AGNICO EAGLE

Meadowbank Division

WHALE TAIL PIT

Water Management Plan

MAY 2019
VERSION 4_NWB

EXECUTIVE SUMMARY

Agnico Eagle Mines Limited – Meadowbank Division (Agnico Eagle) is proposing an expansion to the Whale Tail Pit and Haul Road Project (Approved Project), a Meadowbank satellite deposit located on the Amaruq property. As an expansion to the Approved Project (Project Certificate No. 008 and Type A Water Licence 2AM-WTP1826) Agnico Eagle is proposing to expand and extend the Whale Tail Pit operations (the Expansion Project or the Project) to include a larger Whale Tail Pit, development of the IVR Pit, and underground operations while continuing to operate and process ore at the Meadowbank Mine.

The Amaruq property is a 408 square kilometre (km^2) site located on Inuit Owned Land (IOL) approximately 150 kilometres (km) north of the hamlet of Baker Lake and approximately 50 km north of Meadowbank Mine in the Kivalliq Region of Nunavut. The deposit would be mined as two open pits (i.e., Whale Tail Pit and IVR Pit) and underground operations, and ore will be hauled to the approved infrastructure at Meadowbank Mine for milling.

The Whale Tail Pit Project (Approved Project), mined by truck-and-shovel operation, will produce 8.3 million tonnes (Mt) of ore, 46.1 Mt of waste rock, and 5.6 Mt of overburden waste, processed over a three to four-year mine life. The Expansion Project proposes mining an additional 15.2 Mt of ore from the expanded Whale Tail Pit, the IVR Pit and underground operations. This expanded resource will be extracted over approximately four year period. In total, the resources for the Whale Tail project will be expanded and extended over approximately an seven year period from 2019 to 2025.

The water management objectives are to minimize potential impacts to the quantity and quality of surface water at the mine site. The water management system includes contact water collection ponds, freshwater collection ponds, diversion channels, retention dikes, dams, culverts, water treatment plants for effluent, potable water treatment plant, sewage treatment plant, and discharge diffusers. Water management structures will be constructed, dependent on the potential presence and volume of water, to contain and manage the contact water from the areas affected by the mine or mining activities.

Consistent with the Approved Project, the main objectives pertaining to water management for the Expansion Project are to limit and/or stop the flow of surface water runoff in the pit and to limit the impact on the local environment. In developing the water management plan, the following principles were followed:

- 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 and process water to the extent practical; and

- meet discharge criteria before any site contact water is released to the downstream environment.

The Project site was divided into several management areas including contact water areas and non-contact water areas. Contact water will be collected in several ponds or sumps and pumped to attenuation ponds before being treated and discharged directly or indirectly (i.e., through Whale Tail Lake [South Basin]) into Mammoth Lake. Non-contact water will be rerouted or discharged directly into the environment without treatment.

Any water requiring treatment will be pumped to the water treatment plants prior to discharge through the diffuser in Mammoth Lake or through a diffuser in Whale Tail Lake (South Basin) or other alternatives.

During operations when the mine is at its maximum footprint, the conservative predictions of future water quality indicate that most parameter concentrations in the downstream environment are below CEQG-AL except for arsenic. A site wide water balance will be updated on a regular basis and end pit water quality modelling will be conducted as needed to update predictions.

Water management during closure and reclamation will involve actively filling the underground facilities and IVR Pit, and passively allowing the Whale Tail Attenuation Pond and the Whale Tail Pit to flood. The Groundwater Storage Ponds, and IVR Attenuation Pond will be emptied at the start of closure and backfilled with NPAG/non-ML waste rock. The Whale Tail and IVR WRSFs will be progressively covered with NPAG/non-ML waste rock throughout operations and are expected to be completely covered at the beginning of closure. Contact water management systems will remain 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.

This plan has been updated for the Expansion Project in support of the Nunavut Water Board (NWB) Type A Water License Amendment Process.

DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
1	January 2017			Water Management Plan for the Whale Tail Pit	Agnico Eagle Meadowbank Division and Golder Associates Ltd.
2	September 2018	All	All	Water Management Plan for the Whale Tail Pit	Agnico Eagle Meadowbank Division and SNC-Lavalin inc.
3	October 2018	3.1.4.11 3.3.1	23 32	Updated to align with recommendations issued by CIRNAC, ECCC and KIA in October 2018	Agnico Eagle Meadowbank Division
4_NIRB	November 2018	All	All	Water Management Plan for the Whale Tail Pit – Expansion Project	Agnico Eagle Meadowbank Division and SNC-Lavalin inc.
4_NWB	May 2019	All	All	Water Management Plan for the Whale Tail Pit – Expansion Project	Agnico Eagle Meadowbank Division and SNC-Lavalin inc.

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ACRONYMS

Agnico Eagle	Agnico Eagle Mines Limited – Meadowbank Division
Approved Project	Whale Tail Pit and Haul Road
ARD	Acid Rock Deposition
CCME	Canadian Council of Ministers of the Environment
DFO	Department of Fisheries and Oceans Canada
Expansion Project	Whale Tail Pit – Expansion Project
FEIS	Final Environmental Impact Statement
IOL	Inuit Owned Land
LOM	Life of Mine
NIRB	Nunavut Impact Review Board
NWB	Nunavut Water Board
OMS	Operation, Maintenance, and Surveillance
PGA	Peak Ground Acceleration
Plan	Water Management Plan
STP	Sewage Treatment Plant
TSF	Tailings Storage Facility
TSS	total suspended solids
WRSF	Waste Rock Storage Facility
WSER	Wastewater System Effluent Regulations
WTP	Water Treatment Plant

UNITS

±	plus or minus
<	less than
%	percent
°C	degrees Celsius
°C/m	degrees Celsius per metre
km	kilometre(s)
km^2	kilo square metre(s)
L/day/person	litres per person per day
masl	metre(s) above sea level
mbgs	metre(s) below ground surface
mg/L	milligrams per litre
m	metre
mm	millimetre
m^3	cubic metre(s)
m^3/day	cubic metres per day
m^3/hour	cubic metres per hour
m^3/year	cubic metres per year
Mm^3/year	million cubic metre(s) per year
Mm^3	million cubic metre(s)
t	tonne
Mt	million tonne(s)

SECTION 1 • INTRODUCTION

Agnico Eagle Mines Limited – Meadowbank Division (Agnico Eagle) is proposing an expansion to the Whale Tail Pit and Haul Road Project (Approved Project), a Meadowbank satellite deposit located on the Amaruq property. As an expansion to the Approved Project (Project Certificate No. 008 and Type A Water Licence 2AM-WTP1826) Agnico Eagle is proposing to expand and extend the Whale Tail Pit operations (the Expansion Project or the Project) to include a larger Whale Tail Pit, development of the IVR Pit, and underground operations while continuing to operate and process ore at the Meadowbank Mine.

The Amaruq property is a 408 square kilometre (km^2) site located on Inuit Owned Land (IOL) approximately 150 kilometres (km) north of the hamlet of Baker Lake and approximately 50 km north of Meadowbank Mine in the Kivalliq Region of Nunavut. The deposit would be mined as two open pits(i.e., Whale Tail Pit and IVR Pit) and underground operations, and ore will be hauled to the approved infrastructure at Meadowbank Mine for milling.

The Whale Tail Pit mine (Approved Project), mined by truck-and-shovel operation, will produce 8.3 million tonnes (Mt) of ore, 46.1 Mt of waste rock, and 5.6 Mt of overburden waste, processed over a three to four-year mine life. The Expansion Project proposes mining an additional 15.2 Mt of ore from the expanded Whale Tail Pit, the IVR Pit and underground operations. This expanded resource will be extracted over approximately four year period. In total, the resources for the Whale Tail project will be expanded and extended over approximately an eight year period from 2019 to 2026.

The construction and preparation of material for the Approved Project started in summer 2018 after all permits and authorizations were received and construction of the dikes has started in the third quarter of Year -1 (2018). Focus on site preparation and construction of infrastructure, with the development of the open-pit to produce construction material will continue in 2018. During this first phase, waste rock and overburden will be piled in the Whale Tail Waste Rock Storage Facility (Whale Tail WRSF) and ore stockpiled on the ore pads. The approved Whale Tail WRSF will continue to be used for the Whale Tail Pit expansion and the facility will be expanded vertically and horizontally to the southeast. The Expansion Project includes a new IVR WRSF to accommodate waste rock and overburden generated from the IVR Pit. The waste rock storage footprint, water management infrastructure and camp have been designed and considers up to eight years to allow for expected resource growth. The Underground WRSF (AP-5 location) that is permitted under the Type B will be expanded and become a facility regulated under the Type A Watr Licence (2AM-WTP1826). Agnico Eagle will increase the footprint of the underground exploration area to the north to accommodate additional waste storage. The existing tailings facility at Meadowbank Mine will continue to be used for tailings disposal. All tailings treatment and disposal will remain consistent with the current Project Certificate (No. 004). Closure will occur from Year 8 (2026) to Year 24 (2042) after the completion of mining and will include removal of the non-essential site infrastructure and flooding of the mined-out open pits and underground mine as well as refilling of Whale Tail Lake (North Basin). Only essential

infrastructure related to water treatment will remain on site during the closure. Accordingly, in addition to the Water Treatment Plant (WTP), a part of the camp, including all infrastructure allowing camp autonomy and security, as well as site roads, will be maintained following the operational phase (see more information in Whale Tail Pit Interim Closure and Reclamation Plan). Post-closure is expected from Year 24 (2042) forwards. Site and surrounding environment monitoring will start from the beginning of the construction and be completed during the post-closure phase when it is shown that the site and water quality meets the regulatory closure objectives. Table 1.1 summarizes the overview of the timeline and general activities.

Table 1.1 Overview of Timeline and General Activities

Phase	Year	General Activities
Construction	Year -1	• Construct site infrastructure • Develop open pit mine • Stockpile ore
Operations	Year 1 to 7	• Open pits operations • Underground operations • Transport ore to Meadowbank Mine • Stockpile ore • Discharge Tailings in Meadowbank TSF
	Year 8	• Complete transportation of ore to Meadowbank Mine • Complete discharge tailings in Meadowbank TSF
Closure	Year 8 to 24	• Remove non-essential site infrastructure • Flood mined-out open pits and underground operations • Re-establish natural Whale Tail Lake level
Post-Closure	Year 24 forwards	• Site and surrounding environment monitoring

TSF = Tailings Storage Facility

This document presents the Water Management Plan (Plan) for the Expansion Project. As an expansion to the existing operations at Whale Tail Pit, the proposal is subject to an *Environmental Assessment reconsideration established by the Nunavut Planning and Project Assessment Act* (NuPPA) and the *Water Licence authorities under the Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA). Agnico Eagle requests the NWB the amendment of the Water License Type A 2AM-WTP1826 where appropriate to include the Expansion Project.

Agnico Eagle has applied the same water management and water balance approach in this document as used for the annual Meadowbank Mine Water management report (Agnico Eagle, 2015a and 2018). The purpose of this Plan is to provide consolidated information on water management, required water management infrastructure and water balance for the operations of Expansion Project as a satellite pit for the Meadowbank Mine. This plan has been updated for the Expansion Project in support of the Nunavut Water Board (NWB) Type A Water License Amendment Process. In addition, this Plan will be updated as required to reflect any changes in operations or economic feasibility occurs, and to incorporate new information and the latest technology, where appropriate.

SECTION 2 • BACKGROUND INFORMATION

2.1 Site Conditions

The general mine site location for the Expansion Project is presented in Figure 2-1.

2.1.1 Climate

Climate characteristics presented herein were extracted from the permitting level engineering report (SNC 2015).

The Expansion Project is located in an arid arctic environment that experiences extreme winter conditions, with an annual mean temperature of -11.3 degrees Celsius (°C). The monthly mean temperature ranges from -31.3°C in January to 11.6°C in June, with above-freezing mean temperatures from June to September. The annual mean total precipitation at the Expansion Project is 249 millimetres (mm), with 59 percent (%) of precipitation falling as rain, and 41% falling as snow. Mean annual losses were estimated to be 248 mm for lake evaporation, 80 mm for evapotranspiration, and 72 mm for sublimation. Mean annual temperature, precipitation, and losses characteristics are presented in Table 2.1. Short-duration rainfall, representative of the Expansion Project are presented in Table 2-2, based on intensity-duration-frequency curves available from the Baker Lake A meteorological station (Station ID 2300500) operated by the Government of Canada (2015).

