Lake A16 (Mammoth Lake), the Northeast Diversion to the C watershed, and the Whale Tail Lake (South Basin) Diversion to Lake A16 (Mammoth Lake). Waterbodies directly impacted by mining activities are presented in Table 3.1 and shown in Figure A.2 in Appendix A.

Table 3.1 Inventory of Waterbodies Directly Impacted by Mining Activities

Watershed	Primary Disturbance	Waterbody	Note
A	Dewatering	Lake A16 (Mammoth Lake)	Receiving lake during dewatering activities
	Northeast Diversion	Lake A47	Flooded
		Lake A48	Flooded
		Lake A55	Flooded
		Lake A62	Flooded
		Lake A63	Flooded
		Lake A65	Flooded
		Lake A113	Flooded
		Pond A-P38	Flooded
		Pond A-P68	Flooded
	Whale Tail Lake (South Basin) Diversion	Lake A18	Flooded
		Lake A19	Flooded
		Lake A20	Flooded
		Lake A21	Flooded
		Lake A22	Flooded
		Lake A45	Part of diversion channel
		Lake A55	Flooded
		Lake A62	Flooded
		Lake A63	Flooded
		Lake A65	Flooded
		Pond A-P1	Flooded
		Pond A-P53	Flooded
	Various Water Management Activities	Lake A17 (Whale Tail Lake)	Water management activities include diversion of upper watershed and dewatering of Whale Tail Lake (North Basin)
C	Water Intake	Lake C38 (Nemo Lake)	

3.1.4 Water Management Plan during Construction and Operations

3.1.4.1 Infrastructure Required for Mine Site Water Management

During the mine construction, operational and closure phases, a network of collection and interceptor channels and sumps will be constructed and maintained to facilitate mine site water management. A list of the water management control structures and facilities is presented in Table 3.2 together with the proposed construction schedule. These structures were designed according to design criteria presented in Volume 2, Appendix 2-J. Final design details of these structures will be provided to the regulators for approval at least 60 days prior to construction.

Figure A.1 to Figure A.4 in Appendix A show the location of the respective structures at the different development stages of the mine life. Information on operation, maintenance, and surveillance (OMS) of Project dikes is provided in the following sub-sections.

Table 3.2 Water Management Facilities and Construction Schedule

Mine Year	Figure	Water Management Facilities Constructed or Installed
Year -1 (2018) Construction	A.1	• Turbidity Curtains • Start Whale Tail Dike • Start Mammoth Dike • Start the contact water intake causeway in the Whale Tail Attenuation Pond • Whale Tail WRSF Dike • Freshwater intake causeway in Nemo Lake • Water Treatment Plant and Construction Water Treatment Plant • Pipeline and associated pump system • Sewage Treatment Plant • Potable Water Treatment Plant • Discharge diffuser in Mammoth Lake • Culverts 184, 186, and Mammoth Channel
Year 1 (2019) Operations	A.2	• Complete Whale Tail Dike • Complete Mammoth Dike • Complete the contact water intake causeway in the Whale Tail Attenuation Pond • Northeast dike • Whale Tail Lake (South Basin) Diversion Channel • Whale Tail East Channel and Saddle/Coffer Dam • If deemed necessary, North Diversion Channel • Saddle/Coffer Dam #1 in Whale Tail WRSF

WRSF = Waste Rock Storage Facility.

3.1.4.2 Dike Construction

The Whale Tail Dike is intended to raise Whale Tail Lake (South Basin), Lake A18, Lake A19, Lake A20, Lake A21, Lake A22, Lake A55, Lake A62, Lake A63, Lake A65, Pond A-P1, and Pond A-P53, to an elevation of 156 metres above sea level (masl), and divert runoff downstream to the Lake A16 (Mammoth Lake) watershed through the Whale Tail Lake (South Basin) diversion channel. Whale Tail Dike will be a zoned rockfill dike on the lakebed foundation and comprise a cutoff wall acting as a seepage barrier. The construction technique will differ for the sections extending into the existing lake from those on land for the abutments. For the lake sections of the dike, construction will be initiated by advancing two single-line platforms built 1.5 m above the existing water level. After cleaning out the central key trench, backfill will be gently deposited to its full height and dynamically compacted. The type of material used for the cutoff wall of this section will be soil bentonite backfill. Maximum

height of the soil bentonite wall will be 9.0 m. For the abutment section, it is expected that bedrock will be encountered at a 10 m depth based on exploration data. The material encountered will be frozen into the permafrost and the foundation will have to be drilled and blasted to an adequate slope before being backfilled and compacted. The design for this sector takes into account that the foundation could thaw after raising the water level of the reservoir by 4.0 m. A plastic concrete cutoff will be necessary for these sections (East and West) to minimize the risks of loss of properties of the abutment (deformation) and possible seepage and loss of material from the wall. This cutoff will be backfilled with an adequate mix of cement, soil and bentonite. A grout curtain of 10 m will be injected to treat fractured bedrock along the alignment. The contact with bedrock will also be injected to block this flow path. Grouting will not be required for zones where temperatures will remain below the freezing point at the end of operations.

The performance of the Whale Tail Dike will be evaluated based on the quantity of seepage collected (compared to the design estimate). This structure will be highly instrumented with sections of piezometers and thermistor strings to understand the hydraulic and thermal behaviour during reservoir filling. The thermal regime, especially near the abutment, will be monitored to note the thermal impact of raising the lake water level. Monuments and inclinometers will be installed along the dike's sensitive points. Typical sections of the Whale Tail Dike and of the Whale Tail Dike abutment are shown in Figure 3.3. All design drawings and figures are found in Volume 1, Appendix 1-C.

