

## **Appendix 13**

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### **2022 Whale Tail Water Management Plan Version 10**

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# **AGNICO EAGLE**

**Meadowbank Division**

**WHALE TAIL MINE**

## **Water Management Plan**

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**MARCH 2023**

**VERSION 10**

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## EXECUTIVE SUMMARY

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Agnico Eagle Mines Limited – Meadowbank Division (Agnico Eagle) is developing the Whale Tail Mine (Project), a satellite deposit located on the Amaruq property, to extend mine operations and milling at Meadowbank Mine. In 2020 the Whale Tail Expansion Project (Expansion Project) was approved, permitting Agnico Eagle to expand and extend the Whale Tail Mine operations to include a larger Whale Tail open pit, development of the IVR open pit, and underground operations while continuing to operate and process ore at the Meadowbank Mine. In 2021 a positive conformity determination application was issued by the Nunavut Planning Commission for pushbacks on the IVR and Whale Tail pits (Pushback Project).

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

The open pit mine, mined by truck-and-shovel operation, includes four development phases: 1 year of construction (complete), 7 years of mine operations, 17 years of closure, and the post closure period. On September 30<sup>th</sup>, 2019, commercial production began at the Whale Tail Pit. The Pushback Project includes mining an additional 0.8 million tonnes of ore from the Whale Tail Pit and the IVR Pit pushbacks. It also produces an additional 7.5 Mt of waste rock. In total, the ore milling period for the Whale Tail project is over approximately an eight-year period from 2019 to 2026.

The water management objectives for the Project are to minimize potential impacts to the quantity and quality of surface water at the mine site. Water management structures (water retention dikes/berms and diversion channels) have been and 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. The major water management infrastructure includes contact water collection ponds, diversion channels, water retention dikes, culverts, seepage collection systems, water treatment plants for effluent, a potable water treatment plant, a sewage treatment plant, and discharge diffusers.

This Water Management Plan for the Project describes the main objectives pertaining to water management, which are to limit 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 separated as much as possible.
- control and minimize contact water through diversion and containment.

- minimize freshwater consumption by recycling and reusing the contact and process water wherever feasible; and
- meet discharge criteria before any site contact water is released to the downstream environment.

During mine construction and operations, contact water originating from affected areas on surface is intercepted, diverted, and collected within the various collection ponds. The collected water on the mine site is pumped and stored in the Whale Tail Attenuation Pond and IVR Attenuation Pond, where the contact water is treated by the Water Treatment Plant (WTP) (as required according to water quality) prior to discharge to the receiving environment or reused in the operations.

During operations, site contact water quality is predicted to exceed established effluent criteria (i.e., under the Whale Tail Water Licence (2AM-WTP1830)) in the Whale Tail Waste Rock Storage Facility (WRSF) Pond and in the Whale Tail Pit sump. Therefore, this water is controlled by the Whale Tail WRSF Dike and the Whale Tail WRSF Pond. The Whale Tail WRSF Pond water will report with all other contact water and will be mixed in the Whale Tail and IVR Attenuation Ponds and treated during operations.

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. A site wide water balance will be updated yearly, and end pit water quality modelling will be updated yearly 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. The pushback in IVR pit will be backfilled with NPAG-non-ML rock material and filled by natural flow. 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. Through best management practices and mitigation, the predicted water quality of Whale Tail Lake (North Basin) meets aquatic life guidelines post-closure. The projected water quality in Mammoth Lake is predicted to meet guidelines in post-closure for all constituents of potential concern (including chloride, fluoride, nitrate, and total selenium, as identified in the 2018 FEIS), with the exception of chromium, iron, and phosphorus.

The updated water quality data shows a stable trend in the water quality indicators. At closure and post-closure, flooded pit water quality is predicted to meet receiving water quality criteria when flooding is complete, allowing reconnection with the downstream receiving environment.



Dikes will not be breached until the water quality in the flooded area meets the approved water quality objectives. During mine closure, no mine discharges will occur to the downstream receiving environment since all contact waters are diverted to the open pit, underground and Whale Tail Lake (North Basin) for re-flooding.

**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	March 2020	All	All	Updated to reflect current operations/water mgmt and to comply with commitments and requests	Agnico Eagle Meadowbank Division
5	July 2020	All	All	Water Management Plan for the Whale Tail Pit – including Expansion Project	Agnico Eagle Meadowbank Division
6	April 2021	All	All	Updated to reflect current operations/water mgmt and to comply with commitments and requests	Agnico Eagle Meadowbank Division
7_NWB	June 2021	Summary  3.7.12 3.10 5.0 Appendices	i-ii  33 42 49 N.A.	Updated to include Pushback Project Added new section Figure on pushback in IVR Adaptive Mgmt Updated WQ models	AEM – Permitting & Regulatory Affairs (all changes)
8	December 2021	3.4 3.8	17 37	Clarification on wording for source of water use for emulsion plant	Agnico Eagle Meadowbank Division
9	March 2022	All	All	Updated to reflect current operations/water mgmt and to comply with commitments and requests	Agnico Eagle Meadowbank Division
10	March 2023	3.1, 4	All	Section 3.1 water management targets, Section 4 water quality forecast update	Agnico Eagle Meadowbank Division

Approved by:



Eric Haley – Environment & Critical Infrastructure Superintendent

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Appendix B	Water Management Schematic Flow Sheets
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**ACRONYMS**

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Agnico Eagle	Agnico Eagle Mines Limited – Meadowbank Complex
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
NE	North-East
OMS	Operation, Maintenance, and Surveillance
PGA	Peak Ground Acceleration
Plan	Water Management Plan
Project	Whale Tail Mine
Pushback Project	Whale Tail and IVR Pit – Pushback Expansion Project
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
WT	Whale Tail
WTSC	Whale Tail South Channel

## UNITS

±	plus or minus
<	less than
%	percent
°C	degrees Celsius
°C/m	degrees Celsius per metre
km	kilometre(s)
km <sup>2</sup>	square kilometre(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 <sup>3</sup>	cubic metre(s)
m <sup>3</sup> /day	cubic metres per day
m <sup>3</sup> /hour	cubic metres per hour
m <sup>3</sup> /year	cubic metres per year
Mm <sup>3</sup> /year	million cubic metre(s) per year
Mm <sup>3</sup>	million cubic metre(s)
t	tonne
Mt	million tonne(s)



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**SECTION 1 • INTRODUCTION**

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Agnico Eagle Mines Limited – Meadowbank Division (Agnico Eagle) is currently operating the Whale Tail Mine (Project), a satellite deposit located on the Amaruq property, and continues to feed the mill at Meadowbank Mine. In 2020 the Whale Tail Expansion Project (Expansion Project) was approved, allowing Agnico Eagle to expand and extend the Whale Tail Pit operations to include a larger Whale Tail open pit, development of the IVR open pit, and underground operations while continuing to operate and process ore at the Meadowbank Mine.

In 2021 a positive conformity determination application was issued by the Nunavut Planning Commission for pushbacks on the IVR and Whale Tail pits (Pushback Project). A pushback is a discrete zone of an open pit mining operation that can be mined continuously.

The Amaruq property is a 408 square kilometre (km<sup>2</sup>) site located on Inuit Owned Land approximately 150 kilometres (km) north of the hamlet of Baker Lake and approximately 50 km northwest of Meadowbank Mine in the Kivalliq Region of Nunavut. The deposit will 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 open pits and underground mine, mined by truck-and-shovel operation, includes four development phases: 1 year of construction (complete), 7 years of mine operations, 16 years of closure, and the post closure period. The ore milling period for the Whale Tail project is planned over an eight-year period, from 2019 to 2026.

The construction and preparation of material started in summer 2018 after all permits and authorizations were received, and construction of the dikes 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 continued in 2018 and 2019. On September 30<sup>th</sup>, 2019, commercial production began.