Figure 2.1 Location of the Expansion Project

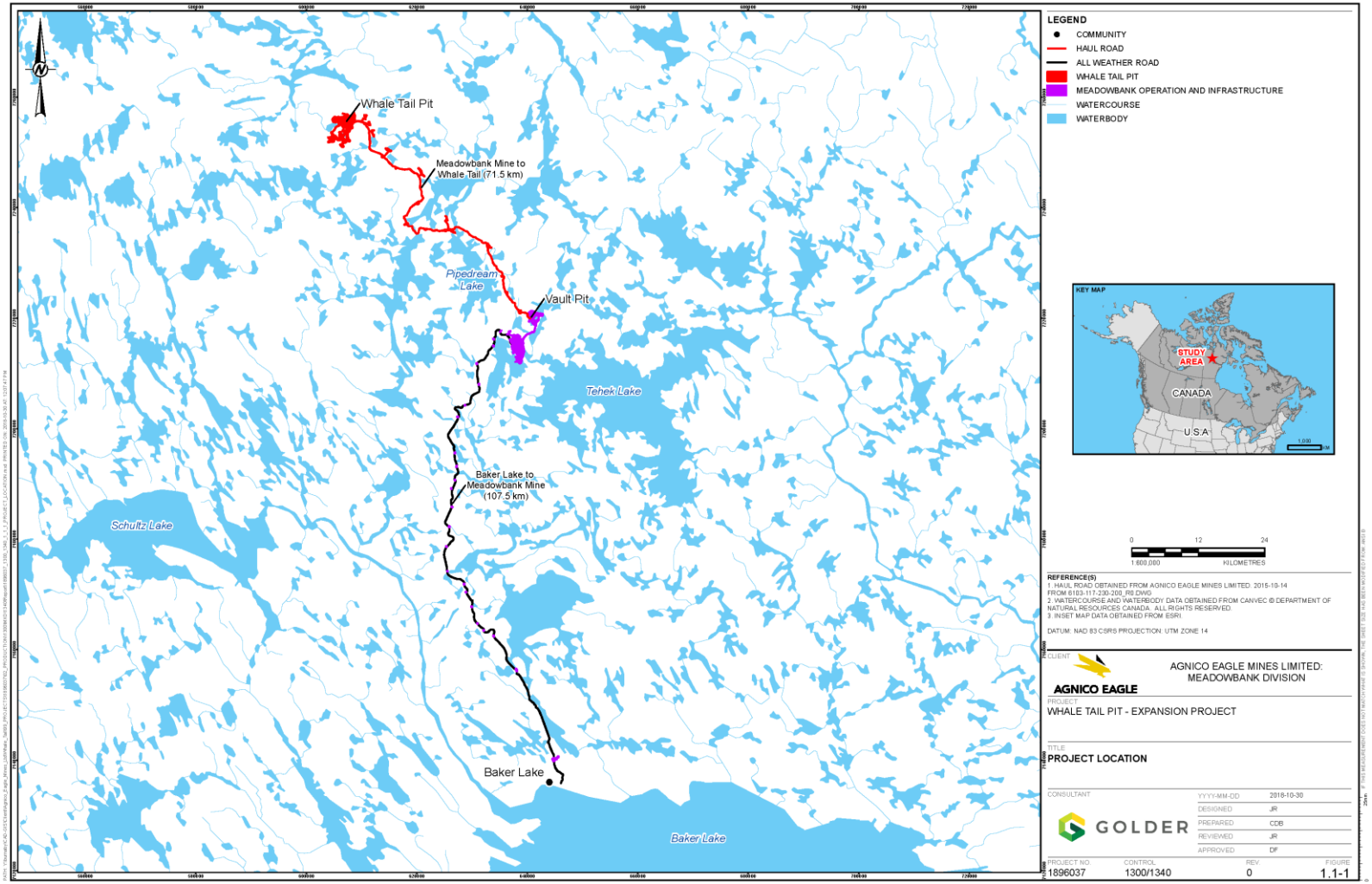


Table 2.1 Estimated Mine Site Monthly Mean Climate Characteristics

Month[a]	Mean Air Temp. (°C) [a]	Monthly Precipitation (mm) [a]			Losses [a]		
		Rainfall (mm)	Snowfall Water Equivalent (mm)	Total Precip. (mm)	Lake Evap. (mm)	Evapo-transpiration (mm)	Snow Sublimation (mm)
January	-31.3	0	7	7	0	0	9
February	-31.1	0	6	6	0	0	9
March	-26.3	0	9	9	0	0	9
April	-17.0	0	13	13	0	0	9
May	-6.4	5	8	13	0	0	9
June	4.9	18	3	21	9	3	0
July	11.6	39	0	39	99	32	0
August	9.8	42	1	43	100	32	0
September	3.1	35	7	42	40	13	0
October	-6.5	6	22	28	0	0	9
November	-19.3	0	17	17	0	0	9
December	-26.8	0	10	10	0	0	9
Annual	-11.3	146	103	249	248	80	72

[a] SNC (2015).

°C = degrees Celsius; mm = millimetre.

Table 2.2 Estimated Mine Site Extreme 24-Hour Rainfall Events

Return Period (Years) [a]	24-hour Precipitation (mm) [a]
2	27
5	40
10	48
25	57
50	67
100	75
1000	101

[a] SNC (2015).

mm = millimetre.

2.1.2 Permafrost and Hydrogeology

2.1.2.1 Permafrost Conditions and Assessment

Since the completion of the Approved Project, thermal assessments have been completed to contribute to the understanding of the permafrost conditions near the Whale Tail Pit, IVR Pit and Underground. An update of the Whale Tail Thermal Assessment was conducted in April 2019 (Golder 2019b). The thermal assessment evluated existing permafrost characteristics in the Whale Tail Lake and Project area and existing talik conditions under the Whale Tail Lake adjacent to the Project. The thermal assessment was completed based on available thermistor data to date, as well as the results of a thermal 2D modelling exercise and 3D block model prepared to assess permafrost conditions and the extent of talik formations beneath the Whale Tail Lake.

The updated thermal assessment of the project also took into consideration the groundwater monitoring program (Westbay sampling) that toock place in November 2018 (Golder 2019b). The 2018 groundwater monitoring program indicates that water samples were collected from fixed ports along the Westbay system between 276 m and 499 m below the ground surface, which suggests that the Westbay system is installed in open talik, or water sampling would not have been possible in depth.

Based on the results of the updated thermal assessment, the mine site is located in an area of continuous permafrost, as shown on Figure 2.2. The depth of permafrost at the mine site is estimated to be in the order of 452 metres (m) outside of the influence of waterbodies. The depth of the permafrost and active layer will vary based on proximity to the lakes, overburden thickness, vegetation, climate conditions, and slope direction. The typical depth of the active layer is 2 m in this region of Canada The estimated depth of zero amplitude from the temperature profiles ranges from 18 m to 35 m.The temperatures at the depths of zero amplitude are in the range of -3.1 °C to -8.6 °C for on land thermistors and 2.7 °C for AMQ17-1265A. The geothermal gradient estimated based on the lowest 70 to 100 m of the thermistor strings is in the range of 0.004 °C/m (AMQ15-294) to 0.052 °C/m. Late-winter ice thickness on freshwater lakes is approximately 2.0 m. Ice covers usually appear by the end of October and are completely formed in early November. The spring ice melt typically begins in mid-June and is complete by early July.

The information presented in the following section is based on the updated *Hydrogeological Assessment and Modelling Whale Tail Pit - Expansion Project* report (Golder 2019e). The following summarizes the updated understanding of permafrost conditions in the Expansion Project Area:

- The depth of permafrost outside of the influence of lakes is estimated to be between 452 m and 522 m based on thermal gradients and ground temperatures at the lowest portions of the thermistor strings. The depth of permafrost increases with increasing distance from lakes with talik.
- Considering the 2D thermal modelling and 3D block model, the assessment indicated that:

- Under the northern portion of the lake below Whale Tail Pit, there is likely a closed talik formation (Section C of the thermal modelling report, reproduced on Figure 3 of this report).
- Open talik conditions are probable in the southern portion of the lake where the Whale Tail Lake becomes wider (Section G of the thermal modelling report, reproduced on Figure 4 of this report).
- Permafrost depth is between 480 m and 550 m for ground away from the Whale Tail Lake, and between 350 m and 450 m below surface in portions beneath the Whale Tail Lake where a closed talik is present.
- The cryopeg thickness is likely between 20 m to 30 m.

2.1.2.2 Groundwater Flow Regime

Groundwater characteristics at the mine site are detailed in the Expansion Project Final Environmental Impact Statement (FEIS), Addendum Volume 6, Section 6.3. The hydrogeological lmodel was updated in May 2019 with hydrogeological modelling completed for the Expansion Project since submission of the FEIS addendum in December 2018 (Golder 2019e). The model was updated based on results of monitoring at the Westbay system in November 2018, supplemental packer testing in December 2018, and additional 2D and 3D thermal analysis in 2019. The updated hydrogeological model was then used to provide revised predictions of groundwater inflow and total dissolved solids (TDS) concentrations during dewatering, mining, pit and underground flooding, and long-term post-closure (reflooded) conditions

Two groundwater flow regimes occur at the Expansion Project: a deep groundwater flow regime beneath permafrost and a shallow groundwater flow system located in the active (seasonally thawed) layer near the ground surface. Except for areas of taliks beneath lakes, the two groundwater regimes are isolated from one another by thick permafrost.

Groundwater flow within the deep groundwater flow regime is limited to the sub-permafrost zone. This deep groundwater flow regime is connected to ground surface by open taliks underlying larger lakes. The elevations of these lakes are the primary control of groundwater flow directions in the deep groundwater flow regime, with density gradients providing a potential secondary control. The elevations of these lakes in the baseline study area indicate that Whale Tail Lake is likely a groundwater discharge zone at the south end of the Lake, with flow from Lake A60 to Whale Tail Lake, and a groundwater recharge zone at the north end of the Lake, with flow from Whale Tail Lake to Lake DS1 (Figure 2-3).

While portions of both Whale Tail Pit and the Underground are located within unfrozen rock, the IVR Pit is fully contained within permafrost. Groundwater inflow is therefore only expected during operations in the Whale Tail Pit and Underground.

Mining of the Whale Tail Pit occurs within the talik underlying Whale Tail Lake, whereas the Underground starts in permafrost and then extends below the permafrost into the deeper bedrock flow system. The Underground is not directly connected to either Whale Tail Pit or IVR Pit.

During mining, the Whale Tail Pit and Underground will act as a sink for groundwater flow, with seepage faces developing along the portions of the pit walls and Underground located in unfrozen rock. In response to the deepening of the mine workings, groundwater will be induced to flow through bedrock to the Whale Tail Pit and the Underground. Mine inflow will originate primarily from Whale Tail Lake (South Basin), the Whale Tail Attenuation Pond, and deep bedrock underlying the permafrost. During mining, upward migration of brackish groundwater, with higher TDS concentrations from beneath the mine, will occur. The quality of mine inflow will be a result of the mixing of groundwater from each of these sources.

Figure 2.2 Permafrost Map of Canada

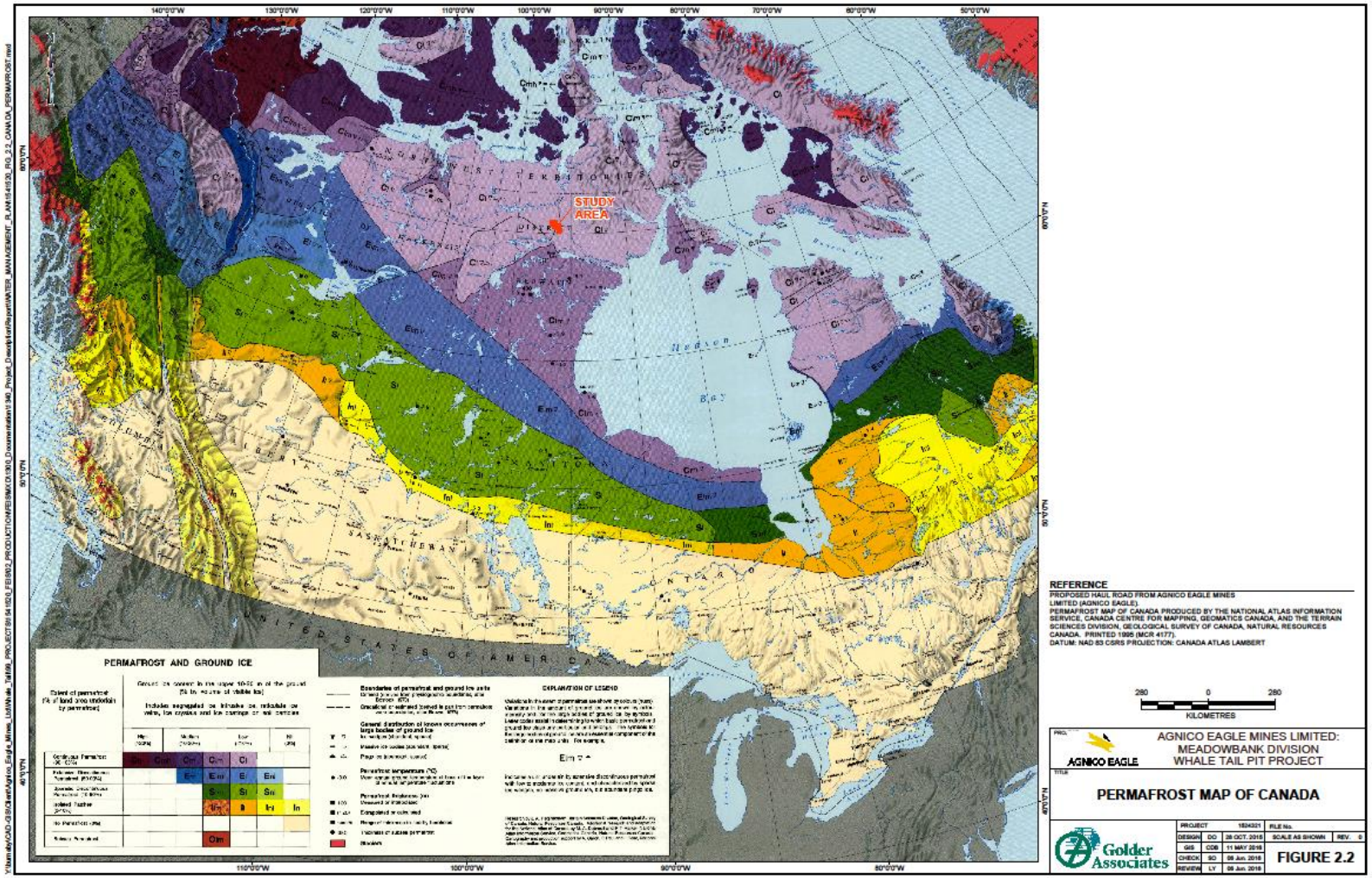
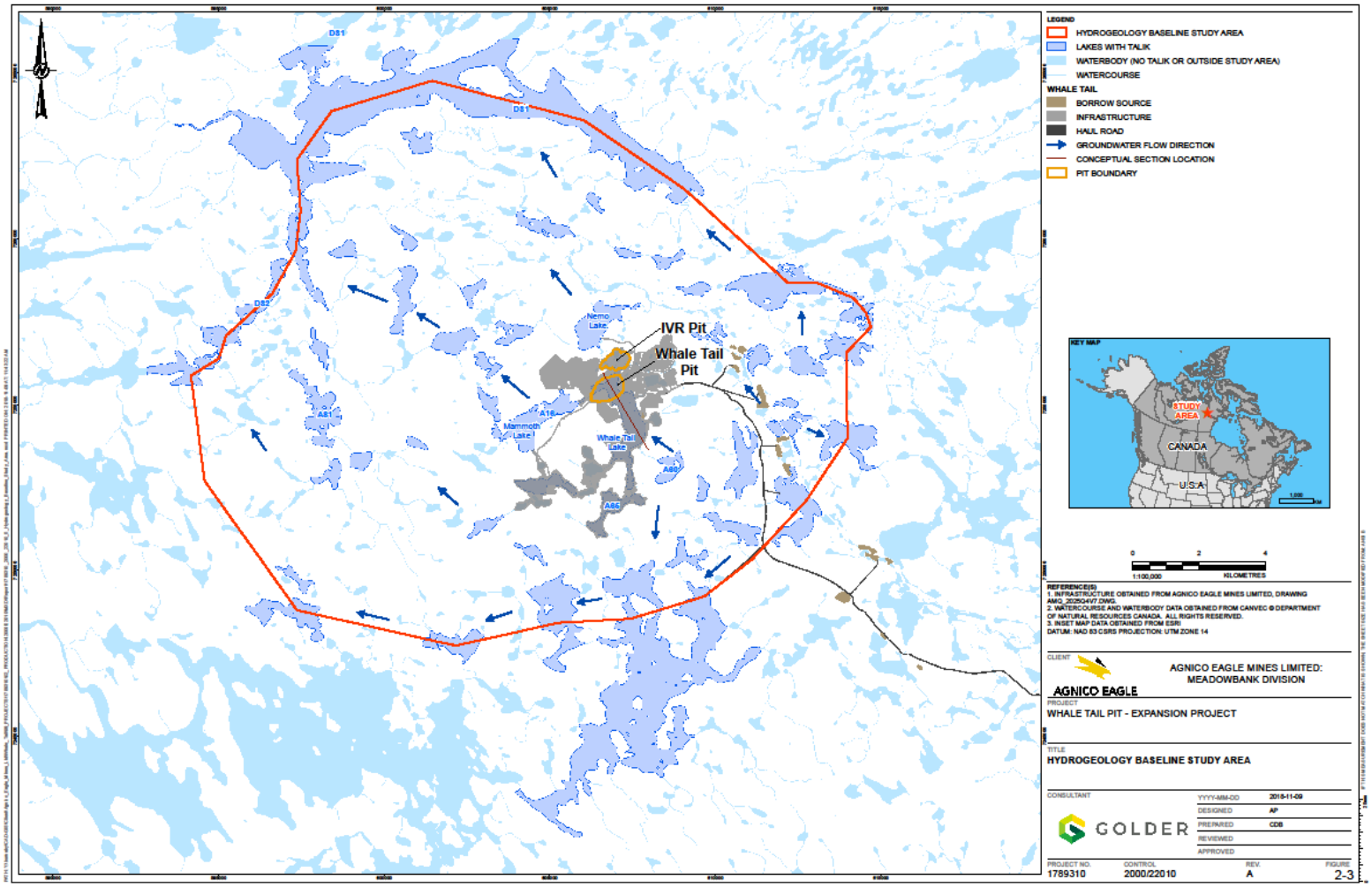