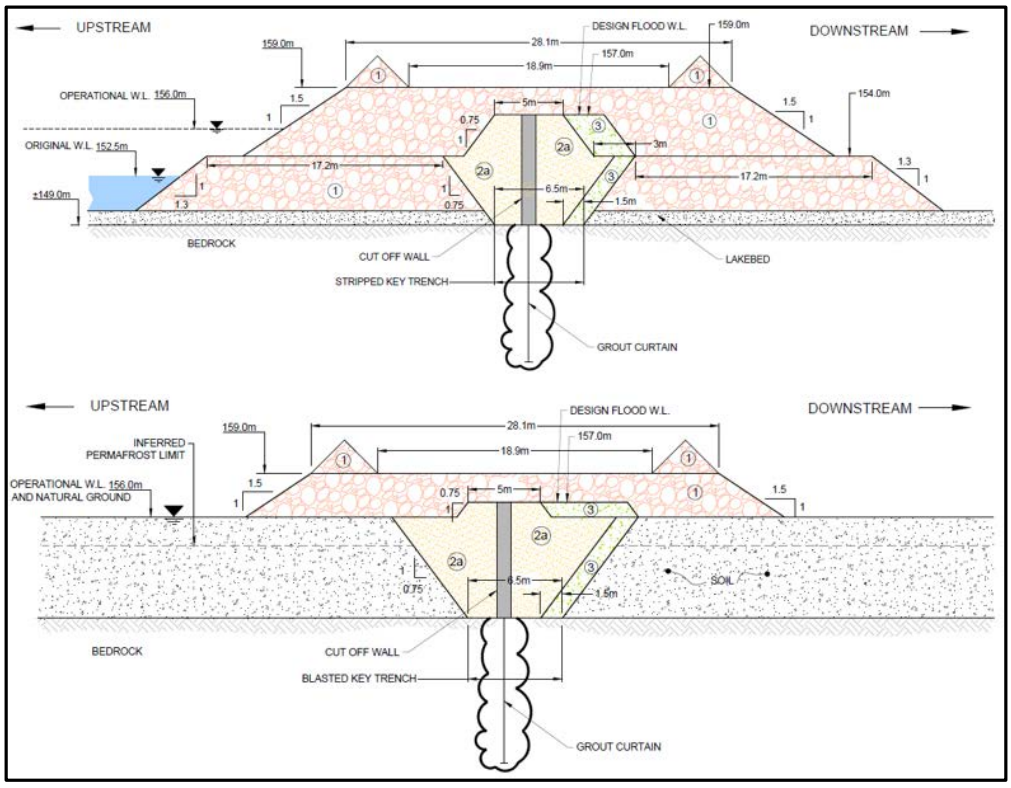

Figure 3.3 Typical Sections of the Whale Tail Dike and Whale Tail Dike Abutment

Note: Adapted from SNC (2015).

The Mammoth Dike is intended to protect the mine site area from potential backwatering from Lake A16 (Mammoth Lake) during the operational and closure phases. Mammoth Dike will be a rockfill dike sealed on its upstream face with a till plug protected with rockfill. The key trench will extend down to the bedrock and all boulders along the alignment will be removed. A thermal cap of rockfill will be placed on top during the winter season to prevent it from thawing. A typical section of the Mammoth Dike is shown in Figure 3.4.

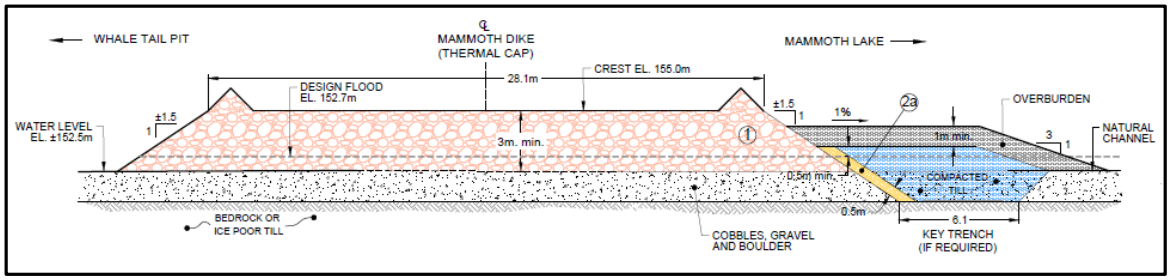

Figure 3.4 Typical Section of the Mammoth Dike

Note: Adapted from SNC (2015).

The Whale Tail WRSF Dike confines contact water in the Whale Tail WRSF Pond before it is pumped to the Whale Tail Attenuation Pond. The Whale Tail WRSF Dike will be a rockfill dike with a bituminous liner on its upstream face, anchored to the bedrock during the summer season. The liner will be sealed with till or grout and will take advantage of frozen soil conditions to integrate the permafrost into its foundation (and key trench). The key trench will be stripped during the summer season. All ice-rich material sensitive to thawing will be removed below the liner. Once the bedrock is exposed, the liner will be sealed with till or gravel amended with bentonite. While the geomembrane in the key trench is buried, a thermal cap will be put in place to protect the foundation against sources of heat. The thermal cap will also be used as a grouting platform to minimize potential seepage into the bedrock. A typical section of the Whale Tail WRSF Dike is shown in Figure 3.5.