Waste rock and overburden will be stored in the Waste Rock Storage Facility (Whale Tail WRSF and IVR WRSF) and ore will be stockpiled on the ore pads. Some NPAG-NML material will also be stored in the IVR pit pushback. The waste rock storage footprint, water management infrastructure, and camp have been designed and consider up to eight years of production to allow for expected resource growth. The underground WRSF (AP-5 location) that was permitted under the Type B will be expanded and became a facility regulated under the Type A Water Licence (2AM-WTP1830). Agnico Eagle will increase the footprint of the underground 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).

As per the Interim Closure and Reclamation Plan (ICRP), closure will occur from Year 8 (2026) to Year 26 (2044) after the completion of milling and will include removal of the non-essential site infrastructure and filling of the mined-out open pits and underground mine as well as reestablishment of the natural Lake A17 (Whale Tail Lake) level. Only essential infrastructure related to water treatment will remain on site during the closure and post-closure phases. 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 the Whale Tail Pit Interim Closure and Reclamation Plan). Post-closure is expected from Year 26 (2044) onwards. The closure schedule for the overall Project is based on the preliminary closure methods and strategies discussed in the Whale Tail ICRP. It is anticipated that the schedule will be refined throughout the Project life as the designs are advanced, and the closure methods and strategies are further developed. Site and surrounding environment monitoring started from the beginning of the construction and will 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	<ul style="list-style-type: none"> <li>Construct site infrastructure</li> <li>Develop open pit mine</li> <li>Stockpile ore</li> </ul>
Operations	Year 1 to 7	<ul style="list-style-type: none"> <li>Open pits operations</li> <li>Underground operations</li> <li>Transport ore to Meadowbank Mine</li> <li>Stockpile ore</li> <li>Discharge Tailings in Meadowbank TSF</li> </ul>
	Year 8	<ul style="list-style-type: none"> <li>Complete transportation of ore to Meadowbank Mine</li> <li>Complete discharge of tailings in Meadowbank TSF</li> </ul>
Closure	Year 9 to 26	<ul style="list-style-type: none"> <li>Remove non-essential site infrastructure</li> <li>Flood mined-out open pits and underground operations</li> <li>Re-establish natural Whale Tail Lake level</li> </ul>
Post-Closure	Year 27 onwards	<ul style="list-style-type: none"> <li>Site and surrounding environment monitoring</li> </ul>

TSF = Tailings Storage Facility

This document presents the Water Management Plan (Plan) for the Project in accordance with Part E Item 5 of the Nunavut Water Board (NWB) Water License 2AM – WTP1830 including modifications stemming from the Pushback Project. It is a requirement of the License that an updated Water Management Plan be submitted on an annual basis following the commencement of Operation. The Plan must include an updated Water Balance and actions to be implemented if predicted re-flooded pits water quality indicate that water treatment is necessary.

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**SECTION 2 • BACKGROUND INFORMATION**

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**2.1 Site Conditions**

The general mine site location for the Project is presented in Figure 2.1.

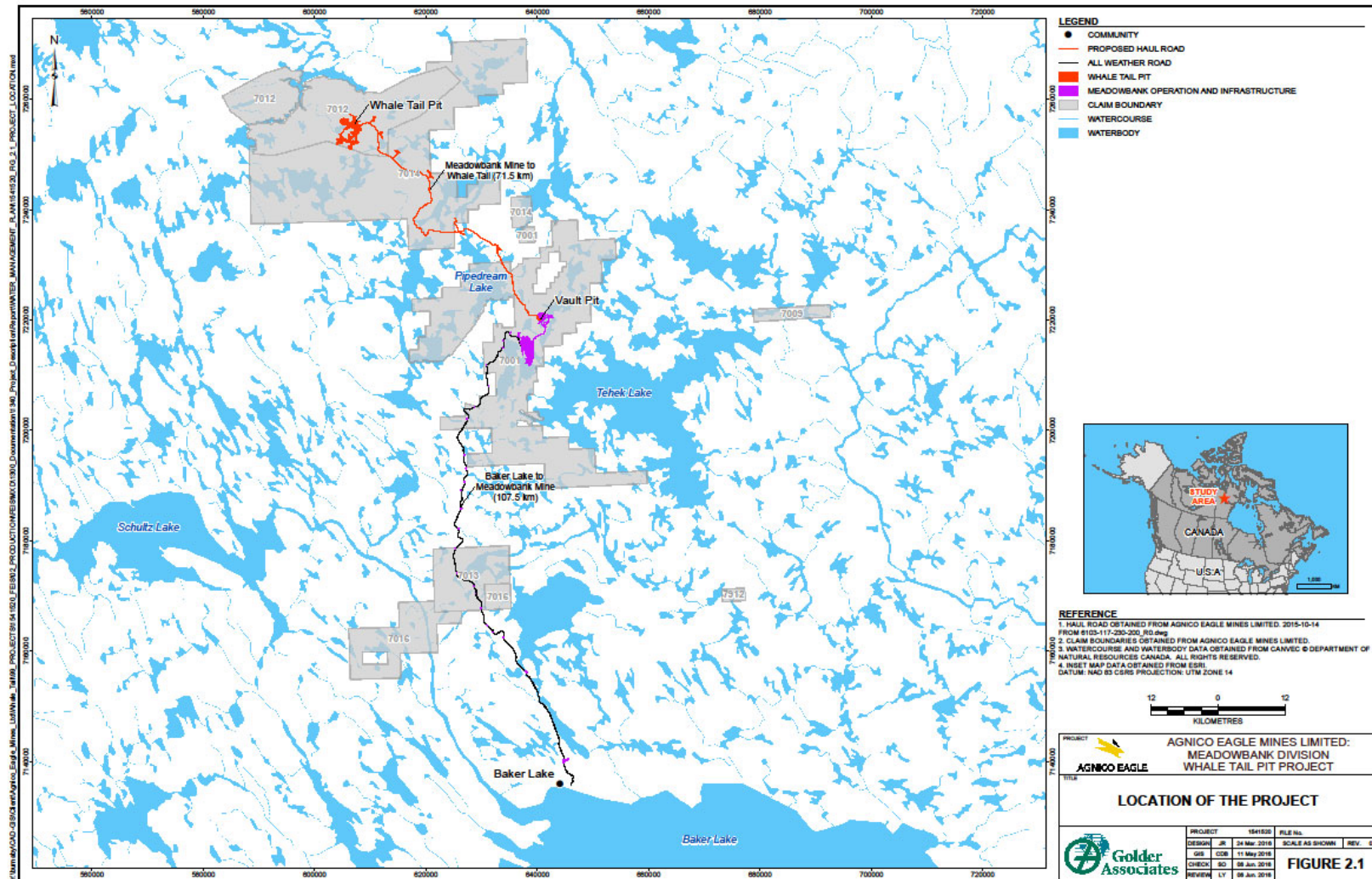
**2.1.1 Climate**

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

The Project is 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 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 Project are presented in Table 2.2, based on intensity-duration-frequency curves available from the Baker Lake A meteorological station (Station ID 300500) operated by the Government of Canada (2015).

Figure 2.1 Location of the Project



**Table 2.1 Estimated Mine Site Monthly Mean Climate Characteristics**

Month <sup>a</sup>	Mean Air Temp. (°C) <sup>a</sup>	Monthly Precipitation (mm) <sup>a</sup>			Losses <sup>a</sup>		
		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

<sup>a</sup> SNC (2015).

°C = degrees Celsius; mm = millimetre.

**Table 2.2 Estimated Mine Site Extreme 24-Hour Rainfall Events**

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

<sup>a</sup> SNC (2015).

mm = millimetre.

## 2.1.2 Permafrost and Hydrogeology

### 2.1.2.1 Permafrost Conditions and Assessment

Thermal assessments have been completed that contribute to the understanding of the permafrost conditions near the Whale Tail Pit, IVR Pit, and Underground Mine. An update of the Whale Tail Thermal Assessment was conducted in April 2019 (Golder 2019b). The thermal assessment evaluated 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 well sampling) that took 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 at depth.