Figure 2.3 Hydrogeology Baseline Study Area



2.1.3 Hydrology

Hydrology characteristics were extracted from surface water quantity impact assessment section (Addendum 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 Expansion 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 (Approved Project FEIS, Volume 6, Appendix 6-G, Agnico Eagle, 2016) and the water quality impact assessment section (Approved Project FEIS, Volume 6, Section 6.4, Agnico Eagle, 2016). 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 (Addendum 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 located 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, IVR Pit and Underground mining will be mined using traditional open pit method and long hole mining (95 %) with some mechanized cut and fill in flat areas. The mining is planned from 2019 to 2026.

The Approved and Expansion Project will generate approximately 23.5 Mt of tailings, 167.8 Mt of mine waste rock, and 11.3 Mt of overburden soil, with very limited organic material . Consistent with the Approved Project, ore will be stockpiled in a series of stockpiles located adjacent to the pits. As ore is transported to the Meadowbank Mine for processing, a third mine waste stream, tailings, will be produced at Meadowbank Mine (Refer to the Meadowbank Tailings Storage Facility Management

Plan for Whale Tail Pit). The operation management and monitoring of the TSF is regulated under Agnico Eagle Type A water Licence 2AM-MEA1526.

The mine development will include the following major infrastructure:

- industrial area (camp, power plant, heli-pad, landfarm and garage);
- crusher;
- ore stockpiles;
- rock and Overburden Storage facilities;
- landfill;
- haul and access roads;
- underground mine; and
- two open pits 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 Whale Tail Pit Waste Rock Management Plan (Aginco Eagle 2019). Water management associated with mine waste management is described in Section 3.1.4 of this document. Two areas were identified as the Whale Tail and IVR WRSF to store waste rock and overburden material, as shown 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	11.3Mt	• Temporary storage West of Whale Tail Lake (~ 0.1 Mt for operations) • Co-disposed with waste rock in Whale Tail WRSF
Waste Rock	167.8Mt	• Construction material • Expansion Project WRSFs • Underground backfill material • Closure and site reclamation
Tailings	23.5 Mt	• As slurry tailings placed in the approved Meadowbank Mine tailings storage facility

WRSFs = Waste Rock Storage Facilities; 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

Consistent with the Approved Project, the main objectives pertaining to water management for the Expansion Project are to limit and/or stop the flow of surface water runoff in the pit and to limit the impact on the local environment. 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 and process 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 surface water Management 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 pits and in low points surrounding the open pits. Contact water will be diverted and collected in various sumps and water collection ponds and conveyed to an Attenuation Pond. Two attenuation ponds are planned for surface water and include the approved Whale Tail Attenuation Pond and the IVR Attenuation Pond at Lake A53 to support the Expansion Project operational activities.
- The addition of the IVR Attenuation Pond will contribute in reducing the operational water head in the Whale Tail Attenuation Pond. This will allowed to:
    - decrease operational risks (i.e. ice build-up above ramp and pit wall stability);
    - decrease overall volume of contact water and decrease global Arsenic (As) loading (less groundwater will flow in the pit and get in contact with PAG/ML material);

  - improve operation efficiency (smaller ice build-up beside the ramp that could reduce operation ramp width – keep double lane instead of having a single lane to keep a safe distance from the seepage area during winter time - observed at other Meadowbank operations).
- The collected water will be treated if the water quality does not meet the discharge criteria established in the Water Licence 2AM-WTP1826.
- 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 or through a diffuser in Whale Tail Lake (South Basin) or other alternatives.
- Non-contact water will be intercepted and directed away from disturbed areas by means of natural catchment boundaries and/or man-made diversion structures (i.e. channels, dikes, and pumps) and will be allowed to flow to the neighbouring waterbodies.

Underground development groundwater and contact water will be managed separately from surface infrastructure contact water. For the purpose of underground water management, water management infrastructure were defined based on the following undergroundwater management guideline principles:

- Heating is required when mining below top of cryopeg;
- Brine needed until cryopeg elevation is reached (-275m)
- Contact a non-contact underground water not segregated – segregation is an opportunity;
- Separate mine in two water circuits: permafrost/under permafrost [upper/lower zone];
- Grouting is a mitigation measure during development (not included in hydrogeological model);
- Underground storage stope (used to recycle underground water) – delay treatment, needed early;
- Recirculation of brine during mining operation;
- Limit addition of freshwater (used only for CRF, promote used of natural groundwater for operation;
- Treatment of underground saline water is required.

The key strategies detailed below were implemented to support the underground water management:

- A Groundwater Storage Pond (GSP) system is designed to capture TDS affected waters. Up to three GSPs are planned to provide operational flexibility and adaptive management opportunity. GSP-1 is used to store high salinity water from early mining operations through the permafrost. GSP-2 is used to store low salinity water. A potential third pond (GSP 3) is planned for contingency.

- Excess water volumes in the mine will be managed through the Underground Mine Stope and the GSP-1 for high salinity water, and through the GSP-2 for low salinity water. Excess water volumes may also be managed with GSP-3 planned for contingency, operational flexibility, and adaptive management opportunity ;
- At the end of underground mining, any remaining water in GSP ponds will be pumped underground for flooding of the underground workings.

3.1.2 Water Management System

The water management system includes contact water collection ponds, freshwater collection ponds, diversion channels, retention dikes, culverts, water treatment plants for effluent, potable water treatment plant, sewage treatment plant, and discharge diffusers (as listed in Table 3.2). These various components are identified on Figure A.1 to Figure A.8 in Appendix A.

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 Channel to the C watershed, and the South Whale Tail Diversion Channel to Lake A16 (Mammoth Lake). Waterbodies directly impacted by mining activities are presented in Table 3.1 and shown in Figures in Appendix A.

Table 3.1 Inventory of Waterbodies Directly Impacted by Mining Activities

Watershed	Primary Disturbance	Waterbody	Note
A	Dewatering	Lakd A17	Dewatering of Lake A17 (Whale Tail Lake) to Whale Tail Lake (South Basin)
	IVR Pit	Lake A46	Part of the IVR Pit footprint
		Lake A47	Part of the IVR Pit footprint
		Lake A49	Part of the IVR Pit footprint
		Pond AP-67	Part of the IVR Pit footprint
		Pond AP-68	Part of the IVR Pit footprint
	IVR WRSF Placement	Lake A50	Partially covered
		Lakd A51	Covered
		Lake A52	Covered
		Pond A-P21	Covered
	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)	Whale Tail Lake (North Basin) used as the Whale Tail Attenuation Pond Whale Tail Lake (South Basin) receives dewatering flows during dewatering activities, and discharge of treated effluent from June 2021 to closure
		Lake A16 (Mammoth Lake)	Receives discharge of treated effluent between June 2019 and July 2020.
		Pond AP-5	Used as a Groundwater Storage Pond
		Lake A53	Used as the IVR Attenuation Pond
		Lake A50	Covered by a Groundwater Storage Pond
C	Water Intake	Lake A16 (Mammoth Lake)	Sourced during operations for emulsion plant
		Lake 38 (Nemo Lake)	Sourced during operations
		Lake A17 (Whale Tail Lake)	Whale Tail Lake (South Basin) sourced during closure

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 the Appendix K: Project Design Considerations of the Water Licence 2AM-WTP1826 amendment, submitted to the NWB in May 2019.

Appendix A, Figure A.1 to Figure A.8 shows 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 • Construction of the low-permeability access road built of overburden and collection sump for Stage 1 WRSF • Freshwater intake causeway in Nemo Lake • Water Treatment Plant and Construction Water Treatment Plant • Pipelines and associated pump systems for water management and dewatering • Sewage Treatment Plant • Potable Water Treatment Plant • Discharge diffuser in Mammoth Lake • Culverts 184, 186, and Mammoth Channel
Year 1 to 7 (2019-2025) Operations	A.2 to A8	• Groundwater Storage Ponds • IVR Attenuation Pond Pump Station • Complete Whale Tail Dike • Complete Mammoth Dike • Complete the contact water intake causeway in the Whale Tail Attenuation Pond • Whale Tail WRSF Dike • Northeast dike • Whale Tail Dike Seepage Pump Station • South Whale Tail Diversion Channel • East Channel • Whale Tail WRSF Contact Water Collection System • IVR WRSF Contact Water Collection System ; • IVR Diversion • IVR D-1, D-2, and D-3 dikes • Underground Water Management System

WRSF = Waste Rock Storage Facility.

3.1.4.2 Dike Construction

Infrastructures under Approved Project

- **Whale Tail Dike**

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 156.0 metres above sea level (masl), and divert runoff downstream to the Lake A16 (Mammoth Lake) watershed through the South Whale Tail diversion channel. Whale Tail Dike will be constructed as a zoned rockfill dike on the lakebed foundation with a core composed of a fine filter dynamically compacted. A coarse filter will be placed between the rockfill and the fine filter. A cement-bentonite cutoff wall consisting mainly of secant piles will be constructed through this dense core and will act as a seepage barrier.

The construction technique will differ for the sections extending into the existing lake from those at the abutments. For the lake sections of the dike, construction will be initiated by advancing two single-line platforms built at elevation 154.0 masl. After cleaning out the central key trench by reaching the bedrock, backfill consisting of fine and coarse filters will be gently deposited up to elevation 154.0 masl. The WTD will then be constructed up to elevation 157.0 masl. From this level, the fine filter will be dynamically compacted by heavy tamping. The secant piles will then be installed from elevation 157.0 masl to 1.0 m below the bedrock surface. The type of material used for the cutoff wall will be a cement-bentonite mix. The maximum height of the secant pile cutoff wall is expected to be of 10.5 m.

At the west abutment, the footprint of WTD will cross an esker which extends well below lake level. The esker will be blasted to about elevation 153.0 masl at the west abutment. The bottom of the excavation would be 0.5 m above lake level and then the rockfill zones and fine filter would be placed. Above elevation 153.0 masl, a key trench to the bedrock will then be progressively excavated in the thawed esker to expose its surface. In addition, and to minimize the number of secant piles, it is proposed to place a cement-bentonite slurry cutoff wall where bedrock surface is above elevation 155.5 masl. The secant piles will overlap the cured CB slurry cutoff over 1.5 m in horizontal length.

The strategy for the east abutment will be different than for the west abutment. It would be beneficial to remove (in the core trench area) the layer that contains ice rich till prior to the placement of any material. Due to schedule and access constraints, the east abutment will be blasted in order to remove about 4 m of frozen soil (in the core trench area) that contains ice rich material.

The performance of 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 will be monitored all along the dike to note the thermal impact of raising the lake water level. Monuments and inclinometers will be installed along the dike as well. Typical sections of Whale Tail Dike and of Whale Tail Dike abutment are shown in Figure 3.1. All design drawings and figures can be found in the Whale Tail Dike Detailed Design Report (SNC, 2018).