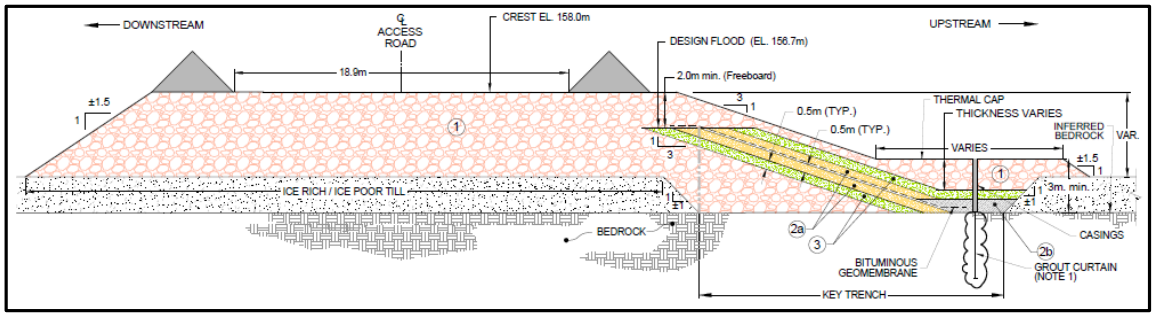

Figure 3.5 Typical Section of the Whale Tail Waste Rock Storage Facility Dike

Note: Adapted from SNC (2015).

The Northeast Dike is intended to raise Lake A47, Lake A48, Lake A113, Pond A-P38, and Pond A-P68 to an elevation of 156.7 masl, and divert runoff to the Lake C38 (Nemo Lake) watershed. The Northeast Dike will be a rockfill dike lined with bituminous geomembrane on its upstream face, and

anchored into a blasted key trench to the bedrock or to an appropriate foundation (ice-poor till). The construction will promote the extraction of heat to reinforce the permafrost of the key trench thus making it impervious. A thermal cap will be put in place to limit the penetration of heat into the foundation. A typical section of the Whale Tail WRSF Dike is shown in Figure 3.6.

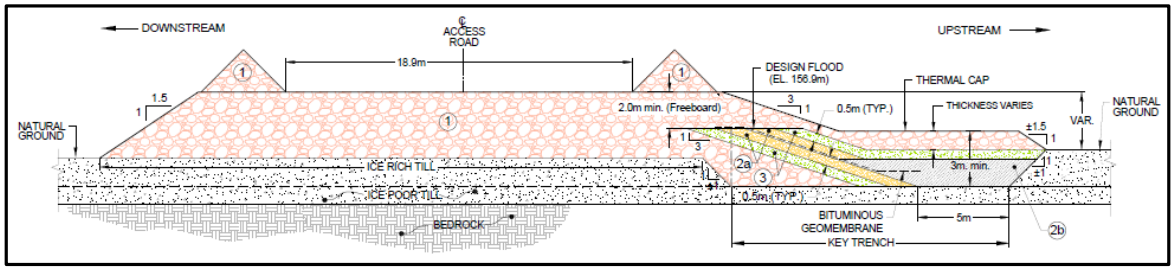

Figure 3.6 Typical Section of the Northeast Dike

Note: Adapted from SNC (2015).

During dike construction, both the dike material itself as well as the disturbed material on the lake floor (particularly in the deep areas of the lakes) will contribute to increases in concentrations of suspended sediments in the water column. In the absence of sediment control measures, suspended sediment plumes would be expected to migrate with wind-driven currents. The key means for minimizing suspended sediment discharges from the dike construction zones during dike construction include the deployment of Turbidity Curtains and water treatment (if deemed necessary).

For the construction of Whale Tail Dike, two layers of Turbidity Curtains will installed across Lake A17 (Whale Tail Lake) and on both sides of the dike. These curtains will be deployed concurrently with the start of the dike construction to protect the fish while the fishout is taking place. In addition, requirement for pumps installed in the water in front of the construction platform to neutralise the current created by the displacement of water from the deposition of rock in the lake will be evaluated at the beginning of the construction. If such mitigation measure is required, water will be pumped to the dewatering WTP and discharged into Lake A16 (Mammoth Lake) through the existing discharge diffuser system.

The proposed location for the Turbidity Curtains is shown in Figure A.1.

For Northeast Dike, no specific TSS management plan is expected as the construction of this facility is planned when the open pit will be in operation and contact water will be managed as part of the current operations.

3.1.4.3 Dewatering

To allow the mining of the Whale Tail Pit, Lake A17 (Whale Tail Lake) will be partly dewatered once the Whale Tail Dike is constructed. The estimated total volume of Whale Tail Lake (Lake A17) is 8.5 million m^3 (Mm^3); the upper portion of Lake A17 (3.4 Mm^3) will be pumped to either Whale Tail Lake (South Basin) or to Lake A16 (Mammoth Lake) through the discharge diffuser. It is assumed that

approximately 66% of the volume of water will be pumped directly to Whale Tail Lake (South Basin) if it meets discharge criteria, and the remaining 34% of water will be pumped to the WTP first and then discharged to Lake A16 (Mammoth Lake). The dewatering activity is planned from March to May 2019 to Whale Tail Lake (South Basin) and from June to September 2019 to Lake A16 (Mammoth Lake).

3.1.4.4 Key Water Management Activities during Construction and Operations

An inventory of waterbodies impacted by mining activities is provided in Table 3.1 (Section 3.1.3) and the facilities required for the Plan is provided in Table 3.2 (Section 3.1.4.1). These tables should be read in conjunction with Table 3.3 which presents the yearly major water management activities during the construction and operational phases. Water management activities during the closure phase are described in Section 3.2.