The mine site is located in an area of continuous permafrost, as shown on Figure 2.2. Based on measurements of ground temperatures (Knight Piésold 2015), the depth of permafrost at the mine site is estimated to be in the order of 425 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 report *Hydrogeological Assessment and Modelling Whale Tail Pit - Expansion Project* (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).
- 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).
- 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 model 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 Whale Tail Pit are located within unfrozen rock, the IVR Pit and the Underground Project are fully contained within permafrost as per current planning. Groundwater inflow is therefore only expected during operations in the Whale Tail Pit.

Mining of the Whale Tail Pit occurs within the talik underlying Whale Tail Lake, whereas the latest version of the Underground Project is located in permafrost. The Underground is not directly connected to either Whale Tail Pit or IVR Pit.

During mining, the Whale Tail Pit will act as a sink for groundwater flow, with seepage faces developing along portions of the pit walls. In response to the deepening of the mine workings, groundwater will be induced to flow through bedrock to the Whale Tail Pit. Mine inflow will originate primarily from Whale Tail Lake (South Basin), the Whale Tail Attenuation Pond, and deep bedrock underlying the permafrost.



Figure 2.2 Permafrost Map of Canada

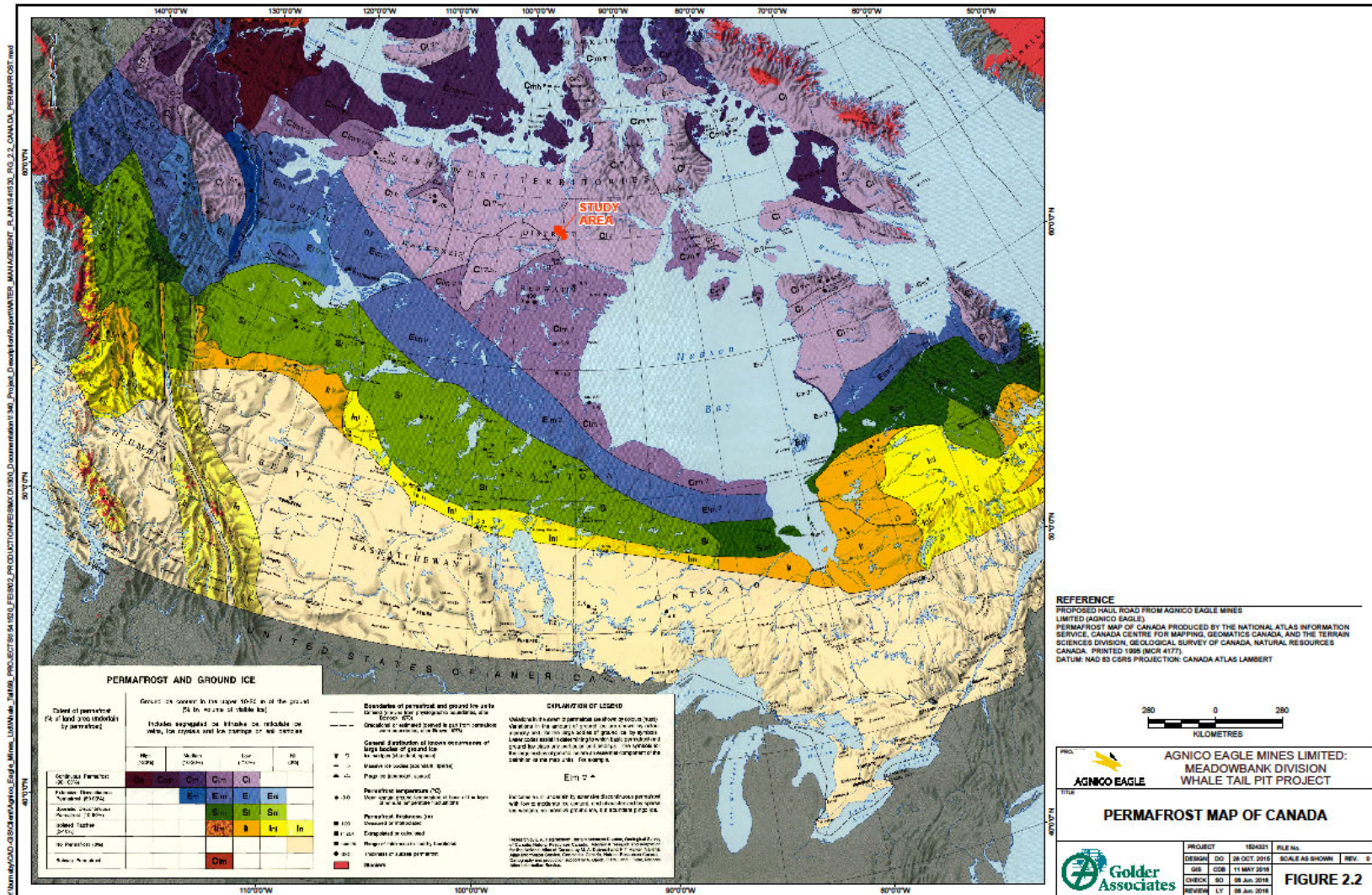
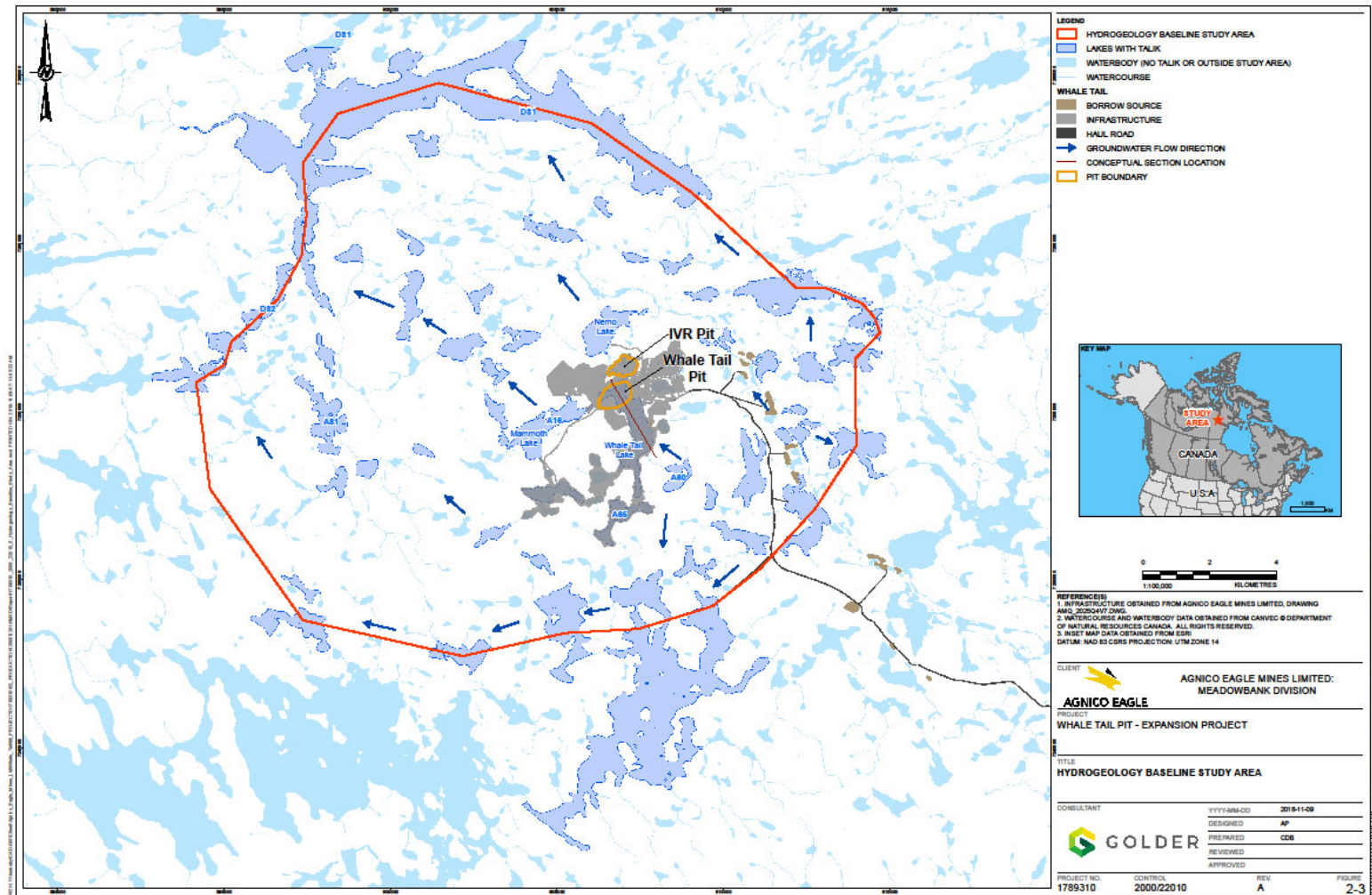