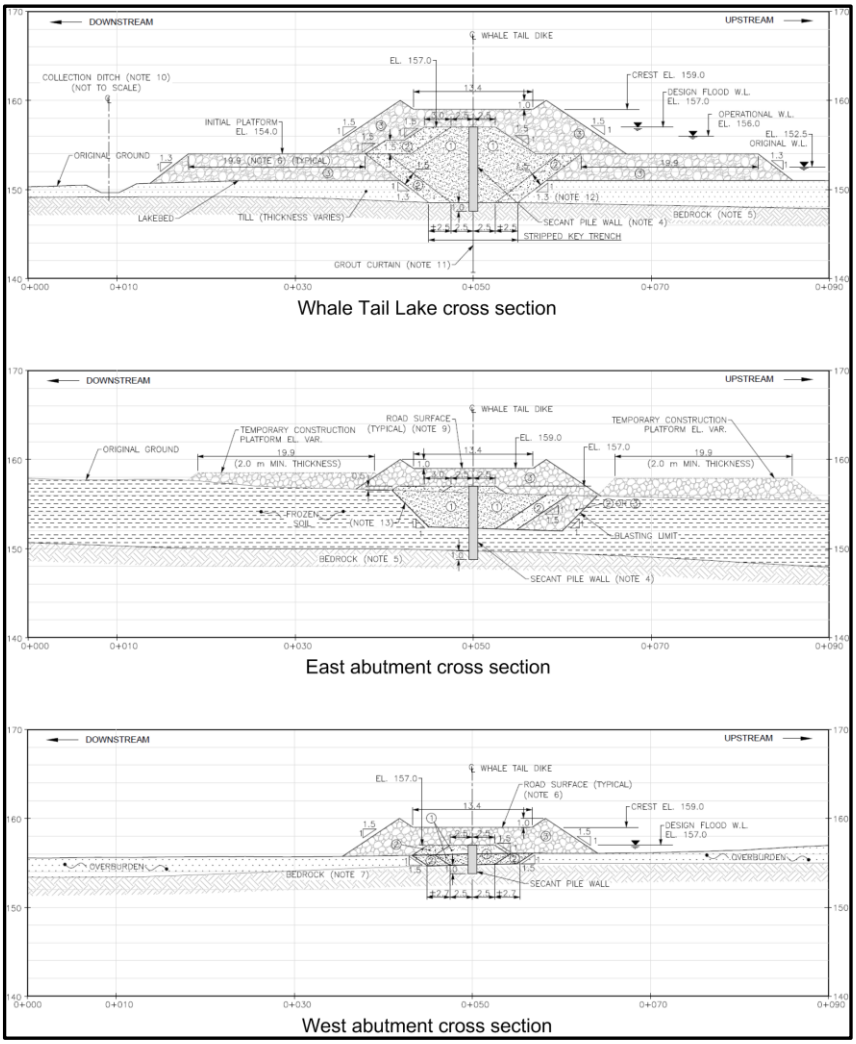


Figure 3.1 Typical Sections of Whale Tail Dike and Whale Tail Dike Abutment

- **Mammoth Dike**

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. The concept of this structure is similar to the other dikes in shallow water operated by Agnico Eagle (as Vault Dike). Mammoth dike has a length of about 300 m and a height of 2 m. It will be a rockfill dike lined with bituminous geomembrane on its upstream face encapsulated at the toe in a layer of fine filter amended with bentonite (FFAB) liner in turn constructed in a key trench. 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 the FFAB from thawing. The winter construction technique aims to reinforce the permafrost strength of the foundation.

Whale Tail WRSF Dike

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 WRSF dike is about 300 m and 5 m height and has been classified as a high based on CDA Guidelines. As the Mammoth Dike, the Whale Tail WRSF Dike will be a rockfill dike with a bituminous liner on its upstream face encapsulated at the toe in a layer of FFAB liner in turn constructed in a key trench anchored to the bedrock during the summer season.

The liner 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 bituminous liner will be sealed with FFAB. 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. If during the operation the degradation of the permafrost occurs, a grout curtain will be installed to enhance the performance of the dike. A typical section of the Whale Tail WRSF Dike is shown in Figure 3.2.

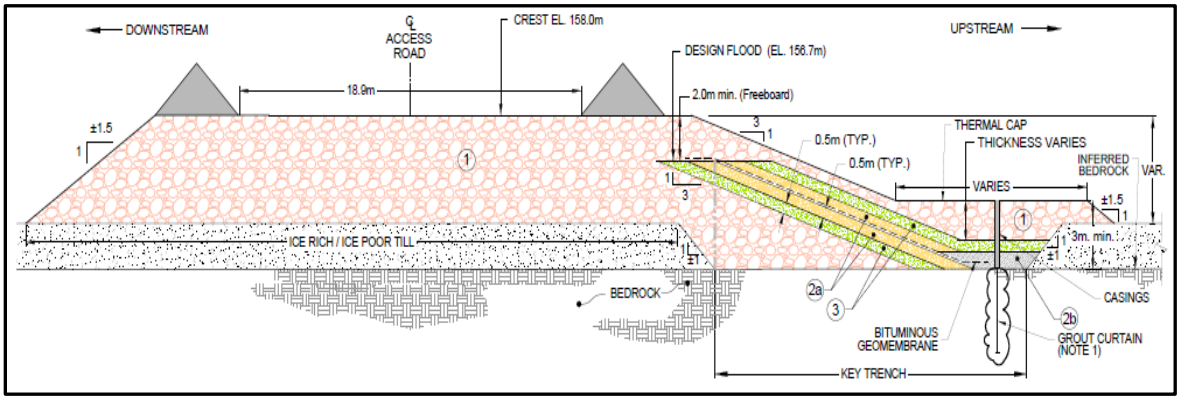


Figure 3.2 Typical Section of Whale Tail Waste Rock Storage Facility Dike

Note: Adapted from SNC (2015).

Northeast Dike

The Northeast (NE) Dike is a temporary structure with an estimated service life of about two (2) years and is designed to prevent runoff from the Northeast watershed reporting to the Whale Tail Pit As both Mammoth and WRSF Dikes, the upstream slope of the NE Dike will be lined with bituminous geomembrane encapsulated at the toe in a layer of FFAB liner in turn constructed in a 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. Dewatering should be completed prior to beginning of winter to promote development of permafrost in the foundation. A thermal cap will be put in place to limit the penetration of heat into the foundation. A typical section of the Northeast dike is shown in Figure 3.3.

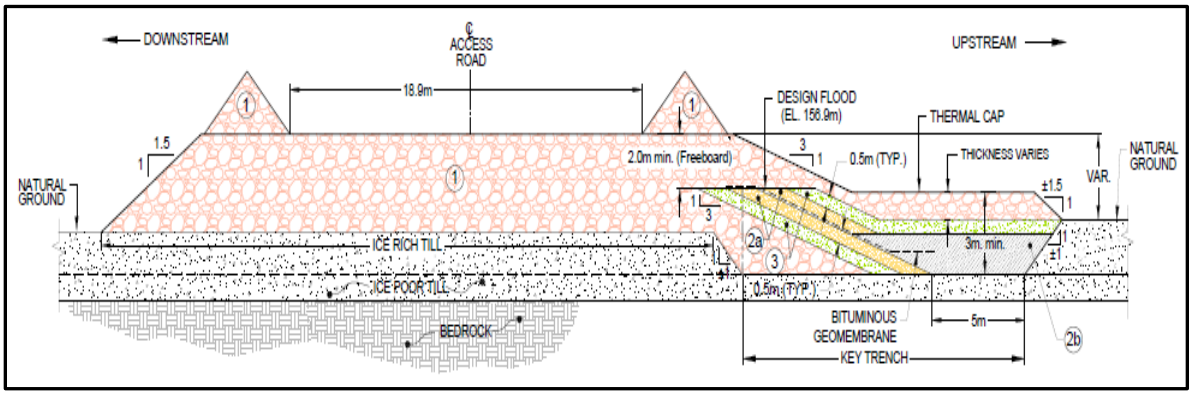


Figure 3.3 Typical Section of Northeast Dike

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, a total of four (4) layers of turbidity curtains will be installed across Whale Tail Lake (two (2) on each side of the dike). These curtains will be deployed concurrently with the start of the dike construction to contain turbid water caused by the construction 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 final location of the curtains will depend of the final dike design and site conditions.

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.

Infrastructures Under Expansion Project

During the Expansion Project, flow of surface water into the Whale Tail Pit will continue to be controlled by Whale Tail Dike and Mammoth Dike. Flow of surface water into IVR Pit will be controlled by IVR Diversion and A53 Dikes. Construction mitigation measures and methods of A53 Dikes are consistent with measures and methods for dike construction of Approved Project infrastructure (above).

IVR Dikes

The design of IVR Dikes will consider the latest Dam Safety Guidelines produced by the Canadian Dam Association (CDA, 2013, 2014) with respect to dam classification and the American Society for Testing and Materials (ASTM) for the geotechnical components of the work. Rip-rap protection will be sized following the guidance presented in USACE (1994). Wind setup and wave run-up will be defined based on the methodology described in USACE (1984). If needed, culvert will be designed according to MTQ (2014). The MDMER (Metal and Diamond Mining Effluent Regulation) is applicable to the project site; however the design of the Water Treatment plant is not part of this scope.

The design will use Annual Intensity-duration-frequency (I-D-F) curves, available from Baker Lake A meteoroidal station operated by Environment Canada (EC), as follows:

Table 3.3 I-D-F Baker Lake A Station

Duration	Return Period [year]						
	2 years	5 years	10 years	20 years	25 years	50 years	100 years
	Annual Rainfall Depth [mm]						
5 min	2	3	3	4	4	5	5
10 min	2	3	4	5	5	5	6
15 min	3	4	4	5	5	6	6
30 min	4	6	6	7	8	9	9
1 h	6	9	10	12	12	14	15
2 h	9	13	16	19	20	22	25
6 h	17	23	27	31	32	36	39
12 h	22	32	39	45	48	54	60
24 h	27	40	48	57	59	67	75

Source: Environment Canada

The current design of the IVR Dikes consist on durable and non-acid generating rock, with the upstream slope to be lined with a Bituminous Geomembrane (BGM) embedded in the fine filter zone on the slope, and anchored in a layer of FFAB at its toe. The fine filter is in turn separated from the rockfill by a transition zone referred to on the design drawings as coarse filter. The Lake A53 catchment remains at baseline conditions until 2022, when it becomes the IVR Attenuation Pond following fishout once the IVR Attenuation Pond dike is constructed and dewatering of Lake A53; however, its outlet only drains naturally to Whale Tail Lake (North Basin) in 2018, prior to its diversion to Whale Tail Lake (South Basin) from 2019 to 2022.

The IVR Attenuation Pond is operational by freshet 2022. The dike desing could be optimized at the detail engineering level phase and the design report will be submitted to regulators for approval via 60-day Construction Notice, per Water License condition. A typical section of the planned Whale Tail WRSF Dike is shown in Figure 3.4.

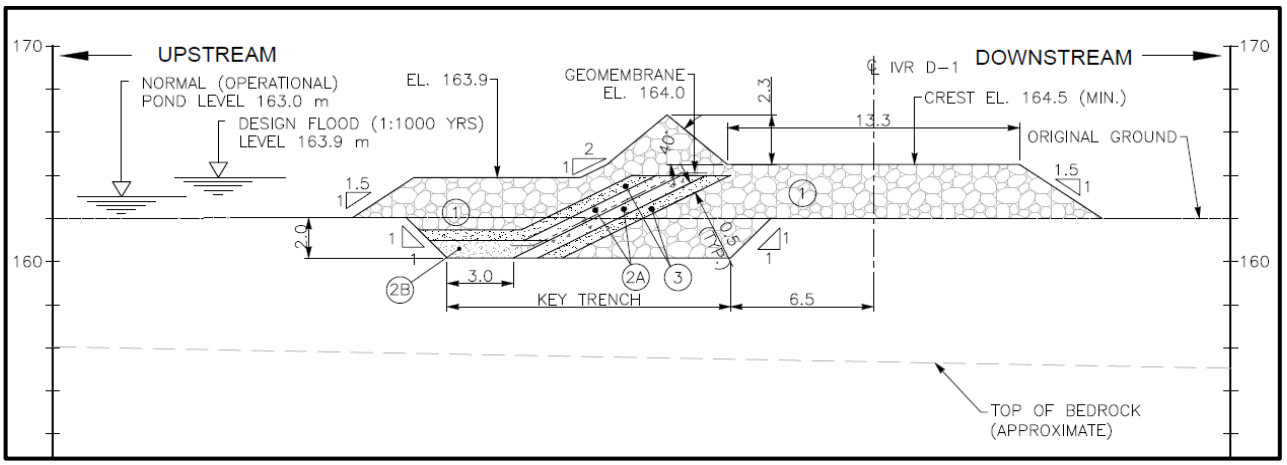


Figure 3.4 Typical Section of dike IVR-D1

The discharge diffuser at Whale Tail Lake (South Basin) will be similar to the diffuser designed and authorized for Mammoth Lake discharge and authorized under the current Type A Water Licence.

3.1.4.3 Dewatering

As per Type A Water Licence 2AM-WTP1826, Agnico Eagle will complete the dewatering of Whale Tail Lake (North Basin) in 2019 following the construction of the dike and the fish out. 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. Dewatering of Whale Tail Lake (North Basin) is initiated through Whale Tail Lake (South Basin) during frozen conditions. 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 the Whale Tail Lake (South Basin) 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 O-WTP first and then discharged to Lake A16 (Mammoth Lake) after treatment. The dewatering activity is planned for 45 days starting from March 2019 to Whale Tail Lake and to Lake A16 (Mammoth Lake) in June 2019.

The Expansion Project has not changed the dewatering of the Whale Tail Lake (North Basin); however, waterbodies and ponds within the footprint of the IVR Pit and IVR Attenuation Pond will require dewatering at the start of April 2022 and completed in May. Indeed, to allow the mining of the IVR Pit, lakes A47 and A49 would need to be dewatered in 2020. Similar to the Whale tail (North Basin), approximately 2/3 of the dewatered water from Lake A53 would be pumped and directly discharged to Whale Tail Lake (South Basin), prior to operations of the IVR Attenuation Pond prior to Freshet 2022. The remaining 1/3 of the water will be processed through the O-WTP during open water

conditions. The IVR Attenuation Pond is intended to manage all contact water from 2022 to closure while discharging through the O- WTP during open water conditions.

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 water management 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.

The Expansion Project will include construction and operations of water management infrastructure, either consistent with, or in addition to Type A approved infrastructure and contact versus non-contact water management. Non-contact water is defined as surface water or runoff that is not physically or chemically affected by a mining project's development areas and/or activities. Contact water is defined as surface water or runoff that has been in contact with Project development areas and/or activities. Any water requiring treatment will be pumped to the water treatment plant(s) prior to discharge through the diffuser in Mammoth Lake or through a diffuser in Whale Tail Lake (South Basin) or other alternatives.