Table 3.3 Water Management Activities during Construction and Operations

Mine Year	Water Management Activities and Sequence
Year -1 (2018)	• Temporary pump contact water from open pit to the Whale Tail WRSF Pond • Treat turbid water from construction using the WTP and discharge in Lake A16 (Mammoth Lake) • Treat contact water from quarries using the construction WTP and discharge in Lake A16 (Mammoth Lake)
Year 1 (2019)	• Dewater Whale Tail Lake (North Basin) • Pump contact water from the open pit to the Whale Tail Attenuation Pond • Pump contact water from the Whale Tail WRSF Pond to the Whale Tail Attenuation Pond • Treat Whale Tail Attenuation Pond contact water and discharge in Lake A16 (Mammoth Lake) • Whale Tail East channel diverts non-contact water from Lake A53 to Whale Tail Lake (South Basin) • If deemed necessary, North channel diverts non-contact water from the north shore of the open pit to Lake A16 (Mammoth Lake)
Year 2 (2020)	• Northeast Pond flows towards the C watershed • Whale Tail Lake (South Basin) flows to Lake A16 (Mammoth Lake) through the Whale Tail Lake (South Basin) Diversion Channel

WRSF = Waste Rock Storage Facility; WTP = Water Treatment Plant.

A brief summary of the Plan during the construction and operational phases is presented as follows:

- Turbidity Curtains will be used during the construction of the Whale Tail Dike and, if deemed necessary for the construction of Mammoth Dike and Whale Tail WRSF Dike.
- During the construction, to the extent practical, turbid water originating from Lake A17 (Whale Tail Lake) and from the quarry will be treated and discharged in Lake A16 (Mammoth Lake).
- During the construction, to the extent practical, turbid water originating from the quarry will be temporary stored in the Whale Tail WRSF Pond.

- The main contact water pond of the Project (i.e., Whale Tail Attenuation Pond) is located in a deep part of Whale Tail Lake (North Basin).
- Contact water from the major mine infrastructure will be diverted and/or collected in the Whale Tail Attenuation Pond.
- Contact water from the Whale Tail WRSF Pond will be pumped to the Whale Tail Attenuation Pond.
- Runoff water in the open pit will be collected by the sumps and then pumped to the Whale Tail Attenuation Pond.
- Water collected in the Whale Tail Attenuation Pond will be reused to the extent practical in the open pit and dust control operations, and the excess water will be treated by the WTP prior to discharge to the receiving environment via the diffuser into Lake A16 (Mammoth Lake).
- Non-contact water is diverted away from the mine site infrastructure by reversing natural flows and/or using diversion channels.
- Freshwater usage on site will be supplied from Lake C38 (Nemo Lake) during operations, and from Whale Tail Lake (South Basin) during closure.

Table 3.4 summarizes the overall contact water management plan for the major mine infrastructure with the initial water collection location and final water destination. Detailed water management information for major mine infrastructure areas is described in the following sub-sections. Water management flowsheets for the construction and operations phase are provided in Appendix B.

Table 3.4 Overall Site Surface Contact Water Management Plan

Contact Water Source	Initial Contact Water Collection Location	Final Contact Water Collection Location
Industrial Sector	Whale Tail Attenuation Pond	Whale Tail Attenuation Pond
Whale Tail WRSF Sector	Whale Tail WRSF Pond	
Ore Stockpiles	Whale Tail Attenuation Pond	
Landfill	Whale Tail WRSF Pond	
Open Pit	Open pit sumps	

WRSF = Waste Rock Storage Facility.

3.1.4.5 Water Management in Whale Tail Waste Rock Storage Facility

One rock storage facility (i.e., the Whale Tail WRSF) will be used to permanently store all waste rock and overburden from mining activities. Seepage and runoff from the Whale Tail WRSF during the construction and operational phases will be managed via the Whale Tail WRSF Pond where the contact water will be pumped to the Whale Tail Attenuation Pond for further treatment. During the construction phase or until the Whale Tail WRSF Dike is operational, runoff and especially water

originating from thawed ice-rich soils will be managed with ditches and local sumps. All overburden soils will be stabilized with waste rock berms in order to limit spreading and soil water separation. More details about management of the Whale Tail WRSF are presented in the Mine Waste Rock and Tailings Management Plan.

3.1.4.6 Water Management for Ore Stockpile Areas

The ore stockpiles are located within the catchment of the Whale Tail Attenuation Pond as shown in Figure A.2 and Figure A.3 (Appendix A). Based on the topographic information, contact water will naturally flow to the Whale Tail Attenuation Pond for further treatment.

3.1.4.7 Water Management for the Pit Sector

The Whale Tail open pit is planned to extend to approximately 115 m below the ground surface. The open pit will be mined mostly within permafrost except for the north-central portion of the pit which will be within the closed talik at the northern end of Lake A17 (Whale Tail Lake). The pit does not extend through the bottom of the closed talik; however, the open pit acts as a sink for groundwater flow during operations, with water induced to flow up through the open talik beneath the central portion of Lake A17 (Whale Tail Lake) and into the open pit. Accordingly, groundwater inflows into open pit are expected, this water will be mixed with the open pit contact water and pumped the Whale Tail Attenuation Pond for further treatment.

3.1.4.8 Water Management for Haul Road

A network of access and haul roads will connect the ore body to the Whale Tail WRSF Sector and the Industrial Sector. The majority of the roadways servicing the mining area will drain directed towards the proposed contact water management infrastructure. Detailed information on roads is described in the Whale Tail Pit Haul Road Management Plan.

The approach to water management for these roads will involve the implementation of local best management practices during the construction, operational, and closure phases. The roads will be constructed of non-potential for acid generating and non-leaching waste rock from mining operations. Other best management practices will strive to minimize the amount of runoff originating from the roadways and to prevent the migration of surfacing material from the roadways and crossings. Any areas identified as point sources of runoff originating from the roadways or crossings can be managed locally with silt fences, Turbidity Curtains, interceptor channels, rock check dams, and/or small sedimentation ponds.