Figure 2.3 Hydrogeology Baseline Study Area



### 2.1.3 Hydrology and Watershed

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

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

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

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

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

### 2.1.4 Surface Water Quality

Water quality characteristics were extracted from the water quality baseline report (FEIS, Volume 6, Appendix 6-G, Agnico Eagle, 2016) and the water quality impact assessment section (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, most 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 (FEIS, 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, and 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 in an area of relatively low seismic risk. The peak ground acceleration (PGA) for the area was estimated using the 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](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 Open Pit, IVR Open Pit, and Underground mining will be mined using the 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 2025, while milling will continue through 2026.

Two mine waste streams will be produced at Whale Tail Pit: waste rock and overburden. 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 Whale Tail Mine – Waste Rock Management Plan, Agnico Eagle, 2023a). The operation, management, and monitoring of the Meadowbank TSF is regulated under the Agnico Eagle Type A Water Licence 2AM-MEA1530.

The mine development includes the following 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
- two open pits

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 is a summary of the mine waste management plan. More detailed information on mine waste management is presented in the Whale Tail Mine – Waste Rock Management Plan, Agnico Eagle, 2023a. Water management associated with mine waste management is described in Section 3 of this document. Two areas of the site were identified as the Whale Tail WRSF and the IVR WRSF to store waste rock and overburden material, as shown in Appendix A. Table 2.3 presents a summary of the proposed usage or destination for the waste material. Some material will also be stored in the IVR pit pushback.

**Table 2.3 Summary of Mine Waste Destination**

Mine Waste Stream	Waste Destination
Overburden	<ul style="list-style-type: none"> <li>• Temporary storage West of Whale Tail Lake</li> <li>• Co-disposed with waste rock in Whale Tail WRSF</li> </ul>
Waste Rock	<ul style="list-style-type: none"> <li>• Construction material</li> <li>• Whale Tail WRSF and IVR WRSF</li> <li>• Underground backfill material</li> <li>• IVR Pit Pushback backfill material</li> <li>• Closure and site reclamation, fish habitat compensation</li> </ul>
Tailings	<ul style="list-style-type: none"> <li>• As slurry tailings placed in the approved Meadowbank Mine tailings storage facility</li> </ul>

WRSF = Waste Rock Storage Facility

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**SECTION 3 • WATER MANAGEMENT AND WATER BALANCE**

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**3.1 Water Management Objectives and Targets**

The main objectives pertaining to water management for the 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 water to the extent practical
- Meet discharge criteria before any site contact water is released to the downstream environment
- No events of non-compliance with regards to:
  - Regulatory/Water License water quality criteria (effluent loading limits)
  - Regulatory/Water License freshwater withdrawal criteria

The water management targets are summarized in Table 3.1. These targets are aligned with the water objectives of the Whale Tail Project and go beyond the License limit. These targets strive to minimize risk, conserve freshwater, and minimize water usage. The 2023 targets assume continued improvements in the amount of contact water withdrawn from the Pit. Higher production rates in 2023 will require slightly more fresh water withdrawn from Nemo Lake, more contact water withdrawn from Underground as the works expand, and more water discharged from site.

**Table 3.1 2023 Targeted Water Hourly Consumption Per Month – for Mill and Camp Usage**

WATER OBJECTIVE	TARGET 2021	TARGET 2022	TARGET 2023
Fresh Water Withdrawn from Nemo Lake (Mining and Camp)	85,284 m <sup>3</sup>	75,000 m <sup>3</sup>	80,000 m <sup>3</sup>
Contact Water Withdrawn from Pit (pit inflow)	761,820 m <sup>3</sup>	910,827 m <sup>3</sup>	915,000 m <sup>3</sup>
Contact Water Withdrawn from Underground (inflow)	0	3,000 m <sup>3</sup>	16,000 m <sup>3</sup>
Water discharge from site (WTS / Mammoth Lake)	2,244,538 m <sup>3</sup>	2,488,068 m <sup>3</sup>	2,500,000 m <sup>3</sup>
Water in recirculation (water recycled / total water use)	0%	0%	0%

### 3.2 Water Management Strategy

To achieve the above water management objectives and targets, the following key strategies were implemented to develop the 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 Whale Tail Pit Attenuation Pond and the IVR Attenuation Pond.
- The IVR Attenuation Pond will contribute to reducing the operational water head in the Whale Tail Attenuation Pond.

- The collected water will be treated if the water quality does not meet the discharge criteria established in the Water Licence 2AM-WTP1830.
- The treated water will be reused as much as possible for mining and site operations 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 or pumping systems and will be allowed to flow or to be discharged to the neighbouring waterbodies.

Underground (UG) development groundwater and contact water will be pumped to distinct surface infrastructure for water management. The underground water management infrastructure was defined based on the following underground water management guideline principles:

- It is not currently planned to mine below the permafrost. It is an opportunity that will be further studied
- Heating is required when mining below top of cryopeg
- Brine needed until cryopeg elevation is reached
- Contact and non-contact UG water not segregated – segregation is an opportunity
- Grouting is a mitigation measure during development (not included in hydrogeological model)
- UG storage stope (used to recycle UG water) – will delay treatment, needed early
- Recirculation of brine during mining operations
- Limit addition of freshwater (used only for CRF [cemented rockfill], promote use of natural groundwater for operation)
- Treatment of UG saline water is not required if mining stays in the permafrost

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

- A Groundwater Storage Pond system (GSP) to store captured TDS (salt) affected waters. Up to three GSPs are planned to provide operational flexibility and adaptive management opportunity
- Excess water volumes in the underground mine will be managed through the Underground Mine Stope and GSP-1 and GSP-2. Excess water volumes may also be managed with GSP-3 planned for contingency, operational flexibility, and adaptive management opportunity
- There is opportunity for water stored in the GSP to be reused for dust suppression on surface roads or to be re-circulated underground (i.e., for drilling or mixing in the cemented rockfill)
- The Project has been planned with contingency water management storage to manage contact water during upset conditions. For example, GSP-3 could be used for temporary storage when not used for saline water management. This storage has sufficient capacity to manage the potential water quantity exceedances occurring during the freshet and can be used to hold excess contact water temporarily until it can be treated by the water treatment



- plant during the remaining open water season (July to September). During this time, at maximum capacity, the excess water can be treated and discharged within two weeks
- At the end of underground mining, any remaining water in GSP ponds will be pumped underground for flooding of the underground workings

### 3.3 Water Balance

As per the Type A Water Licence 2AM-WTP1830, Part E, Item 5, a Project water balance will be updated and presented on an annual basis, integrated into the water management plan update. The developed water balance will assist in evaluating future water management infrastructure, including under closure conditions (as per the Whale Tail Interim Closure and Reclamation Plan).

The water balance was computed on a monthly time step based on mean annual climate conditions (Section 2.1.1). The water management flow sheets are presented in Appendix B, and the water balance results are presented in Appendix C of this plan.

### 3.4 Waterbody Inventory

The A and C watersheds will be impacted by mining activities, primarily by dewatering of Whale Tail Lake (North Basin) to Lake A16 (Mammoth Lake), the Northeast Diversion to the C watershed, and the Whale Tail Lake (South Basin) Diversion to Lake A16 (Mammoth Lake). Waterbodies directly impacted by mining activities are presented in Table 3.2 and shown in Appendix A. Discharge of treated effluent began in the second dewatering phase of the project in June 2019 and will continue throughout mine operations and into closure if required, based on water quality monitoring and results.