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). Water quality objectives for arsenic and phosphorous will be meet via the proposed diffusor design: 10 ports at 12.6 m spacing and 75mm, diameter diffusor ports, effluent mixing (mixing zone). Within Mammoth Lake, the required dilution of WRSF seepage is predicted to be met at 60 m from the discharge location in all scenarios. A rock fill weir at outlet will channelize seepage outflow into Mammoth Lake and facilitate dilution. Diffuser in Whale Tail (South Basin) will be similar to the Mammoth Diffuser.

Non-contact water will be 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) and from Lake A16 (Mammoth Lake) during operations, and from Whale Tail Lake (South Basin) during closure.

Table 3.4 Water Management Activities during Construction and Operations

Mine Year	Key Water Management Activities and Sequence
Year -1 (2018)	• Pump contact water from Whale Tail WRSF sump to Quarry 1 • Pump contact water from the Starter Pit to Quarry 1 • Pump turbid water from construction to Quarry 1 • Pump runoff from Industrial Sector and Main Camp Sector to Quarry 1

Mine Year	Key Water Management Activities and Sequence
	• Pump runoff from Ore Stockpiles and Construction Material Stockpile (NPAG WRSF) to Quarry 1 • Pump excess water from underground sump to Underground Storage Stope • Collect runoff from Underground WRSF in GSP-1 • Pump STP effluent to Whale Tail Lake (North Basin) • Freshwater intake initially located in Whale Tail Lake (South Basin); moved to Lake C38 (Nemo Lake) • Construct Mammoth Dike • Construct WRSF Dike • Initiate construction of Whale Tail Dike • Commission TSS removal unit of the Construction WTP
Year 1 (2019)	• Complete construction of Whale Tail Dike • Dewater Whale Tail Lake (North Basin) to Whale Tail Lake (South Basin) • Commission arsenic removal unit of the Operation WTP • Pump contact water from the Whale Tail Pit to the Whale Tail Attenuation Pond • Pump contact water from the WRSF Pond to the Whale Tail Attenuation Pond • Treat Quarry 1 contact water through the TSS and arsenic removal units of the Operation WTP and discharge in Lake A16 (Mammoth Lake) • Pump STP effluent to the Whale Tail Attenuation Pond • Treat the Whale Tail Attenuation Pond contact water through the TSS and arsenic removal units of the Operation WTP and discharge in Lake A16 (Mammoth Lake) in summer months • Construct East Channel and divert non-contact water from the East Sector and Lake A53 to Whale Tail Lake (South Basin) • Construct Northeast Dike and divert non-contact water away from the north shore of Whale Tail Pit to Lake A16 (Mammoth Lake) by pump via the TSS and arsenic removal units of the Operation WTP
Year 2 (2020)	• Construct IVR Diversion and divert non-contact water from the Northeast Sector to Nemo Lake • The elevated Whale Tail Lake (South Basin) overflows to Lake A16 (Mammoth Lake) through the Whale Tail Lake Diversion Channel • Treat GSP 2 contact water through the TSS and arsenic removal units of the Operation WTP and discharge to Lake A16 (Mammoth Lake) in summer months • Treat the Whale Tail Attenuation Pond contact water through TDS Treatment plant and Operation Water Treatment Plant in winter months; discharge permeate in Lake A16 (Mammoth Lake) and brine in GSP 1 • Pump contact water from the IVR Pit to the Whale Tail Attenuation Pond • Pump contact water from the IVR WRSF Contact Water Collection System to the Whale Tail Attenuation Pond • Pump seepage water from the Whale Tail South Well to Whale Tail Lake (South Basin) • Pump excess water from underground sump to GSP 1 when Underground Storage Stope is full • Pump Underground Storage Stope high salinity water to GSP 1

Mine Year	Key Water Management Activities and Sequence
Year 3 (2021)	• Capture runoff from parts of the Whale Tail WRSF and NPAG WRSF; pump to the Whale Tail Attenuation Pond • Treat the Whale Tail Attenuation Pond contact water through the TSS and arsenic removal units of the Operation WTP and discharge in Whale Tail Lake (South Basin) in summer months • Treat the Whale Tail Attenuation Pond contact water through TDS Treatment plantin winter months; discharge permeate in Whale Tail Lake (South Basin) and brine in GSP-1 • Fishout Lake A53
Year 4 (2022)	• Dewater Lake A53 to Whale Tail Lake (South Basin) • Pump contact water from the Whale Tail Pit to the IVR Attenuation Pond • Pump contact water from the WRSF Pond to the IVR Attenuation Pond • Pump contact water from the IVR Pit to the IVR Attenuation Pond • Pump contact water from the IVR WRSF Contact Water Collection System to the IVR Attenuation Pond • Pump contact water from the Whale Tail Attenuation Pond to the IVR Attenuation Pond • Capture runoff from Whale Tail WRSF and NPAG WRSF; pump to the IVR Attenuation Pond • Treat the IVR Attenuation Pond contact water through the TSS and arsenic removal units of the Operation WTP and discharge in Whale Tail Lake (South Basin) in summer months • Pump excess underground sump water to the GSP once underground operations cease brining of drilling waters • Treat GSP 2 water with TDS Treatment plant in summer months; discharge permeate to Whale Tail Lake (South Basin) and brine to GSP 1 • Commission the desalination unit of the TDS Treatment plant • Treat GSP 1 water through desalination unit of the TDS Treatment plant; discharge permeate to Whale Tail Lake (South Basin) and transport salt solid off site
Year 5 to Year 7 (2023 to 2025)	• Commission the desalination unit (S66) of the TDS Treatment plant • Treat GSP 2 water through desalination units of the TDS Treatment plant; discharge permeate to Whale Tail Lake (South Basin) and transport salt solid off site

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

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 3.5 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	IVR Attenuation Pond
Whale Tail and IVR WRSFs Sector	Whale Tail WRSF Pond (Quarry 1 for the temporary Stage 1 WRSF sump)	
Ore Stockpiles	Whale Tail Attenuation Pond	
Landfill	Whale Tail WRSF Pond	
Open Pits (Whale Tail and IVR)	Open pit sumps	

WRSFs = Waste Rock Storage Facilities.

3.1.4.5 Erosion and Sediment Control Plan

As described in the previous sections, Expansion Project site infrastructure, channels, sumps and associated water management activities are designed with consideration of site wide erosion and sediment control. In addition to design controls, best management practices (BMPs) will furthermore ensure that activities, practices, devices or a combination thereof will prevent or reduce the release of sediments and will control erosion. The selection of permanent or temporary BMPs will be specific to the site and timing and may require regulatory approval prior to installation or construction.

Temporary BMPs Whale Tail and IVR Pits may include:

- Silt fences and fabric installation;
- Turbidity curtains;
- Sediment control basins to detain sediment-laden water; and
- Diversion of flows away from the construction area.

Permanent BMPs at the Whale Tail and IVR Pits may include:

- Infiltration basins and trenches;
- Sedimentation basins or ponds; and
- Construction of swales in ditches.

Monitoring of erosion and sedimentation associated with construction and operations are discussed in Section 3.2 of this plan and are detailed in the Water Quality and Flow Monitoring Plan (Agnico Eagle, 2019) and dike construction sediment control and monitoring is presented in Expansion Project Dike Construction and Dewatering Management Plan (Agnico Eagle, 2019).

For specific details on sediment control guidelines and license requirements, on erosion monitoring and mitigation during freshet and the rise of water level in the South Basin of Whale Tail Lake, refer to the Whale Tail Project - Erosion Management Plan (Agnico Eagle, 2018b).

3.1.4.5 Landform water balance for the waste rock storage facilities

O'Kane Consultants developed a landform water balance model in April 2019. The objective of the landform water balance was to estimate the runoff, interflow, and basal seepage rates for different slopes and aspects of the Whale Tail and IVR WRSFs (OKC, 2019).

The results of the landform water balance for the Whale Tail and IVR WRSFs are provided in Table 3.5. The results summarize the volume of annual runoff expected from the landforms as a percentage of incident precipitation (both snow and rainfall). Results of the surface water balance support the conceptual thermal model of the WRSFs which assume that the hydrologic regimes are expected to be different based on North and South aspect. Generally, higher net radiation results in greater evaporation and soil heating. With more evaporation, less water is available to runoff and/or infiltrate. Higher net radiation will also result in more sublimation, as more energy is available to convert snow into water vapour.

Table 3.6 Summary of average surface water balance for different specs of the WRSF

Water Balance Parameters	Plateau	SE Aspect	NW Aspect
Total Precipitation (mm)	296 mm	296 mm	296 mm
Rainfall (% of Total Precipitation)	55-60%	55-60%	55-60%
Snow (% of Total Precipitation)	40-45%	40-45%	40-45%
Actual Evaporation (% of Total Precipitation)	25-30%	30-35%	25-30%
Runoff (% of Total Precipitation)	<5%	<5%	10-15%
Net Percolation (% of Total Precipitation)	30-35%	25-30%	20-25%
Sublimation (% of Total Precipitation)	35-40%	40-45%	40-45%

Source: OKC (2019).

These results in an overall runoff rates from the Whale Tail and IVR WRSFs of approximately 5% of incident precipitation. Runoff was assumed to interact with surficial materials to a depth of 30 cm.

The surficial materials interacting with landform runoff will change over time as progressive reclamation is completed. The majority of runoff from the WRSFs is expected to occur as a result of spring melt; however, some runoff is expected throughout the unfrozen period.

- **Basal Seepage**

The high infiltration capacity of the cover system materials and waste rock materials result in a propensity for incident precipitation to result in infiltration, rather than runoff (Table 5.2). As water infiltrates into the surficial materials, net percolation flows vertically through the WRSF, eventually freezing back at depth. Modelling indicates that freeze-back throughout the depth of the pile is consistently occurring by 2073 (Figure 5.1). However, the base layer of the WRSF is consistently frozen from the time of placement. As a result, basal seepage from the landform is negligible.

- **Interflow**

There is some lateral flow of water within the cover system on the angle of repose slopes (known as interflow), however, lateral flow infiltrates vertically in zones of enhanced infiltration along the toe of each bench of the WRSF. A small portion (less than 1%) of incident precipitation over the entire landform(s) is expected to exit the landform as interflow. This occurs when infiltration occurs along the slope of the lowest bench of the WRSF. This flow path interacts with the entire 4.7 m depth of the cover system, along a maximum flow path of approximately 10 m. Interflow does not interact with the potentially acid generating and metal leaching waste rock. This is shown conceptually in Figure 5.3.

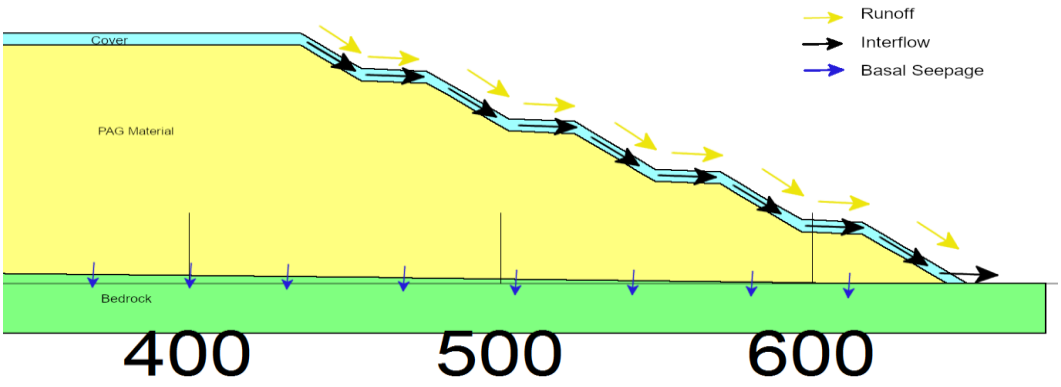


Figure 3.5 Sketch of estimated runoff, interflow, and basal seepage within the WRSFs
Source: OKC (2019).

The results of the WRSF landform water balance were used as inputs for the 2019 Mean Annual Water Balance Update for the project expansion (Golder 2019d). Tables 3.5 and 3.6 show a comparison between the estimated water inflows reporting to the Whale Tail Attenuation Pond and the IVR Attenuation Pond, respectively, that were calculated for the FEIS (2018) vs. 2019 Mean Annual Water Balance Update to support the NWB submission for the project expansion.

Table 3.7 Comparison of estimated water inflow reporting to the Whale Tail Attenuation pond

Year	Total Inflow (m3)		
	FEIS 2018 (m^3)	Update 2019 (m^3)	Percent change (%)
2018	3,412,446	3,462,214	1.46
2019	1,229,194	1,275,572	3.77
2020	1,351,245	1,285,051	-4.90
2021	1,520,985	1,461,483	-3.91
2022	595,276	610,248	2.52
2023	355,539	347,979	-2.13
2024	355,114	348,453	-1.88
2025	355,170	347,979	-2.02
2026	605,809	518,658	-14.39
2027	566,128	523,543	-7.52
2028	561,167	527,615	-5.98
2029	562,008	528,743	-5.92
2030	561,713	529,629	-5.71
2031	557,533	526,409	-5.58
2032	553,234	521,834	-5.68
2033	549,050	517,180	-5.80
2034	544,299	513,958	-5.57
2035	532,587	507,150	-4.78
2036	516,178	491,269	-4.83
2037	512,750	477,466	-6.88
2038	523,503	482,127	-7.90
2039	502,857	492,490	-2.06
2040	3,876,129	455,845	-88.24
2041	4,444,164	4,023,224	-9.47

Source: Golder (2019d).

Table 3.8 Comparison of estimated water inflow reporting to the IVR Attenuation pond

Year	Total Inflow (m3)		
	FEIS 2018 (m^3)	Update 2019 (m^3)	Percent change (%)
2018	241,682	237,711	-1.64
2019	241,682	237,715	-1.64
2020	241,711	237,744	-1.64
2021	241,682	237,715	-1.64
2022	1,303,705	1,208,976	-7.27
2023	1,483,305	1,355,124	-8.64
2024	1,457,334	1,307,746	-10.26
2025	1,459,131	1,321,091	-9.46
2026	173,719	149,870	-13.73
2027	172,197	148,292	-13.88
2028	172,219	148,311	-13.88
2029	172,197	148,292	-13.88
2030	172,197	148,292	-13.88
2031	172,197	148,292	-13.88
2032	172,219	148,311	-13.88
2033	172,197	148,292	-13.88
2034	172,197	148,292	-13.88
2035	172,197	148,292	-13.88
2036	172,219	148,311	-13.88
2037	172,197	148,292	-13.88
2038	172,197	148,292	-13.88
2039	172,197	148,292	-13.88
2040	172,219	148,311	-13.88
2041	172,197	148,292	-13.88

Source: Golder (2019d).