3.1.4.9 Water Management for Landfill

The landfill is located southeast of the Whale Tail WRSF, within the catchment of Whale Tail WRSF Pond, as shown in Figure A.2 to Figure A.4 (Appendix A). Based on the topographical information (PhotoSat 2015), runoff and any seepage from the landfill will naturally flow to the Whale Tail WRSF Pond and then pumped to the Whale Tail Attenuation Pond for further treatment before discharge.

Further information on the management of this facility is described in the Landfill Design and Management Plan.

3.1.4.10 Sludge Management from Water Treatment Plant

Sludge water (typically with 2 to 3% of solid content) from the WTP will be discharged into the Whale Tail Attenuation Pond. The maximum predicted annual volume of sludge water from the WTP is approximately 26,280 cubic metres (m^3).

3.1.5 Freshwater and Sewage Water Management

3.1.5.1 Freshwater Management

Freshwater for the Whale Tail Camp will be sourced from Lake A17 (Whale Tail Lake) and from Lake C38 (Nemo Lake). Freshwater usage includes potable use, fire suppression, dust suppression, drilling water, if contact water is not available, and water for the truck shop. The freshwater source is Lake C38 (Nemo Lake) during construction and operations, and Lake A17 (Whale Tail Lake) during closure. Freshwater will also be required to refill Whale Tail Lake (North Basin) at closure and will be sourced from the Whale Tail Lake (South Basin), and inflows to Whale Tail Lake (North Basin). Agnico Eagle will endeavour to minimize the amount of freshwater required for the Project, where possible.

Freshwater will be sourced through a freshwater intake and pump system. The intake will consist of vertical filtration wells fitted with vertical turbine pumps that supply water on demand. The intake will be connected to the pump house with piping buried under a rockfill causeway. The intake pipe will exit at the bottom of the causeway and will be fitted with a stainless steel screen. The rockfill causeway will act as a secondary screen to prevent fish from becoming entrained. The stainless steel screens design for the water intake will be consistent the Fisheries and Oceans Canada (DFO) “Freshwater Intake End-Of-Pipe Fish Screen Guideline” (DFO 1995). As per the DFO policy intake screens will be cleaned every 2 years. The freshwater intake will be moved to Whale Tail Lake (North Basin) at closure.

Freshwater will be pumped to an insulated main storage tank located at the Whale Tail Camp. The freshwater pipeline will be a high density polyethylene pipe and insulated and heat traced. The Whale Tail Camp will have a WTP for potable (domestic) water. The design flow rate for the potable water for the Whale Tail Camp and accommodations (i.e., kitchen, laundry) is 84 cubic metres per day (m^3/day), based on a 350 people camp capacity, using both the existing Exploration Camp and additional 210 units and a nominal consumption of 240 litres per day per person (L/day/person). In the Potable WTP, the freshwater will first go through sand filters and then be pumped through ultraviolet units, and finally be treated with chlorine. The treated water will be stored within a potable water tank. Potable water will be monitored according to the Nunavut health regulations for total and residual chlorine and microbiological parameters. Treated potable water will be piped to other facilities requiring potable water.

Approximately 8,760 cubic metres per year (m^3/year) of freshwater will be required during the construction phase, 118,625 m^3/year during the operational phase, and 17,520 m^3/year during the closure phase. During closure, the Whale Tail Pit and Whale Tail Lake (North Basin) will be allowed to flood naturally with non-contact, treated, and freshwater from direct precipitation, runoff from adjacent land, and Whale Tail Lake (South Basin). It is anticipated that approximately 24,000,000 m^3 over 8 years is required to fill the mined-out Whale Tail Pit (i.e., approximately 17,000,000 m^3) and Whale Tail Lake (North Basin) (i.e., approximately 7,000,000 m^3) to its original level, including approximately 2,300,000 m^3/year from Whale Tail Lake (South Basin), 120,000 m^3/year from tributaries to Whale Tail Lake (North Basin), and 580,000 m^3/year from direct precipitation to Whale Tail Lake (North Basin).

3.1.5.2 Sewage Water Management

Sewage will be collected from the camp and change-room facilities and pumped to a STP. The objective of the STP is to treat sewage to an acceptable level for discharge to the Whale Tail Attenuation Pond via a sewage water discharge pipeline. The STP will be housed in a prefabricated (modular) structure located in the Whale Tail Camp. The sewage treatment system will be designed based on a flow rate of 200 L per day per room for a peak load of 210 rooms, for an average daily flow rate of 42 m^3 (1.75 cubic metres per hour [m^3/hour]). As already installed on site for the Exploration Camp, additional Bionest Kodiak biological reactor units are envisioned to be installed to treat camp waste water and accommodate for a total of 350 rooms.

The STP for the camp facilities will be designed to meet appropriate guidelines for wastewater discharge (for example, NWT Water Board 1992). Wastewater System Effluent Regulations (WSER) criteria are not currently applicable to systems located in Nunavut, and is unlikely to apply to the Project effluent quality. Table 3.5 provides the anticipated performance of the system compared to the WSER criteria.

Table 3.5 Anticipated Sewage Treatment Plant Treatment Performance

Parameter	WSER[1] (average concentration in the effluent)	STP Treatment Performance
Carbonaceous Biochemical Oxygen Demand	25 mg/L	10 mg/L
Total Suspended Solid	25 mg/L	10 mg/L
Total Residual Chlorine	0.02 mg/L (if chlorine used in treatment of waste water)	No chlorine to be used in treatment
Un-ionized ammonia	1.25 mg/L (expressed as nitrogen at 15°C ± 1°C	<10 mg/L NH4-N, which represents ~<0.03 mg/L un-ionized ammonia (at 15°C, pH 7)

[1] Waste Water System Effluent Regulations

WSER = Wastewater System Effluent Regulations; STP = Sewage Treatment Plant; mg/L = milligram per litre; °C = degrees Celsius; < = less than; ± = plus or minus.