**Table 3.2 Inventory of Waterbodies Directly Impacted by Mining Activities**

Watershed	Primary Disturbance	Waterbody	Note
A	Dewatering	Lake 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	Covered by IVR WRSF
		Lake A51	Covered by IVR WRSF
		Lake A52	Covered by IVR WRSF
		Pond A-P21	Covered by IVR WRSF
	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
		Lake A16 (Mammoth Lake)	Receives discharge of treated effluent
		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, if needed
		Lake C38 (Nemo Lake)	Sourced during operations, including emulsion plant
		Lake A17 (Whale Tail Lake)	Whale Tail Lake (South Basin) sourced during closure

### 3.5 Water Management System

The water management system includes the following components (identified in Appendix A):

- Water collection ponds (Whale Tail Attenuation, IVR Attenuation, Whale Tail WRSF, plus the GSP Ponds)
- Staging sump for Pit contact water management
- Sump for WRSF contact water management
- Discharge diffusers located in Mammoth Lake and Whale Tail South
- Two water diversion channels (South Whale Tail Channel and IVR diversion channel)
- Four water retention dikes (Whale Tail, Mammoth, Whale Tail WRSF, and the IVR dikes)
- Culverts
- Freshwater intake causeway and pump system
- WTP and associated intake causeway
- Sewage Treatment Plant (STP)
- Pipelines and associated pump systems
- Potable WTP
- Pumping system from Whale Tail South to Mammoth Lake
- Whale Tail Dike seepage collection system.

Additional water management system components can be put in place if required to adapt effectively to the site conditions, to manage non-contact water adequately, and to meet the water management objectives and target.

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 3.3 together with the 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. Final design details of these structures will be provided to the regulators for approval at least 60 days prior to construction.

Water management strategy updates were also communicated in August and September 2019 to the Nunavut Water Board regarding changes to the management of non-contact water for specific areas of the project. Those changes are reflected in Table 3.3.

Appendix A shows the location of the main structures at the different development stages of the mine life.

**Table 3.3 Water Management Facilities**

Mine Year	Water Management Facilities Constructed or Installed
Year -1 (2018) Construction	<ul style="list-style-type: none"> <li>• Turbidity Curtains installation for dike construction</li> <li>• Start Whale Tail Dike</li> <li>• Construction of the low-permeability access road built of overburden and collection sump for Stage 1 WRSF</li> <li>• Freshwater intake causeway in Nemo Lake</li> <li>• Water Treatment Plant and Construction Water Treatment Plant</li> <li>• Pipelines and associated pump systems for water management and dewatering</li> <li>• Sewage Treatment Plant</li> <li>• Potable Water Treatment Plant</li> <li>• Discharge diffuser in Mammoth Lake</li> <li>• Culverts 184, 186, and Mammoth Channel</li> </ul>
Year 1 to 2 (2019-2020) Operations – Phase 1	<ul style="list-style-type: none"> <li>• Completion of Whale Tail Dike</li> <li>• Construction of Mammoth Dike</li> <li>• Construction of the Whale Tail WRSF Dike</li> <li>• Construction of the Northeast Dike</li> <li>• Construction of the South Whale Tail Diversion Channel</li> <li>• Construction of the dewatering system (ramp, pipe, diffuser) for the Whale Tail North Basin to the Whale Tail South Basin, the dewatering system from North Basin to Mammoth Lake (and Water Treatment Plant).</li> <li>• Construction of the Whale Tail contact water intake causeway and construction of the WT attenuation pond infrastructure (diffuser, pipeline)</li> <li>• Installation of pumping system from the North-East Pond to C Watershed</li> <li>• Installation of pumping system from Whale Tail South to Mammoth Lake</li> <li>• Construction of the Whale Tail Dike seepage collection system</li> <li>• Installation of pumping system from A53 Lake to Whale Tail South</li> <li>• Installation of pumping system from Lake A49 to North-East Sector to maintain the water level</li> <li>• Installation of pumping system for contact water from the open pit to the Whale Tail Attenuation Pond (to Quarry 1 until freshet 2020)</li> <li>• Installation of pumping system for contact water from the Whale Tail WRSF Pond to the Whale Tail Attenuation Pond (to Quarry 1 until freshet 2020)</li> <li>• Underground WRSF saline ditch system</li> </ul>
Year 2 to 7 (2020-2025) Operations – Expansion Project	<ul style="list-style-type: none"> <li>• Construction of the dewatering system (ramps, pipes) for Lake A46, A47, A49, A50, A51, A52, A53, AP-21. Used to dewater the footprint of IVR Pit, IVR WRSF, and IVR Attenuation Pond</li> <li>• Dismantling of North-East Dike for IVR Pit mining activity</li> <li>• Construction of the contact water intake causeway and construction of the IVR attenuation pond infrastructure (diffuser, pipeline)</li> <li>• Installation of the IVR Attenuation Pond Pump Station</li> <li>• Installation of pumping system for contact water from the open pit to the IVR Attenuation Pond</li> </ul>

Mine Year	Water Management Facilities Constructed or Installed
	<ul style="list-style-type: none"> <li>• IVR WRSF Contact Water Collection System; Ore stockpile 3 Contact Water Collection System</li> <li>• IVR Diversion</li> <li>• IVR D-1 Dike</li> <li>• Underground Water Management System</li> <li>• Groundwater Storage Ponds</li> </ul>

WRSF = Waste Rock Storage Facility.

### 3.5.1 Infrastructure Summary

The following sections briefly describe the various dikes and channels constructed for the Project. Information regarding the operation, surveillance, and maintenance of these structures is contained in the OMS Manual – Whale Tail Water Management Infrastructures (Agnico Eagle, 2022a). Additional information regarding construction of these infrastructures including design drawings and figures, can be found in the as-built reports submitted for each structure.

Agnico Eagle will continue to identify and assess the water infrastructure performance issues to ensure efficient water management. A lesson learned exercise on the 2019 freshet was performed in 2020 and was used to improve water management practices and plans for 2020 and beyond. In 2022 a lesson learned exercise on the winter water management was performed to improve winter water management practices for future winters.

#### Whale Tail Dike

Whale Tail Dike (WTD) isolates the Whale Tail Pit and Whale Tail Attenuation Pond from Whale Tail Lake South. The WTD construction raised the 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). The South Whale Tail Channel is a diversion structure associated with this dike and diverts runoff downstream to the Lake A16 (Mammoth Lake).

WTD is approximately 835 m in length and was constructed within Whale Tail Lake on a shallow plateau of the lake floor. It consists of a wide rockfill shell, with downstream filters and a cement-bentonite cutoff wall built with secant piles that extend into the bedrock. The cutoff wall extends up to 12 m below lake level and is socketed an average 1.37 m in the bedrock. The dike has a 5 m grout blanket on the upstream side and a 10 m grout curtain on the downstream side from 0+180 to 0+516. The top of the secant piles are at El. 157 which is 1 m higher than the design IDF water level. A rockfill thermal cover 2.0 m thick was placed between the secant pile top elevation and the final crest elevation of the dike at 159 masl.

Whale Tail Dike was constructed in the fall of 2018 and its initial grout curtain was installed in the first quarter of 2019. During dewatering in 2019 it was observed that a high amount of seepage was coming from the structure. The amount was judged unsustainable to be managed by pumping (approximately 300 m<sup>3</sup>/h). A detailed investigation including additional instrumentation and

geophysics was conducted for a better understanding of the seepage phenomenon at the Whale Tail Dike. In 2020, a pumping system was installed to collect and manage the seepage water prior to reaching the Whale Tail Attenuation Pond with the objective of returning water to the environment if water quality allows.