As shown in tables 3.5 and 3.6, the update water balance shows an overall reduction in the inflow volume to the ponds. The reduction in water inflow to the ponds is due to the estimated reduction of seepage outflow from the WRSFs.

3.1.4.6 Water Management in Whale Tail Waste Rock Storage Facility

The Whale Tail WRSF will be used to permanently store all waste rock and overburden from mining activities. With the consideration to minimize the overall footprint of the Expansion Project to the extent practicable, an extension of the Whale Tail WRSF footprint will be required. Pending approval of this extension, all materials will be stored within the Approved Project footprint, refer to the Waste Rock Management Plan. As mentioned in the document Amaruq Stage 1 WRSF, Ore Stockpile 1 and Starter Pit Design Report and Drawings (Agnico Eagle, 2018c), while awaiting the construction of the Whale Tail WRSF dike expected in winter 2019, a Stage 1 WRSF will be initiated. The Stage 1 WRSF, located within the footprint of the final location of the WRSF, will be positioned as to be able to control the watershed using the topography in combination with temporary water management structures in order to prevent potentially contaminated contact water from seeping into the environment. The duration of this Stage 1 WRSF will be during the second half of 2018 until the aforementioned WRSF dike is constructed or when weather conditions are sufficiently cold that no thawing or water runoff can occur.

The catchment of the Whale Tail WRSF Pond is located in the northern headwaters of the Lake A16 (Mammoth Lake) catchment. The ultimate footprint of the Whale Tail WRSF will span three catchment areas, and runoff from the Whale Tail WRSF will therefore report to the Whale Tail WRSF Contact Water Collection System, the North Channel Collection area, and the IVR Pit. During operations, the Whale Tail WRSF Contact Water Collection Systems and the IVR Diversion area will receive runoff from WRSF within their catchment areas, natural runoff from the surrounding area, and direct precipitation. Its runoff drains naturally to Lake A16 (Mammoth Lake) upon issuance of Licence A runoff is collected in a temporary sump and diverted to Quarry 1 until the Whale Tail Attenuation Pond becomes operational in 2019 (following construction of the Whale Tail WRSF Dike at the end of 2018).

The runoff from the Whale Tail WRSF in the Whale Tail WRSF Contact Water Collection system, then collected in the Whale Tail WRSF Pond, diverted to the Whale Tail Attenuation Pond from 2019 to 2025 (i.e., when the IVR Attenuation Pond becomes operational), and to the IVR Attenuation Pond from 2022 to 2025. More details about management of the Whale Tail WRSF are presented in the Waste Management Plan.

3.1.4.7 Water Management in IVR Waste Rock Storage Facility

The IVR WSRF becomes operational once the IVR Pit is initiated. Prior to its operation, the natural catchment forms a portion of the Northeast Sector. Runoff from the IVR WRSF is captured by perimeter ditches and conveyed to the IVR WRSF Water Collection System prior to being pumped to the active attenuation pond (i.e., either the Whale Tail Attenuation Pond or the IVR Attenuation Pond). This conveyance system is decommissioned at closure thereby re-establishing natural drainage pattern towards Whale Tail Lake (North Basin) via the IVR Pit. The total catchment of the IVR WRSF increases proportionally with the increase in waste rock footprint which encroaches on the natural catchment of the IVR Attenuation Pond over time.

3.1.4.8 Water Management for Ore Stockpile Areas

The ore stockpiles are located within the catchment of the Whale Tail Attenuation Pond as shown in Appendix A. Based on the topographic information, contact water will naturally flow to the Whale Tail Attenuation Pond for further treatment. Water collection and management systems (i.e. pump, sumps,etc), will be deployed to direct the seepage and runoff to the pond.

The ore stockpiles eare designed based on the following considerations. A minimum 1.0 m of overburden and/or waste rock will be placed over original ground to reduce any thaw-induced differential settlements. Waste rock will then be placed to follow the natural topography, thereby reducing the likelihood of water ponding on the surface of the pad requiring additional maintenance. A final grade of about 0.5% sloping towards the Whale Tail Attenuation Pond will be achieved. Any surface run off from the ore stockpile or the pad will therefore be directed to the Attenuation Pond containment area.

3.1.4.9 Water Management for the Whale Tail Pit Sector

In the last quarter of 2019, following dewatering of the North Basin of Whale Tale Lake, mining is expected to intersect the closed talik, and groundwater inflow to the pit is predicted to be 1,140 m3/day. The results of the 2019 Annual Water Balance Report (Golder 2019d) show differneces in the water balance for the Whale Tail Pit sector. The most significant changes to inflows to the Whale Tail Pit are caused by the following:

The updated drainage area delineation results in a slightly larger drainage area for the Whale Tail Pit (1.17 km2 vs 1.16 km2 previously).

- North Sector and IVR WRSF Inflows. Runoff from the North Sector and the IVR WRSF are significantly reduced due to the updated calculation of runoff and seepage from the WRSFs.
- The reduction of predicted groundwater flows to and from the pit. By the end of operations, there is 121,600 m3 (3%) less inflow to the pit than previously predicted (4,559,850 m3 vs. 4,681,450 m3). For closure, the result of these updates is that the filling of Whale Tail pit is delayed by a year (2040 instead of 2039). Refer to section 5.7.3 of the 2019 Annual Water Balance report for more details.

The overall inflow to the pit does not increase significantly as the pit deepens because the flow of water is primary through the permeable weathered bedrock and because the lower portion of the pit is in permafrost.

Groundwater inflow predictions during operations conservatively assumes that no freeze-back will occur in the pit walls during mining. This assumption was adopted for Whale Tail Pit to be conservative and because during the first few years of mining, the pit will be both widened and deepened, resulting in the continual exposure of unfrozen bedrock. During the later years of mining; however, the pit development will be entirely within the permafrost and significant freeze back in the pit walls is considered possible and has been observed at Meadowbank.

Although not simulated, if freeze back does occur as is the case at Meadowbank, actual groundwater inflow to the pit could be significantly lower.

TDS concentration in the groundwater inflow to the pit was predicted to decrease during mining from approximately 120 mg/L (2019) to 10 mg/L (2023 to 2025). The relatively low TDS concentration and decrease in TDS over time reflects the minimal upwelling of higher salinity waters at depth due to the presence of the permafrost at the base of the pit and the high contribution of lake water and Whale Tail Attenuation Pond water. As previously discussed, the predicted TDS concentrations in this model only account for TDS loading from groundwater and TDS loading from the Whale Tail Attenuation Pond and South Basin of Whale Tail Lake were accounted for in the Site-wide water quality model.

3.1.4.9 Water Management for the IVR Pit Sector

The proposed IVR Pit is located just north of Whale Tail Lake, within the Northeast Sector in the permafrost environment, thus no groundwater inflows are predicted. Water management infrastructures will be designed to only manage runoff water reporting to the pit. The IVR Pit is initiated in Q3 2020. Its operational runoff is conveyed to the active attenuation pond (i.e., either the Whale Tail Attenuation Pond or the IVR Attenuation Pond).

The results of the 2019 Annual Water Balance Report (Golder 2019d) show differneces in the water balance for the IVR Pit sector. The most significant changes to inflows to the Whale Tail Pit are caused by the updated drainage area delineation, which results in a 12% higher local drainage area during operations (1.18 km2 vs 1.05 km2 previously). At closure, the contributing drainage area is 7% smaller (25.4 km2 vs 27.3 km2 previously).

By the end of operations, there is 38, 950 m3 (3.5%) more inflow to the pit than previously predicted (1,159,650 m3 vs. 1,120,700 m3). For closure, there is no change to the pit filling schedule (2027). Refer to section 5.9.3 of the 2019 Annual Water Balance report for more details.

3.1.4.10 Water Management for Haul Road

A network of access and haul roads will connect the ore body to the Whale Tail and IVR 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 Project 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 are 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, straw booms, turbidity curtains, interceptor channels, rock check dams, and/or small sedimentation ponds.

3.1.4.11 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 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 Whale Tail Pit Landfill and Waste Management Plan.

3.1.4.12 Sludge/Brine Management from Water Treatment Plants

This section summarizes water treatment requirements and is extracted from the Mean Annual Water Balance and the Mine Site and Downstream Receiving Water Quality Predictions, from Golder Associates, both dated May 2019. Any water requiring treatment will be pumped to the water treatment plant(s) prior to discharge through the diffuser in Mammoth Lake or through a diffuser in Whale Tail Lake (South Basin) or other alternatives discharge.

Sludge disposal will be done in the Whale Tail WRSF, as agreed on during the Whale Tail Pit final hearings.

OPERATION WATER TREATMENT PLANT (O-WTP)

From April to May 2019, the last third of volume of water from the Whale Tail Lake (North Basin) would be treated via the TSS removal unit of the O-WTP. It is not expected to require attenuation of arsenic. The first two-thirds of the volume is presumed free of suspended solids and will be discharged directly to Whale Tail Lake (South Basin).

The arsenic and TSS water treatment plant (O-WTP) is assumed to be active as of the beginning of March 2019, to treat the last 34% of dewatering from Whale Tail Lake (North Basin), which is discharged to Whale Tail Lake (North Basin). Subsequently, the O-WTP treat flows from Quarry 1 dewatering (June 2019), Whale Tail Attenuation Pond (2010 to 2022), discharge from GSP-1 (June 2020), dewatering of the North East (2019 through July 2020), the final 34% of dewatering volumes of Lake A53 (which becomes the IVR Attenuation Pond), and the IVR Attenuation Pond (June 2022 until closure).

TDS TREATMENT PLANT (S-WTP)

The S-WTP will include a TDS Treatment plant, which is assumed to be commissioned and active as of October 2020, at which point it will be used to treat contact water from the Whale Tail Attenuation Pond until May 2021, and again from October 2021 to April 2022.

In June 2022, the TDS Treatment plant will be used to treat low salinity water that is stored in the GSP-2 until closure. The TDS Treatment Plan unit is assumed to be active only from June through September. The permeate will be combined with the O-WTP effluent for discharge from site.

The brine produced from the TDS Treatment will be stored in the GSP-1. The S-WTP may also include two Desalination units, which will treat water stored in the GSP-1 Starting in April 2022, one Desalination unit will be active and will treat year-round. Starting in January 2023, a second, smaller Desalination unit will be available to increase the treatment capacity. The salt solid produced from treatment will be either used at site and/or shipped off site, and the permeate will be combined with O-WTP effluent for discharge from site.

The results of the 2019 Annual Water Balance Report (Golder 2019d) show changes to the treatment are an accumulation of all the upstream updates described above. The flows through the Project's treatment streams relative to the flows considered in the FEIS Addendum:

- O-WTP for TSS removal (non-contact water): Due to the change in the dewatering schedule ,there is a slight change in the fraction of the dewatering from the Whale Tail Lake (North Basin) that is sent to the O-WTP for TSS removal. The updated treated volume is 2% lower (1,128,350 m3 vs. 1,150,300 m^3 previously).

- O-WTP for TSS and arsenic removal: Overall, there is less contact water pumped to the attenuation ponds that collect the surface water requiring treatment (primarily due to the reduction in runoff from the WRSFs). As a result, there is a 5% reduction in contact water pumped to the O-WTP during operations (8,750,300 m3 vs. 9,241,350 m^3 previously).

- S-WTP (brine) Unit: Flows to the S-WTP (brine) unit are pumped at a constant rate, which was not changed in this update. There is therefore no change in the flows from this unit.

- S-WTP (brackish) Unit: In addition to water from the underground, the S-WTP (brackish) treats runoff from the Whale Tail Attenuation Pond during the winters of 2021 and 2022. During this time, there is a 6% increase in the runoff pumped from the pond due to the increased camp flows. Flows from the Underground Mine are treated at a constant rate, which has not changed in this update. The overall inflow tothe S-WTP (brackish) over operations is 831,000 m^3 (compared to 824,300 m^3 previously).

- Overall, these updates result in a net 4% decrease in treatment (10,927,850 m3 vs. 11,434,250 m3 previously) over the operations period.

3.1.4.13 Underground water Management

Underground development groundwater and contact water will be managed separately from surface infrastructure contact water. For the purpose of underground water management, the following key strategies were implemented to develop the underground water Management Plan:

- A Groundwater Storage Pond system (GSP) is designed to capture TDS (salt) affected waters. Up to three GSPs are planned to provide operational flexibility and adaptive management

opportunity. GSP-1 is used to store high salinity water from early mining operations through the permafrost. GSP-2 is used to store low salinity water. A potential third pond is planned as a contingency.

- Excess water volumes in the mine will be managed through the Underground Mine Stope and the GSP-1 for high salinity water, and through the GSP-2 for low salinity water. Excess water volumes may also be managed with GSP-3 planned for contingency, operational flexibility, and adaptive management opportunity ;
- At the end of underground mining, any remaining water in GSP ponds will be pumped underground for flooding of the underground workings.

The salt content of inflows from the Underground Mine is expected to decrease once underground development is advanced below the permafrost, after which drill water brining will stop and groundwater inflows will have a substantially lower natural salt content (generally less than 1%; Golder 2016). This lower salinity water is managed separately in the Holding.

The results of the 2019 Annual Water Balance Report (Golder 2019d) show differneces in the water balance for the GSP ponds as described below.

GSP-1

The local drainage area reporting to GSP-1 has increased from 0.12 km2 to 0.14 km2 (20%). This is due to thelarger footprint of the GSP-1 as well as the footprints of the underground waste pad and the underground ore stockpile. However, the total drainage area is slightly smaller (0.156 km2 compared to 0.162 km2). This is approximately 9% higher than reported for the FEIS Addendum reported in 2018

- The reduction of runoff from the Underground WRSF based on the OKC method of calculating runoff. This reduction only applies during operations. Once this waste rock is moved underground at closure, runoff from the pad reverts to the original calculation method.
- The reduction of overflow from the underground due to the updated hydrogeological inputs.