3.2 Operation, Maintenance, and Surveillance of Project Dikes

3.2.1 Consequence of Failure

The consequence of failure classification is presented in SNC (2015) based on the guidelines provided in the Canadian Dam Association Dam Safety Guidelines (CDA 2014). The Whale Tail Dike and the Northeast Dike are rated as "High" consequence of failure structures, Mammoth Dike is rated as "Significant" consequence of failure structure, and Whale Tail WRSF Dike is classified as "Low" consequence of failure structure.

No flooding or inundation mapping has been completed.

It is assumed that failure of Whale Tail Dike and Northeast Dike could flood the Whale Tail Pit, resulting in associated threat to the safety of mine personnel, equipment, and other workings within the dewatered area. Flooding would likely cause cessation of mining operations within the pit, either temporarily or permanently.

It is assumed that failure of Mammoth Dike could not flood the Whale Tail Pit as the water level at Mammoth Dike is too low.

Finally, as the Whale Tail WRSF Pond will have a small volume and will continue to be pumped to the Whale Tail Attenuation Pond over the summer season, a low probability of failure is attributed to the Whale Tail WRSF Dike and then to the consequence of failure.

3.2.2 Operation, Maintenance, and Surveillance Manual

The Meadowbank Mine OMS manual will be updated by Agnico Eagle before the operations of the dikes, reviewed on an annual basis and revised as necessary to accommodate changes in the condition and operations of the facilities or in management structure as per requirements of the Type A Water Licence. The OMS Manual will be an extension of the existing Meadowbank OMS Manual (Agnico Eagle 2015b).

3.2.3 Role and Manual Holders

The Meadowbank Mine Engineering Superintendent will be responsible for delivering the first release of the OMS Manual as well as issue all revisions and addenda to the registered holders: General Mine Manager, Environment Superintendent, Mine Operations Superintendent, Engineering Superintendent, General Services Manager, Site Services Superintendent, Corporate Environment Director, Health and Safety Superintendent, and Dike Design Engineer. The role and responsibilities of holders will be revised when issuing the OMS Manual.

3.2.4 Dewatering

Based on SNC (2015), the design criteria for minimum freeboard for the dikes are presented in Table 3.6. The freeboard may change due to fluctuations in Whale Tail Lake and Ponds, or due to settlement

in the dikes. Maintenance may be required to restore loss of freeboard due to settlement. The freeboard may also change during further advanced engineering phases.

Table 3.6 Design Minimum Freeboard

Structure	Minimum Freeboard	
	Rockfill Structure (Dike Crest) (m)	Low Permeability Element (Cutoff Wall or Liner) (m)
Whale Tail Dike	3.0	2.0
Mammoth Dike	2.6	2.0
Whale Tail WRSF Dike	4.0	2.2
Northeast Dike	2.5	2.0

m = metre; WRSF = Waste Rock Storage Facility.

Based on past Vault Lake dewatering operations, where the WTP was not required because the Meadowbank Mine regulation criteria limit was reached most of the time but the WTP was used during the latter stages when TSS from bottom sediments were present, it is expected for the Project that approximately 2/3 of the dewatered water from the Whale Tail Lake (North Basin) will be pumped and directly discharged to Whale Tail Lake (South Basin) while the remaining 1/3 of the water will be processed through the WTP to reduce TSS and discharged to Lake A16 (Mammoth Lake) thru a diffuser. During new dike construction Agnico Eagle will abide by the NWB Type A Water Licence (No. 2AM-MEA0815) Part D Item 5 and 6; and the construction limits during the open water season outlined in Item 7 or other applicable licence conditions.

Pore water pressures in the foundation of the dewatering dikes will be monitored during dewatering as a predictor of possible slope instability. Both pore water pressures and temperature measurements will be monitored during dewatering as one method of detecting potential zones of seepage. The quantity of water pumped out during dewatering will be monitored with flow meters in addition to monitoring the water level downstream of the Lake A17 (Whale Tail Lake) watershed.

3.2.5 Operations

Water from the seepage collection systems of the dikes is to flow naturally to the Whale Tail Attenuation Pond or to the Open-Pit and the Collection Ponds and be pumped to the Whale Tail Attenuation Pond. The quantity of seepage through the dikes will be estimated on further advanced engineering phases. Seepage rates, volumes and the condition of the seepage water (i.e. turbidity, temperature, etc.) will be monitored according to the Type A Water Licence.

Water quality of the seepage and runoff collected in the sumps and ditches at the toe of the dikes is to be monitored during operations according to NWB Type A Water Licence 2AM-MEA1525 Part I Item 13. Weekly inspections will be performed as an indicator of dike performance to note whether seepage water is clear, cloudy or if fine material is present.

3.2.6 Surveillance

A program of regular surveillance is required to ensure that the dikes, instrumentation and seepage collection systems are performing adequately and that problems are detected so that the necessary corrective actions can be implemented in a timely manner. A surveillance program will be implemented based on the International Commission on Large Dams (ICOLD 1998) for detection of potential failure mechanisms applicable to the dikes, primarily Whale Tail Dike, Northeast Dike and Whale Tail WRSF Dike. The surveillance program for the Project will be implemented in the OMS Manual by Agnico Eagle before the operations of the dikes.