As a result, a remedial grouting campaign was performed between November 2019 and March 2020. The campaign was successful and met the objective of decreasing the seepage so it could be manageable by pumping. Following the dike grouting campaign, the seepage flow, measured using a v-notch weir, has significantly decreased to approximately 80 m<sup>3</sup>/h and it was concluded that the seepage reduction objective of the grouting campaign was successfully reached. Agnico Eagle continues to closely monitor the situation.

### **South Whale Tail Diversion Channel**

The South Whale Tail Diversion Channel (SWTDC) is a blasted channel in the south-western part of the Whale Tail Lake watershed. It allows non-contact water to be discharged by gravity from Whale Tail Lake to Mammoth Lake.

The construction of SWTDC occurred from January to April 2020 and it was commissioned during the 2020 freshet.

The inlet of the SWTDC is at El. 155.3 m. The channel has a trapezoidal shape with lateral slopes of 3H:1V, a base width of 5.0 m, and a bed-slope of 0.3%. The SWTDC was constructed using a protective riprap layer consisting of rockfill on the bottom and the sides of the channel to avoid erosion and limit TSS in the water. The riprap has a thickness of 0.5 m and consists of blasted rock with a diameter of 100 – 300 mm. Two transition materials consisting of fine and coarse filter with a 0.3 m thickness each were installed between the overburden and the riprap for particle retention between the foundation soil and the riprap. A layer of geotextile was placed between the coarse filter and the riprap to avoid migration of fine particles from the filters that could increase turbidity. The part of the access road crossing Lake A45 was modified to add a filtering element to prevent the A45 lakebed sediment to flow in the channel and create turbidity while ensuring that water from Lake A45 could reach the channel.

### **Mammoth Dike**

Mammoth Dike is a water retaining infrastructure built to isolate the Whale Tail Pit from Mammoth Lake. Mammoth Lake receives water from Whale Tail Lake through the SWTDC and treated water from site discharge through the Mammoth Lake diffuser. Water flows out of Mammoth Lake through its natural outlet.

The construction of Mammoth Dike occurred from February 2019 to March 2019 to maintain the frozen condition of the foundation. Mammoth Dike has a length of about 330 m and a height of 2 m. This structure is a zoned rockfill dike with a filter system. The low permeability element of the dike consists of a bituminous geomembrane (BGM) installed on the upstream face anchored in a key trench with fine filter amended with bentonite (FFAB). The key trench is approximately 3 m deep and is founded on bedrock. Blasting was required during the construction of this infrastructure.

### Whale Tail WRSF Dike

WRSF Dike is a water retention infrastructure designed to prevent contact water from the Whale Tail waste rock storage facility (WRSF) accumulating in the WRSF pond from reporting to Mammoth Lake. The water collected in the WRSF pond located upstream of the dike is pumped to the Attenuation Pond and treated prior to being discharged. An area of approximately 109 ha drains towards the WRSF pond. The WRSF Dike is located south of the Whale Tail WRSF.

The WRSF Dike is about 360 m long and 5 m high. This structure is a zoned rockfill dike with a filter system. Foundation excavation in the key trench area was done in the fall of 2018 to avoid blasting and aggrade frost penetration. The construction of WRSF Dike mainly occurred from January to February 2019 to maintain the frozen condition of the foundation. The low permeability element of the dike consists of a bituminous geomembrane (BGM) installed on the upstream face anchored in a key trench with fine filter amended with bentonite (FFAB). The key trench is approximately 3 m deep and founded on frozen glacial till or bedrock.

On August 2019, the key trench of the structure thawed inducing tension cracks on the crest of the structure and seepage from WRSF Pond reported through the structure to Mammoth Lake. Immediate actions taken were to build an access road to the downstream portion of the dike, in order to excavate a small sump and pump the seepage water back into the WRSF Pond. Furthermore, WRSF Pond was emptied and maintained dry. Downstream pumping stopped on September 30<sup>th</sup>, when the reporting flow and surrounding area had frozen. In October 2019, the KIA conducted a sample analysis of the lakebed sediments in Mammoth Lake. The report concluded the seepage did not have a measurable impact on metal quantities of the Mammoth Lake sediments (McDougall et al. 2019).

A series of measures were implemented by Agnico to minimize the risk of future similar events occurring in this location:

- Operational water levels were reviewed to keep water as low as possible in the WRSF pond as recommended by the Meadowbank Dike Review Board (MDRB)
- Aggradation of permafrost into the dikes foundation by construction of a thermal berm in 2020 on the upstream portion of the dike
- Access road to the downstream area was constructed to facilitate inspection
- A downstream water collection system was designed and constructed

Additional details on this event can be found in the letter submitted on December 20, 2019, to Environment and Climate Change Canada. Agnico Eagle continues to closely monitor the situation. No seepage was observed since the 2019 event which confirmed the adequacy of the mitigation measures implemented to ensure adequate performance of the structure.

### Northeast Dike (dismantled)

The North East (NE) Dike was a temporary structure designed to prevent runoff from the Northeast watershed reporting to the Whale Tail Pit and to divert them to Nemo Lake. The upstream slope of

the NE Dike was lined with bituminous geomembrane encapsulated at the toe in a layer of FFAB liner in turn constructed in a key trench to an ice-poor till foundation.

Following the fish out and dewatering of surrounding lakes (A46 & A47) in 2020, this structure was dismantled as part of the IVR pit development.

#### **IVR Dike D-1**

IVR Dike D-1 is a contact water retaining infrastructure built to contain the IVR Attenuation Pond. It is located East of the Whale Tail Pit. The structure includes an emergency spillway to release the water to the Whale Tail Attenuation Pond.

The construction of IVR Dike D-1 was part of the expansion project. It started in Q1 2021 and was completed in Q2 2021. The structure was constructed as a zoned rockfill dike with a filter system. The low permeability element of the dike consists of a bituminous geomembrane (BGM) installed on the upstream face anchored in a key trench located below the centerline of the structure with fine filter amended with bentonite (FFAB). The key trench is excavated in frozen glacial till or bedrock. To improve the thermal condition of the key trench a rockfill and esker thermal berm was placed on the upstream side.

#### **IVR Diversion Channel**

The IVR Diversion Channel (IVR DC) is an excavated channel in the north-east part of the Whale Tail Project site. It allows non-contact water to flow from the North-East watershed to Nemo Lake. Its objective is to reduce the amount of contact water reporting to IVR Pit.

The construction of IVR DC was part of the expansion project. It occurred from September to October 2020 and the channel was commissioned during freshet 2021. The channel has a trapezoidal shape with lateral slopes of 2H:1V to 3H:1V, a base width of 3.0 m, and a bed-slope of 0.3%, in combination with a pervious rockfill perimeter berm that is delimiting the west boundary of the channel and also acts as an access road. The IVR DC was constructed with a layer of fine filter material placed on top of the excavated foundation followed by geotextile and overlain by riprap.

### **3.6 Dewatering**

As per the Type A Water Licence 2AM-WTP1830, Agnico Eagle initiated the dewatering of Whale Tail Lake (North Basin) in 2019 following the construction of the Whale Tail and Mammoth dikes and the fish out.

The estimated total volume of Whale Tail Lake (Lake A17) is 8.5 million m<sup>3</sup> (Mm<sup>3</sup>). The dewatering started early March 2019. A total of 2,148,542 m<sup>3</sup> of water was discharged directly to Whale Tail Lake South Basin without requiring treatment. The second phase of dewatering started in mid June 2019 discharging to Lake A16 (Mammoth Lake). For this phase of dewatering, water from the North Basin



was treated via the TSS removal unit of the WTP and discharged in Mammoth Lake through the diffuser.

Once the dewatering phase was completed in Q2 2020, part of the North Basin located outside the Whale Tail Pit footprint became the Whale Tail Attenuation Pond. The Whale Tail Attenuation Pond is since used to receive contact water from different sumps and ponds around site.

Waterbodies and ponds within the footprint of the IVR Pit, IVR WRSF, and IVR Attenuation Pond required dewatering in 2020. To allow the mining of the IVR Pit, lakes A46, A47 and A49 were dewatered in 2020. Following fish out completion, lakes inside the IVR pit mining footprint were dewatered and transferred into the Whale Tail Attenuation Pond representing a total approximate volume of 215,000 m<sup>3</sup>.