The impact of these changes results in a slight decrease (approximately 1%) in cumulative inflows to GSP-1 in operations (540,650 m3 vs. 545,100 m3). In closure however, there is more inflow to the watershed. By the time Whale Tail Lake (North Basin) reaches its final elevation in 2042, the cumulative inflows are 11% higher than for the FEIS case (947,100 m3 vs 853,200 m3), as shown in the figure 3.6

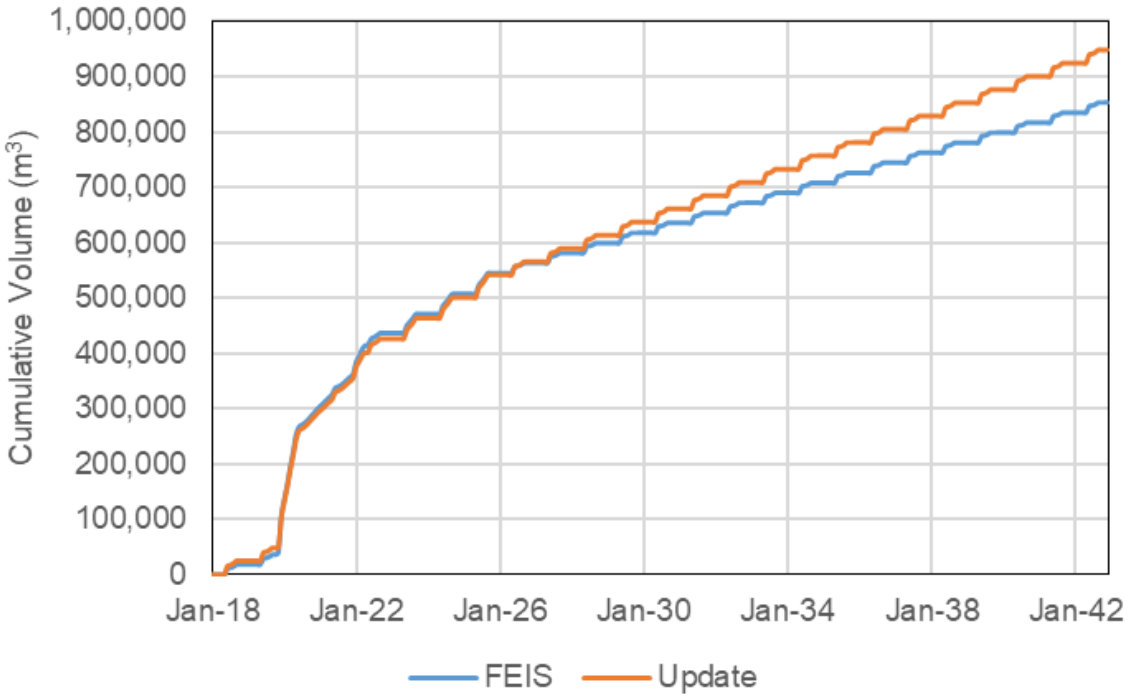


Figure 3.6 Comparison of Cumulative Inflows to GSP-1 under the FEIS Addendum and the Current Water Balances

GSP-2

- The previous model did not have a defined location or footprint for GSP-2. The local drainage area is also now defined. As a result, the local drainage area reporting to GSP-2 has increased by over 80%, from 0.034 km2 to 0.062 km2.
- The reduction of overflow from the underground due to the updated hydrogeological inputs.

The impact of these changes results in a decrease (approximately 15%) in cumulative inflows to GSP-2 inoperations (496,200 m3 vs. 587,450 m3). This changes in closure, when there is no longer overflow from the underground. By the time Whale Tail Lake (North Basin) reaches its final elevation in 2042, the cumulative inflows are only 1.5% lower than for the FEIS case (676,050 m3 vs 686,600 m3), as shown in Figure 3.7.

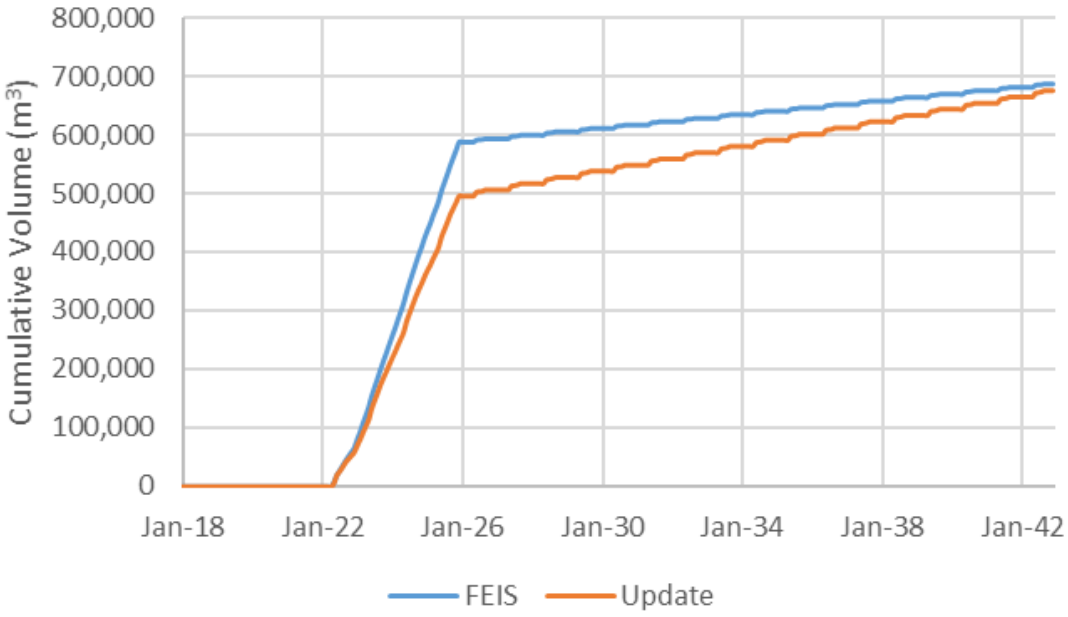


Figure 3.7 Comparison of Cumulative Inflows to GSP-2 under the FEIS Addendum and the Current Water Balances

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), Lake 16 (Mammoth Lake), and from Lake C38 (Nemo Lake), as per Part E, conditions 1, 2 and 3 of the Water License 2AM-WTP1826. Freshwater usage includes potable use, fire suppression, dust suppression, drilling water, if contact water is not available, water for the emulsion plant, and water for the truck shop. The freshwater source is Lake C38 (Nemo Lake), and Lake A17 (Whale Tail Lake) during closure. For explosives mixing and associated use, the water will be pumped from Lake A16 (Mammoth Lake), as per Part E, condition 4 of the Water License 2AM-WTP1826. 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, as per Part E, condition 6 of the Water License 2AM-WTP1826. 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 Freshwater Treatment Plant (potable). Currently, the Whale Tail Camp operations has a water treatment plant for potable (domestic) water. The design flow rate for the potable water for the main camp and accommodations (i.e., kitchen, laundry) is 84 cubic metres per day (m^3/day), based on a 400 people camp capacity, using both the existing exploration camp and additional 210 units and a nominal consumption of 240 litres (L)/day/person from Nemo Lake.

Agnico Eagle suggests with a projected increase in on-site staff in 2022 to 544 people for the Expansion Project, the existing authorized volumes from Nemo Lake should be adequate. 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. Detailed plant operation specifications were provided in Approved Project FEIS Volume 1, Section 1. 2.4.1.

Freshwater and potable water use will extend for an additional three to six years (during operations) and additional freshwater will be required from Whale Tail Lake at closure. The current Type A Water Licence provides for a maximum quantity of water use not to be exceeded at 240,000 m^3 annually during construction and operation. As well as 10,655,000 m^3 annually during closure.

It is anticipated that approximately 47,000,000 m^3 over 16 years from Whale Tail Lake is required to fill the mined-out Whale Tail Pit (i.e., approximately 55,000,000 m^3), IVR Pit (i.e., approximately 10,000,000 m^3), underground mine (i.e., approximately 1,000,000 m^3) and Whale Tail Lake (North Basin) (i.e., approximately 6,000,000 m^3) to its original level, representing approximately 2,900,000 m^3/year from Whale Tail Lake (South Basin).

3.1.5.2 Sewage Water Management

Sewage will be collected from the camp and change-room facilities and pumped to a STP using a New Terra System. The objective of the STP is to treat sewage to an acceptable level for discharge to the IVR 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 240 L per day per room for 400 people, for an average daily flow rate of 96 m^3/day (4 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.

Currently, the sewage treatment plant at the Amaruq camp can accommodate 400 workers as presented previously. With the addition of four wings to the Operations Camp for potential project expansion, the total camp capacity will increase to 544 workers. An expansion of the sewage treatment systems is thus required. These systems are built with typical 40-foot containers.

To upgrade the STP from the current 400 people to 544 persons, additional containers of equipment would be required. The following equipment would be added:

- Screens system;
- Anoxic tank;
- Aeration tank;
- Membrane tanks.

No major change in operation and water quality are expected with this expansion. The sewage treatment system will be designed based on a flow rate of 240 L per day per room for 544 people, for an average daily flow rate of 131 m^3/day (5.45 cubic metres per hour [m^3/hour]).

The sewage treatment plant receives two streams of sewage. The first source is domestic sewage, which is fed directly to the fine screening process to remove any fibers or debris that might damage the membranes. The second source is kitchen sewage which is pre-treated in the oil and grease tanks to remove oil and grease prior to being fed into the fine screen.

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. Further information on the management of this facility is described in the Whale Tail Sewage Treatment Plant Operation and Maintenance Manual.

Sewage treatment facilities will continue to be managed in accordance with the approved Amaruq Gold Wastewater Treatment System Operation and maintenance Plan dated December 2015 approved by the the NWB as provided in Part B, Item 14 of Type A Water Licence 2AM-WTP1526. As stipulated in Part B, Item 17, Agnico Eagle will review the Plans as required by changes in operation and/or technology and modify the Plans accordingly in the form of an addendum to be included in the Annual Report.

Table 3.9 Effluent Quality and Wastewater Characteristics

Parameter	Units	Regulatory Limit	Design Value
Wastewater			
• Biochemical Oxygen Demand	mg/L	-	952
• Total Suspended Solids	mg/L	-	300
• Total Kjeldahl Nitrogen	mg/L	-	130
• Ammonia nitrogen	mg/L	-	130
• Fat, Oil and Grease	mg/L	-	30
• pH	-	-	6 to 9.5
• Water Temperature	°C	-	10 to 25
• Alkalinity	mg/L as $CaCO_3$	-	471.1
• Prohibited Chemicals/Compounds	Not present		
• Grinder Pumps	Not present Upstream of MBR		
Effluent			
• pH	-	6-9.5	6.5 to 8.5
• Carbonaceous Biochemical Oxygen Demand	mg/L	<25	<5
• Total Suspended Solids	mg/L	<25	<1
• Un-ionized ammonia	mg/L	<1.25	<0.08
• $N0_3$-N	mg/L	<5	4
• TP	mg/L	<0.5	0.5
• Fat, Oil and Grease	mg/L	<5	<1
• Fecal Coliform	CFU/100mL	<200	Non-Detect
• Total Residual Chlorine	mg/L	<0.02	0

1. Noted values are assumed blend between kitchen and dormitory wastewater after the grease trap.
2. A complete list of prohibited chemicals is included in the membrane maintenance manual.

3.2 Operation, Maintenance, and Surveillance of Project Dikes

3.2.1 Consequence of Failure

The consequence of failure classification for all dikes is based on the guidelines provided in the Canadian Dam Association Dam Safety Guidelines (CDA, 2014). The Whale Tail Dike and the Mammoth Dike are rated as “High” consequence of failure structures, Northeast Dike, Whale Tail WRSF Dike is classified as “Low” consequence of failure structure. It is assumed that failure of Whale Tail Dike and Mammoth 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. Considering that 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.

It is estimated that the IVR D-1, D-2, D-3 could have a "Significant" consequence of failure structure. It is assumed that failure of IVR D-1, D-2, D-3 Dikes could flood the Road No.1, used as a haul road, resulting in associated threat to the safety of mine personnel, equipment, and other workings within the dewatered area. No flooding or inundation mapping has been completed.

3.2.2 Operation, Maintenance, and Surveillance Manual

The Meadowbank Mine OMS manual (Whale Tail Addendum) 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 Part B, condition 13 of the Water License 2AM-WTP1826 . The OMS Manual will be an extension of the existing Meadowbank OMS Manual (Agnico Eagle, 2017).

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 (2018c), the design criteria for minimum freeboard for Whale Tail Dike, Mammoth Dike, Whale Tail WRSF Dike, Northeast Dike are presented in Table 3.10. 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 3.10 Design Minimum Freeboard

Structure	Minimum Freeboard		
	Normal operation (m)	Design flood conditions (m)	Actual minimum freeboard (m)
Whale Tail Dike	2.0	1.8	2.0
Mammoth Dike	No water	1.3	1.5
Whale Tail WRSF Dike	No water	0.6	0.7
Northeast Dike	No water	0.7	0.8
IVR D-1, D-2, D-3 Dikes	TBD	TBD	TBD

m = metre; WRSF = Waste Rock Storage Facility;

Based on past experience at dewatering operations (i.e. Vault Lake for Meadowbank operations), a WTP was not required because the regulatory criteria limit was reached without treatment or a WTP was used only 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.

In the same way, approximately 2/3 of the dewatered water from Lake A53 would be pumped and directly discharged to Whale Tail Lake (South Basin), prior to operations of the IVR Attenuation Pond in April 2022. The remaining 1/3 of the water will be processed through the TSS/As WTP during open water conditions. The IVR Attenuation Pond is intended to manage all contact water from 2022 to closure while discharging through the TSS and As WTP during open water conditions. During new dike construction, Agnico Eagle will abide by limits established by the NWB in the Water License 2AM-WTP1826.

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 collections ponds and be pumped to the Whale Tail Attenuation Pond prior to being pumped to the active attenuation pond (i.e. IVR Attenuation Pond) after May 2022. 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 as per Part I, conditions 15 and 16 of the Water License 2AM-WTP1826, and incorporated in the Water Balance.

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 the Water License 2AM-WTP1826requirements. 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 by the OMS Manual issued 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 and as per the OMS Manual requirements. 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 decommissioned and opened to reconnect lakes.