3.2.7 Monitoring and Instrumentation

Monitoring of the dikes will be carried out for the purpose of environmental monitoring, assessment of physical stability of the structures, assessment of overall performance of the dikes, and aiding in future design. Monitoring complements the surveillance and is divided into the following aspects: drawdown rate and water quality during dewatering, geotechnical instrumentation including piezometers, thermistors, inclinometers, survey prisms, etc., and seepage rates and water quality during operations. The monitoring program for the Project will be implemented in the OMS Manual by Agnico Eagle before the operations of the dikes.

3.2.8 Reporting Procedures and Data Management

Emergency, inspection, and instrumentation measurements will be reported according to the role and responsibility of individuals. An electronic library or database will be set up to catalogue and store inspection documents, maintenance reports and instrumentation measurements. Hard copies will also be catalogued and stored on site.

3.2.9 Decommissioning

The decommissioning of the dikes will take place progressively as the dikes are breached.

The Whale Tail Dike and the Mammoth Dike will remain intact during the controlled flooding of the Whale Tail Pit and Whale Tail Lake (North Basin). These are flooded gradually over the course of several years. Once the water levels have stabilized within Whale Tail Lake (South Basin) and Whale Tail Lake (North Basin) and water quality is considered acceptable for mixing with neighbouring lakes, these two dikes will be decommissioned to allow circulation of lake water.

The Northeast Pond will be draw-down into the open-pit before the dike be decommissioned.

The Whale Tail WRSF Dike will remain in place during closure and post-closure period or until the water quality monitoring results meet discharge criteria to allow water to naturally flow to the receiving environment. Following confirmation the water quality monitoring results meet discharge criteria the Whale Tail WRSF Dike will be decommissioned.

Long-term inspection will be carried out to ensure the adequate performance of maintained closure and post-closure facilities.

3.2.10 Emergency Preparedness Plan

The purpose of an Emergency Preparedness Plan is to present a basic procedure for responding to potential failure mechanisms for dikes. The procedure identifies various measurable or observable effects or causes of the failure mechanisms, identifies the appropriate people to notify, presents the procedure to put in place according to the level of emergency and lists the response reference. The Emergency Preparedness Plan for the Project will be implemented in the OMS Manual by Agnico Eagle before the operations of the dikes.

3.3 Water Management during Closure

Mine closure is integral to the mine design and will be modified during operations. Planning for permanent closure is an active and iterative process. The intent of the process is to develop a final Plan using adaptive management. This begins during the mine design phase and continues through to closure implementation. Adaptive management enables the Plan to evolve as new information becomes available through analysis, testing, monitoring, and progressive reclamation. The detailed mine closure and reclamation activities are provided in the Whale Tail Pit Interim Closure and Reclamation Plan.

Water management during closure and reclamation will involve maintaining contact water management systems on site until monitoring results demonstrate that water quality is acceptable for discharge of all contact water to the environment without further treatment. Once water quality meets the discharge criteria, the water management systems will be decommissioned to allow the water to naturally flow to the receiving environment.

The key water management activities during mine closure are summarized in Table 3.7. Figure B.2 to Figure B.4 in Appendix B show the water management flowsheets during mine closure phases.

Table 3.7 Key Water Management Activities during Mine Closure

Mine Year	Figure	Key Water Management Activities and Sequence
Year 4 (2022) to Year 7 (2025)	A.3	• Fill the mined-out open pit with active pumping of water from Whale Tail Lake (South Basin) and treated Whale Tail WRSF pond water • Draw-down of the raised Northeast Sector and breaching of the Northeast Dike. The Northeast Pond water flows in the open pit and Lake A47, Lake A48, Lake A113, Pond A-P38, and A-P68 return to their natural water level and drainage patterns • Water from the A watershed stops to flow in the C watershed • Water from Whale Tail Lake (South Basin) stops flow through Whale Tail Lake (South Basin) Diversion Channel and to Lake A16 (Mammoth Lake) • Draw-down of the raised Whale Tail Lake (South Basin) to natural water level by pumping to Whale Tail Lake (North Basin). Lake A55, Lake A65, Lake A62, Lake A63, Lake A18, Pond A-P23, Lake A20, Lake A21, Lake A22, and Lake A45 return to their natural water level and drainage patterns. • The freshwater intake is moved in Whale Tail Lake (South Basin) • The monitoring of the site water quality starts • If necessary, the WTP is moved in the Whale Tail WRSF sector
Year 8 (2026) to Year 11 (2029)	A.4	• Fill Whale Tail Lake (North Basin) with active pumping water from Whale Tail Lake (South Basin). The pumping rate will be equivalent to the natural inflow to Whale Tail Lake (South Basin) to keep a constant and natural water level in Whale Tail Lake (South Basin) • The Whale Tail Attenuation Pond as well as the Industrial Sector and the Whale Tail Camp are no longer considered as contact water and now contribute to the re-establishment of the natural water level of the Whale Tail Lake (North Basin) • Whale Tail Dike and Mammoth Dike are breached when i) the South side and the North side of the Whale Tail Dike are at the same water level (i.e., at natural water level) and ii) the water quality monitoring results meet discharge criteria to allow water to naturally flow to the receiving environment Remove non-essential site infrastructure
Post-Closure	N/A	• Treated contact water from the Whale Tail WRSF Sector is discharged in Lake A16 (Mammoth Lake) through the existing diffuser system. This water is treated until water quality meet direct discharge criteria, following which the water management system is decommissioned • Breach the Whale Tail WRSF Dike once water quality monitoring results meet discharge criteria to allow water to naturally flow to the receiving environment • Remove non-essential site infrastructure

WRSF = Waste Rock Storage Facility; N/A = not applicable.