A similar process to the one mentioned above was also used to dewater the waterbodies inside the IVR WRSF footprint (AP-21, A50, A51 and A52). The water was discharged into lake A53 once its fish out was completed for a total approximate volume of 38,000 m<sup>3</sup>.

Similar to the Whale Tail (North Basin) dewatering process, approximately 2/3 of the dewatered water from Lake A53 was pumped and directly discharged to Whale Tail Lake (South Basin). The remaining 1/3 of the water was processed through the WTP during open water conditions. The complete dewatering of A53 represents a total approximate volume of 213,000 m<sup>3</sup>. Once Lake A53 dewatering and fishout was completed it became the IVR Attenuation Pond. The IVR Attenuation Pond is intended to receive site contact water from different sumps and ponds around site.

### **3.7 Water Management Activity During Construction and Operations**

An inventory of waterbodies impacted by mining activities is provided in Table 3.2 (Section 3.4) and the water management facilities required for the Plan are provided in Table 3.3 (Section 3.5). These tables should be read in conjunction with Table 3.4, 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 3.10.

Any water requiring treatment will be pumped to the water treatment plant(s) prior to discharge through the diffuser in Mammoth Lake or through the diffuser in Whale Tail Lake (South Basin) or other alternatives. The latter are outlined in the Whale Tail Pit Expansion Project Adaptive Management Plan. The other alternatives for discharge are Lakes D1 and D5 in the case that Level 3 is reached (high risk situation in the receiver water quality). Discharging in Lakes D1 or D5 would require a complete assessment of potential discharge, with approval from the NWB as per NIRB Project Certificate Conditions.

Water collected in the Whale Tail Attenuation Pond and/or IVR 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.

Non-contact water will be diverted away from the mine site infrastructure by reversing natural flows or by using diversion channels and culverts.

Freshwater usage on site will be supplied from Lake C38 (Nemo Lake) and Lake A16 (Mammoth Lake) during operations, and from Whale Tail Lake (South Basin) during closure.

In the amended Water Licence the permitted freshwater sources are Nemo Lake (all purpose), Mammoth Lake (explosive mixing and associated use), Lake D1 (Re-flooding of Whale Tail Pit, IVR Pit, Underground mine, and Whale Tail (North Basin) and associated use, or as otherwise approved by the Board in writing), and Whale Tail South (Re-flooding of Whale Tail Pit, IVR Pit, Underground mine, and Whale Tail (North Basin) and associated use, or as otherwise approved by the Board in writing).

**Table 3.4 Water Management Activities During Construction and Operations**

Mine Year	Water Management Activities and Sequence
Year -1 (2018)	<ul style="list-style-type: none"> <li>Temporarily pump contact water from the Stage 1 WRSF sump to Quarry 1</li> <li>Temporarily pump contact water from the starter pit, construction, ore stockpiles, industrial sector, and main camp sector to Quarry 1</li> <li>Treat turbid water from construction using the construction WTP and discharge in Whale Tail North</li> <li>Pump STP effluent to Whale Tail Lake (North Basin)</li> <li>Freshwater intake initially located in Whale Tail Lake (South Basin); moved to Lake C38 (Nemo Lake)</li> </ul>
Year 1 (2019)	<ul style="list-style-type: none"> <li>Dewatering of Whale Tail Lake (North Basin) to Whale Tail South Basin and Mammoth Lake (through the WTP)</li> <li>Pump contact water from the open pit to Quarry 1</li> <li>Pump contact water from the Whale Tail WRSF Pond to Quarry 1</li> <li>Treat through the WTP the Whale Tail North Water above discharge limit and discharge in Lake A16 (Mammoth Lake)</li> <li>Pump contact water from Quarry 1 to Mammoth Lake (when water quality meets discharge criteria, treat as needed at WTP) (following authorization)</li> <li>Pumping of non-contact water from: <ul style="list-style-type: none"> <li>North-East Pond to the C-watershed</li> <li>North-East Pond to Whale Tail North</li> <li>North-East Pond to AP5 (Licence B)</li> <li>A53 Lake to Whale Tail North</li> <li>Whale Tail South Basin to Mammoth Lake</li> <li>AP5 to the C-watershed (Licence B)</li> <li>Whale Tail North to Whale Tail South in the summer months</li> <li>Whale Tail North to Mammoth</li> <li>Whale Tail North to AP5 (Licence B)</li> </ul> </li> <li>Operation of the Whale Tail Dike seepage collection system by pumping seepage water to Whale Tail South Basin</li> <li>Pump STP effluent to Whale Tail North</li> </ul>

Mine Year	Water Management Activities and Sequence
Year 2-3 (2020-2021)	<ul style="list-style-type: none"> <li>• Completion of dewatering activity. WTN becomes an attenuation pond</li> <li>• Pump contact water from the open pit to the Whale Tail Attenuation Pond (to Quarry 1 until May 2020)</li> <li>• Pump contact water from the Whale Tail WRSF Pond to the Whale Tail or IVR Attenuation Pond (to Quarry 1 until freshet 2020)</li> <li>• Treat through the WTP the Whale Tail and IVR Attenuation Ponds contact water and discharge in Lake A16 (Mammoth Lake) or Whale Tail Lake (South Basin)</li> <li>• Pump contact water from Quarry 1 to Mammoth Lake (if water quality meets discharge criteria) until May 2020</li> <li>• Whale Tail Lake (South Basin) flows to Lake A16 (Mammoth Lake) through the Whale Tail Lake (South Basin) Diversion Channel</li> <li>• Operation of the Whale Tail Dike seepage collection system by pumping seepage water to Whale Tail South when water quality meets discharge criteria</li> <li>• Pump STP effluent to the Whale Tail or IVR Attenuation Ponds</li> <li>• Maintain North-East Pond sector water level by pumping to Whale Tail North Basin (only for 2020)</li> <li>• Construct IVR Diversion and divert non-contact water from the Northeast Sector to Nemo Lake</li> <li>• Dewater waterbodies and ponds inside IVR pit footprint to Whale Tail Attenuation Pond</li> <li>• Dewater waterbodies and ponds inside IVR WRSF footprint to A53</li> <li>• Dewater Lake A53 to Whale Tail Lake (South Basin) and remaining to Whale Tail Attenuation Pond</li> <li>• Pump GSP-1 contact water to Whale Tail or IVR Attenuation Ponds</li> <li>• Pump contact water from the IVR Pit to the IVR Attenuation Pond</li> <li>• Pump contact water from the IVR WRSF Contact Water Collection System to the IVR Attenuation Pond</li> <li>• Pump excess water from underground sump to GSP 1 when Underground Storage Stope is full</li> <li>• Pump contact water from the Whale Tail Pit to the IVR Attenuation Pond</li> <li>• Pump contact water from the Whale Tail Attenuation Pond to the IVR Attenuation Pond</li> <li>• Pumping of non-contact water from Whale Tail South Basin to Mammoth Lake</li> <li>• Capture runoff from Whale Tail WRSF and NPAG WRSF; pump to the IVR Attenuation Pond</li> <li>• Treat the IVR Attenuation Pond contact water through the WTP and discharge in Whale Tail Lake (South Basin) and/or Lake A16 (Mammoth Lake)</li> </ul>
Year 4 to 7 (2022 to 2025)	<ul style="list-style-type: none"> <li>• Pump contact water from the Whale Tail WRSF Pond to the Whale Tail and IVR Attenuation Ponds</li> <li>• Pump contact water from the Pits to the IVR Attenuation Pond or Whale Tail Attenuation Pond</li> <li>• Pump contact water from the IVR WRSF Contact Water Collection System to the IVR Attenuation Pond</li> <li>• Pump STP effluent to the Whale Tail Attenuation Pond or IVR Attenuation Pond</li> <li>• Pump GSP-1 contact water to Whale Tail or IVR Attenuation Ponds.</li> <li>• Capture runoff from Whale Tail WRSF and NPAG WRSF; pump to WRSF Pond, Whale Tail Attenuation Pond or to the IVR Attenuation Pond</li> </ul>