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.

IVR D-1, D-2, D-3 Dikes will be decomissionned at the end of operations, after IVR attenuation pond is backfilled with clean NPAG-NML waste rocks.

The Whale Tail WRSF Dike will remain in place during closure 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, as required.

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 closure plan including specific water management components 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 (Golder 2019a).

Water management during closure and reclamation will involve actively filling the underground facilities and IVR Pit, and passively allowing the Whale Tail Attenuation Pond and the Whale Tail Pit to flood. The Groundwater Storage Ponds and IVR Attenuation Pond will be emptied at the start of closure and backfilled with NPAG/NML waste rock. The Whale Tail and IVR WRSFs will be progressively covered with NPAG/NML waste rock throughout operations and are expected to be completely covered at the beginning of closure. Contact water management systems will remain on site until monitoring results demonstrate that water quality is acceptable for discharge of all contact water to the environment without further treatment. Once the pit lake water quality meets the discharge criteria, the water management systems will be decommissioned to allow the water to naturally flow to the receiving environment. In 2018, a Whale Tail WRSF seepage analysis and Hydrodynamic modelling of Mammoth Lake were conducted to address NIRB project certificate Term and Condition no. 6a. The objectives were to assess Mammoth Lake near-field water quality at WRSF seepage outlet post-closure and to evaluate seasonal water circulation patterns in Mammoth Lake resulting from effluent discharge. In addition, a mine site and downstream water quality model was completed to predict and evaluate the water quality within Mammoth lake during operations and post-closure (Golder 2019c).

Results show that no modification to the water management strategy are needed concerning closure activities and sequence. Runoff from the Whale Tail WRSF and discharge from Whale Tail Lake (North Basin) (IVR runoff flows to Whale Tail Lake (North Basin)) will enter and mix in Mammoth Lake. Concentrations outside the mixing zone of the Whale Tail WRSF contact water plume are predicted to meet receiving water quality criteria. Results of the studies showed that baseline drainage patterns of East Sector needs to be re-establish to direct runoff towards the Whale Tail Attenuation Pond,

including runoff over the backfilled IVR Attenuation Pond. Runoff from the IVR WRSF and the backfilled Groundwater Storage Ponds need to be passively direct to the Whale Tail Pit. Exposed pit wall in the IVR pit will need to be resloped and capped with NPAG/NML material to avoid potential constituent release from IVR pit walls. composed primarily of south komatiite and basalt with some north greywacke rock. Based on these predictions, a control mechanism will be implemented for IVR Pit walls including re-sloping and cover placement.

The dewatered Whale Tail Pit and IVR Pit area will be filled with a combination of natural runoff and contact water from the entire site (i.e., the Whale Tail and IVR WRSF Contact Water Collection Systems and the Whale Tail and IVR Attenuation ponds), and water pumped from Whale Tail Lake (South Basin). The runoff and seepage from the Whale Tail WRSF and IVR WRSF will continue to be collected in the designated collection ponds and pumped to Whale Tail Lake (North Basin) during active closure (re-filling). Water will be monitored during flooding and until results demonstrate that water quality conditions from the WRSFs are acceptable for direct discharge. Based on the cover thermal model results, the Whale Tail WRSF and IVR WRSF will be covered with a cover of 4.7 m thick to be constructed with NPAG/NML waste rock. The intent of the cover is to contain the yearly active layer inside the thickness of the cover and to maintain a temperature below 0° Celsius for the underlying rock. The objective of the cover is the control of acid generating reactions and of migration of contaminants by freezing. Consistent with the Approved Project, the segregation of the PAG/NPAG and ML/NML waste rock will occur during the operation of the mine.

The key water management activities during mine closure are summarized in Table 3-7. Figures B15 to B20 in Appendix B show the water management flowsheets during mine closure phases.

Table 3.11 Key Water Management Activities during Mine Closure

Mine Year	Figure	Key Water Management Activities and Sequence
Year 8 (2026)	B.16	• Dewater the Groundwater Storage Ponds and the IVR Attenuation Pond to the underground mine • Backfill the the Groundwater Storage Ponds and the IVR Attenuation Pond with NPAG/NML waste rock • Draw-down of the raised Whale Tail Lake (South Basin) to 153.5 masl, pumping to the underground until refilled and then to the IVR Pit. Lake A55, Lake A65, Lake A62, Lake A63, Lake A18, Pond A-P23, Lake A20, Lake A21, Lake A22, and Lake A45 return to baseline elevations. • Water from Whale Tail Lake (South Basin) ceases flow through South Whale Tail Lake Diversion Channel and to Lake A16 (Mammoth Lake) • Decommission IVR Diversion to re-establish baseline drainage patterns of the Northeast Sector catchment towards the IVR Pit • Pump WRSF Pond water to the IVR Pit • Pump Whale Tail Lake (South Basin) to the IVR Pit during summer months to maintain its elevation at 153.5 masl • Re-establish baseline drainage patterns of East Sector runoff towards the Whale Tail Attenuation Pond, including runoff over the backfilled IVR Attenuation Pond • The Whale Tail Attenuation Pond overflows (once full) into the Whale Tail Pit • Passively direct runoff from the IVR WRSF and the backfilled Groundwater Storage Pond to the Whale Tail Pit • Runoff from the backfilled Groundwater Storage Ponds flow to the Whale Tail Pit • Start of site water quality monitoring of flooding open pit reservoirs
Year 9 to Year 21 (2027 to 2041)	B.17	• Refilling of the IVR Pit to 149.3 masl (i.e., the spill elevation of the IVR Pit onto the bed of Whale Tail Lake [North Basin]) expected in 2027; • The IVR Pit reaches the spill elevation to the Whale Tail Pit and begins overflowing to the Whale Tail Pit • A sill will be constructed at closure on the upstream of Mammoth Lake to increase the water level by 1 m to 153.5 m.
Year 22 (2042)	B.18	• The Whale Tail Pit reaches the spill elevation that connects it with the Whale Tail Attenuation Pond and both water bodies fill simultaneously. • The Whale Tail Pit and the Whale Tail Attenuation Pond reach the spill elevation that connects the Whale Tail Pit with the IVR Pit, and all three reservoirs fill simultaneously to 153.5 masl, forming Whale Tail Lake (North Basin) • Once Whale Tail Lake (North Basin) is flooded to 153.5 masl, pumping of the Whale Tail Lake (South Basin) to Whale Tail Lake (North Basin) during summer months will be on-going to maintain the elevation of Whale Tail Lake (South Basin) to 153.5 masl until water quality allows to decommission the dikes and reconnect the North and South Basins of Whale Tail Lake • Once Whale Tail Lake (North Basin) is flooded to 153.5 masl, remove STP

Mine Year	Figure	Key Water Management Activities and Sequence
		• Once Whale Tail Lake (North Basin) is flooded to 153.5 masl, decommission the Whale Tail WRSF Dike and re-establish natural drainage patterns of the Whale Tail WRSF Sector Lake A16 (Mammoth Lake) • Once Whale Tail Lake (North Basin) is flooded to 153.5 masl, create spillway in Mammoth Dike to re-establish baseline flow patterns to Lake A16 (Mammoth Lake) • Decommission the Whale Tail Dike, water quality permitting (triggered when water quality in all three water bodies meets the appropriate water quality criteria) • Remove site infrastructure
Post-Closure 2043+	B.20	• Monitoring, if required

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

3.3.1 Flooding Sequence

Flooding sequence will be adapted to meet water quality closure objectives to allow for the reconnection of the lakes. Both water balance and water quality forecast will be updated during operations and closure phases in order to optimize the flooding sequence.

The Whale Tail Pit will be filled with a combination of natural runoff and contact water from the entire site. The Underground mine and the and IVR Pit will be filled with a combination of natural runoff and contact water from the entire site and water pumped from Whale Tail Lake (South Basin). Flooding will begin following the end of operations.

Beginning in 2026, the water accumulated in Whale Tail Lake (South Basin) over the years of operations will be pumped into the underground mine until it is filled and into the IVR Pit thereafter. Active closure will be consistent with the Approved Project and current Type A Water Licence 2AM-WTP1826. Whale Tail Pit active closure will be followed by passive closure measures until the pits and underground have flooded, Whale Tail Lake and IVR Pit water levels are restored, and runoff from the WRSFs are shown to be suitable for uncontrolled release.

The Whale Tail Pit operations will be closed and reclaimed in a manner consistent with the Approved Project and as required under Project Certificate No. 008 and Type A Water Licence 2AM-WTP1826.

It is anticipated that approximately 47,000,000 m^3 over 16 years from Whale Tail Lake is required to fill the mined-out Whale Tail Pit (i.e., approximately 55,000,000 m^3), IVR Pit (i.e., approximately 10,000,000 m^3), underground mine (i.e., approximately 1,000,000 m^3) and Whale Tail Lake (North Basin) (i.e., approximately 6,000,000 m^3), including representing approximately 2,900,000 m^3/year from Whale Tail Lake (South Basin).

Following the first pumping summer, the water elevation in Whale Tail Lake (South Basin) will be back to the baseline value (153.5 masl) and no outlets will be available for this basin as the Whale Tail Lake (South Basin). The elevation of the Mammoth sill will be 153.5 masl. East Channel is at the elevation

156 masl and the Whale Tail Dike is maintained in place. Refilling of the IVR Pit to 149.3 masl (i.e., the spill elevation of the IVR Pit onto Whale Tail Lake (North Basin) expected in 2027. Refilling of Whale Tail Pit to 146.3 masl (i.e., the spill elevation of the Whale Tail Pit onto the bed of Whale Tail Lake (North Basin) expected in 2039.

3.3.2 Contact Water Collection System

The contact water collection system will remain in place to collect surface runoff water and seepage from the mine site until the open pits are flooded. During this period, 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). The Mammoth Dike and Whale Tail Dike will remain in place until pit lake water quality meets receiving environment water quality objectives. If this occurs after full flooding as is prectived at this time, the pit lake water elevation will be maintained at 153.5 masl by pumping from Whale Tail (South Basin)to the North Basin, and through controlled discharge from Whale Tail (North Basin) to Mammoth Lake over the Mammoth sill.

In the Whale Tail WRSF Sector, the contact water collection system will remain in place. Dikes will not be reconnected until the water quality in the flooded area meets appropriate site specific water quality objectives. Contingency for water treatment if required in closure is also accounted for in the closure plan.

In closure, water from the Whale Tail WRSF Contact Water Collection System is used to actively flood IVR Pit, and the IVR WRSF water is directed to Whale Tail Pit. In post-closure, water from the Whale Tail WRSF Contact Water Collection System is allowed to flow passively to Mammoth Lake as baseline drainage patterns are re-established through a weir. Lower volumes and chemical loading of water originating from either of the WRSFs would improve water quality throughout closure in Whale Tail and IVR Pits, and in Mammoth Lake in post-closure.

Dike decommissioning will involve the removal (breach) of a portion of the dike to original ground levels whenever possible. 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.

Water collection and management systems 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.

3.3.3 Post-Closure Modeling Results Summary

Following refilling of Whale Tail Lake (North Basin) to 153.5 masl (i.e., to overtop the Mammoth Lake sill), and once the pit lake water quality is acceptable (full flooding predicted to occur in 2042; adequate water quality in 2042; Golder 2019c), the Whale Tail Dike, Mammoth Dike, and the Whale Tail WRSF Dike are decommissioned. Whale Tail Lake (North Basin) and Whale Tail Lake (South Basin) form Whale Tail Lake with a water surface area of 2.34 km2, or a 41% increase from baseline, which flows to Lake A16 (Mammoth Lake) over the Mammoth Lake Dike via spillway. Runoff from the Whale Tail WRSF Contact Water Collection System area flows to Lake A16 (Mammoth Lake).

The reflooding strategy will be adapted during closure based on future water quality predictions validated with site monitoring data. The objective will be for pit lake water to meet quality objectives concurrently with completed reflooding such that lake reconnection can happen as soon as possible after thereafter.

Steady-state untreated WRSF contact water released is predicted to meet SSWQO for arsenic at the edge of the mixing zone in the long-term, under the anticipated cover performance scenario (from the 4.7 meters cover of low arsenic leaching waste rock).

The mixing zone in the Lake is predicted to range from 5 meters (under calm conditions in July when 6% of the seasonal seepage flow occurs), to 60 meters (under medium current conditions in June when 65% of the seasonal flow is predicted to occur at a more dilute arsenic concentration) from the entry point of this seepage into the Lake and along the plume centre line.

Other inflows to Mammoth Lake include natural runoff and overflow from Whale Tail Lake; both of these are predicted to meet SSWQO as described in FEIS Appendix 6H (Agnico Eagle, 2016). The revised version of the Water management Plan is enclosed with this response package.

Mammoth Lake is sensitive to cover material seepage quality, in turn sensitive to cover composition and WRSF pile contact water volume. Observational data at Meadowbank WRSF suggest that pile contact water volumes are substantially lower than originally predicted (Portage is 20 to 40% lower, Vault WRSF contact water is minimal compared to 178,000m^3 predicted at maximum footprint year) using similar modelling assumptions. Recent modelling results of the WRSF landform reflect a significant reduction in the volume of seepage from the WRSF and conservative chemical load estimate to Mammoth Lake which will be verified with monitoring. As per Type A Water Licence 2AM-WTP1826 Part E, conditions 7 and 8 , Agnico Eagle anticipates a site wide water balance and pit water quality model update will be required for the Whale Tail Pit Site as part of the annual water management plan.

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 (Addendum Volume 6, Appendix 6-O) and under closure conditions (Whale Tail Interim Closure and Reclamation Plan, 2019).

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:

- Precipitation was adjusted for undercatch using a factor of 1.15 for rainfall, and 1.55 for snowfall following previous studies;
- Frozen conditions were assumed from October to May;
- Rainfall during frozen conditions, as defined above, was applied as rainfall during the month of June of the same year if fallen between the months of January and May, or during the month of June of the following year if fallen between the months of October and December;
- Snowfall outside of frozen conditions, as defined above, was applied as rainfall during the same month; and
- Infiltration losses were assumed to be negligible in natural areas based on permafrost conditions.

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 monthly volumes during operations and closure phases are included in the 2019 Mean Annual Water Balance Update.

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APPENDIX A • YEARLY SITE LAYOUT PLANS