3.3.1 Open Pit and Refilling of Whale Tail Lake (North Basin)

Following completion of mining, the open pit will be filled with natural runoff and water pumped from Whale Tail Lake (South Basin) and treated water from the Whale Tail WRSF. During the summer of the Year 4 (2022), the water accumulated in Whale Tail Lake (South Basin) over the years of operations

will be pumped in the open pit. It will take approximately 4 years to refilling the pit with an assumed pumping rate of 45,000 m^3/day. Following this first pumping summer, the water elevation in Whale Tail Lake (South Basin) will be back to the baseline value (152.5 masl) and no outlets will be available for this basin as the Whale Tail Lake (South Basin) Diversion Channel is at the elevation 156 masl and the Whale Tail Dike is maintained in place. During the following years and until Whale Tail Lake (North Basin) reaches the same water elevation as Whale Tail Lake (South Basin) (i.e., baseline water surface elevation of 152.5 masl), the yearly accumulated water in Whale Tail Lake (South Basin) (i.e., over the baseline water surface elevation of 152.5 masl) is pumped to Whale Tail Lake (North Basin). At an assumed pumping rate of 45,000 m^3/day, the north and south parts of the Lake A17 (Whale Tail Lake) will be at the same elevation 8 years after the end of the operational phase and then the Whale Tail Dike and the Mammoth Dike will be breached when the water quality monitoring results meet discharge criteria to allow water to naturally flow to the receiving environment.

The walls of the open pit will have been exposed for a number of years during the operational phase, and some weathering may have occurred. As the pit floods, the water will contact the weathered rocks, which may affect the water quality by increasing concentrations of dissolved metals (Volume 6, Appendix 6-H). The water quality model results indicated that the concentration of arsenic in the flooded pit may slightly exceed the aquatic life guideline (CCME 1999) and drinking water guideline (Health Canada 2014), and the concentration of phosphorus may be above the mesotrophic trigger value (CCME 2004). No exchanges are modelled between the Whale Tail Pit water and the overlying water in Whale Tail Lake (North Basin) (Volume 6, Appendix 6-H). As per NWB Type A Water Licence 2AM-MEA1525 Part E Item 7 and 8 requirements, a site wide water balance will be updated as part of the annual water management plan and end pit water quality modelling will be conducted to update these predictions.

3.3.2 Contact Water Collection System

The complete contact water collection system will remain in place to collect surface runoff water and seepage from the mine site until the open pit is flooded. During this period of 4 years, the Industrial Sector and the Whale Tail Camp will be reclaimed and the non-essential site infrastructure will be removed. Thereafter, water in these sectors will no longer be collected and will contribute to the reestablishment of the natural elevation of Whale Tail Lake (North Basin). Although water might not meet the discharge criteria after 4 years, water will be controlled as the Whale Tail Dike and the Mammoth Dike will remain in place until Year 11 of the Project. In the Whale Tail WRSF Sector, the contact water collection system will remain in place. As per NWB Type A Water Licence 2AM-MEA1525 Part E Item 7, the shall not breach dikes until the water quality in the flooded area meets Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines, baseline concentrations or appropriate site specific water quality objectives.

Dike breaching will involve the removal of a portion of the dike to original ground levels. Consideration will be given to breach staging, with the above water portions of the dike/berm in the breach area removed during winter periods, when there will be little surface water flow, thereby minimizing the

potential release of sediments to the neighbouring waterbodies. The remainder of the breach would be completed during the open water season following freshet so as to allow for the deployment of Turbidity Curtains to control potential releases of sediment.

Channel and sump closure involve the infrastructure will be re-contoured and/or surface treated according to site-specific conditions to minimize wind-blown dust and erosion from surface runoff, if required. This closure activity is intended to enhance site area development for re-colonization by native plants and wildlife habitat.

3.4 Water Balance

A water balance model was developed to assist in the evaluation of the proposed water management infrastructure, and estimation of the pumping requirements over the life of the mine (SNC 2015) and under closure conditions (Whale Tail Interim Closure and Reclamation Plan).

The water balance was computed on a monthly time step based on mean annual climate conditions (Section 2.1.1) and the following conservative assumptions:

- snow sublimation is subtracted from snowfall on a monthly basis. If snow sublimation is greater than snowfall for a particular month, net snow value us zero for that month;
- snowfall between October and May, net of snow sublimation and rainfall, accumulates as snow and ice, and melts entirely in June;
- runoff is composed of precipitation and snow melt during the summer months (June to September);
- net inflow for a lake or pond is computed as runoff minus evapotranspiration (computed based on the watershed area minus lake or pond area) and lake evaporation (computed based on the lake or pond area); and
- change in storage was not accounted for, and net inflow is equal to net outflow.

The water management flow sheets are presented in Appendix B, and water balance results are presented in Appendix C for mean annual climate conditions during operations.

The estimated mean annual water input/output from each of various water management facilities under mean annual climate conditions during operations are summarized in Table 3.8.

Table 3.8 Estimated Mean Annual Volumes from Mine Site Water Balance

Item	Mean Annual Water Volume (m^3)[1]
Whale Tail Attenuation Pond	455,000
Whale Tail WRSF Contact water to Pond	112,000
Open Pit inflows	111,000
Freshwater Pumped from Lake C38 (Nemo Lake)	74,000
Treated Water from WTP to be Discharged to the Receiving environment	420,000
Freshwater Diverted from Watershed A to Watershed C	207,000
Freshwater from Whale Tail Lake (South Basin) to Lake A16 (Mammoth Lake)	1,873,000

[1:] Volume rounded to the nearest thousand.

WRSF = Waste Rock Storage Facility.

SECTION 4 • REFERENCES

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APPENDIX A • YEARLY SITE LAYOUT PLANS