Mine Year	Water Management Activities and Sequence
	<ul style="list-style-type: none"> <li>• Pump contact water from the WRSF Pond to Whale Tail Attenuation Pond or IVR Attenuation Pond</li> <li>• Pump contact water from the Whale Tail Attenuation Pond to the IVR Attenuation Pond</li> <li>• Pump contact water from the IVR Attenuation Pond to the Whale Tail Attenuation Pond</li> <li>• Treat through the WTP the Whale Tail and IVR Attenuation Ponds contact water and discharge in Lake A16 (Mammoth Lake) or Whale Tail Lake (South Basin)</li> <li>• Pump excess water from underground sump to GSP 1 when Underground Storage Stope is full</li> <li>• Construct GSP-2 and GSP-3 if additional capacity for contact water storage is required at surface.</li> <li>• Whale Tail Lake (South Basin) flows to Lake A16 (Mammoth Lake) through the Whale Tail Lake (South Basin) Diversion Channel</li> <li>• Operation of the Whale Tail Dike seepage collection system by pumping seepage water to Whale Tail South when water quality meets discharge criteria</li> <li>• Divert non-contact water from the Northeast Sector to Nemo Lake using IVR Diversion</li> <li>• Pumping of non-contact water from Whale Tail South Basin to Mammoth Lake</li> </ul>

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

Table 3.5 presented below 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 of the non-contact water on site is also presented in Section 3.7.16. 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 (primary)  Whale Tail Attenuation Pond (secondary)
Whale Tail and IVR WRSFs Sector	Whale Tail WRSF Ponds IVR WRSF collection system	
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.

### 3.7.1 Erosion and Sediment Control Plan

As described in the previous sections, 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 for Whale Tail and IVR Pits may include:

- Silt fences and fabric installation
- Turbidity curtains
- Sediment control basins to detain sediment-laden water
- 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
- Construction of swales in ditches

Monitoring of erosion and sedimentation associated with construction and operations are detailed in the Water Quality and Flow Monitoring Plan (Agnico Eagle, 2019b), and dike construction sediment control and monitoring is presented in the Dike Construction and Dewatering Management Plan (Agnico Eagle, 2020).

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

### 3.7.2 Whale Tail Attenuation Pond

The Whale Tail Attenuation Pond is located in a deep part of Whale Tail Lake (North Basin), following the dewatering of the North Basin.

Starting at freshet 2020, the Whale Tail Attenuation Pond is one of the main contact water ponds for the project. Contact water from the Whale Tail WRSF Pond and runoff water in the open pits collected by sumps can be pumped to the Whale Tail Attenuation Pond.

Excess water is transferred to the IVR Attenuation Pond or is treated by the WTP for TSS and arsenic if required prior to discharge to the receiving environment via the diffuser into Lake A16 (Mammoth Lake) or Whale Tail South.

Monitoring of the effluent discharge to Mammoth Lake or Whale Tail South is done as per the Water License requirement and MDMER regulation and is detailed in the Whale Tail Pit Water Quality and Flow Monitoring Plan (Agnico Eagle, 2019b).

### **3.7.3 IVR Attenuation Pond**

The other main contact water pond of the Project (i.e., IVR Attenuation Pond) is located in the former Lake A53, following the A53 dewatering and IVR Dike construction. Contact water from the IVR WRSF collection system, the Whale Tail WRSF Pond, and runoff water in the open pits collected by sump can be pumped to the IVR Attenuation Pond.

Excess water will either be transferred to the Whale Tail Attenuation Pond or be treated by the WTP for TSS and arsenic if required prior to discharge to the receiving environment via the diffuser into Lake A16 (Mammoth Lake) or Whale Tail South.

### **3.7.4 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.

Seepage and runoff from the Whale Tail WRSF during the construction and operational phases is managed via the Whale Tail WRSF Pond, isolated by the Whale Tail WRSF Dike, where the contact water is pumped to the Whale Tail Attenuation Pond or to the IVR Attenuation Pond.

Runoff from the ultimate footprint of the Whale Tail WRSF will report to the Whale Tail WRSF Contact Water Collection System and the IVR Pit.

All overburden soils will be stabilized with waste rock berms to limit spreading and soil water separation. More details about management of the Whale Tail WRSF are presented in the Whale Tail Mine – Waste Rock Management Plan (Agnico Eagle, 2023a).

In April 2019, O’Kane Consultants developed a landform water balance model for the Whale Tail and IVR WRSFs (OKC, 2019). Information on the landform water balance model can be found in the report referenced in the waste management plan (OKC, 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.

### **3.7.5 Water Management in IVR Waste Rock Storage Facility**

The IVR WRSF is in operation since the IVR Pit was initiated. Runoff from the IVR WRSF is sent to the IVR Attenuation Pond. The total catchment of the IVR WRSF increases proportionally with the increase in waste rock footprint.

### **3.7.6 Water Management for Overburden Storage**

The overburden storage is 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. Channels will be constructed if deemed required.

### **3.7.7 Water Management for Ore Stockpile Areas**

The ore stockpiles are located within the catchment of the Whale Tail Attenuation Pond or the IVR Attenuation Pond as shown in Appendix A. Based on the topographic information, contact water will naturally flow to the Whale Tail or IVR Attenuation Ponds for further treatment. If deemed required channels will be constructed and water management systems (i.e., pump, piping, etc.) will be installed to direct runoff to the pond.

The Ore Stockpiles are designed based on the following considerations. A cover of overburden and/or waste rock was placed over original ground to reduce any thaw-induced differential settlements. Waste rock was then placed to follow the natural topography, thereby reducing the likelihood of water ponding on the surface of the pad requiring additional maintenance. Any surface run off from the ore stockpile or the pad will be directed to the Attenuation Pond containment area.

### **3.7.8 Water Management for Quarry 1**

Until freshet 2020, Quarry 1 was used as the main contact water pond for the Whale Tail site. Prior to commissioning of the Whale Tail Attenuation Pond, contact water collected from the Stage 1 WRSF sump, from the starter pit, construction, and industrial sectors was pumped to Quarry 1. The contact water from Quarry 1 was pumped to Mammoth Lake without treatment when the water quality met discharge criteria. The discharge was done via the permanent diffuser in Mammoth Lake. If needed, water was treated via the Water Treatment Plant to meet discharge criteria.

As of 2021 Quarry 1 is part of Whale Tail Pit and is no longer available to be used as a storage area for water management.

### **3.7.9 Water Management for the Whale Tail Open Pit Sector**

The Whale Tail open pit is planned to extend to approximately 300 m below the ground surface. The open pit will be mined mostly within permafrost except for the north-central portion of the pit which will be within the closed talik at the northern end of Lake A17 (Whale Tail Lake). The pit does not extend through the bottom of the closed talik; however, the open pit acts as a sink for groundwater flow during operations, with water induced to flow up through the open talik beneath the central portion of Lake A17 (Whale Tail Lake) and into the open pit. Accordingly, groundwater inflows into the open pit are expected; this water will be mixed with the open pit contact water and pumped to the IVR Attenuation Pond and/or the Whale Tail Attenuation Pond for further treatment.

The overall inflow to the pit is not expected to decrease significantly as the pit deepens because the flow of water is primarily through the permeable weathered bedrock and because the lower portion of the pit is in permafrost. It is important to note that most of the volume is expected to be due to seepage from Whale Tail South and the Whale Tail Attenuation Pond.

Groundwater inflow predictions during operations conservatively assume 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. 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.

### **3.7.10 Water Management for the IVR Open Pit Sector**

The IVR Pit is located north of Whale Tail Lake, within the Northeast Sector in the permafrost environment, thus no groundwater inflows are predicted. Water management infrastructures are designed to only manage runoff water reporting to the pit during freshet. The IVR Pit runoff is conveyed to the active attenuation pond (i.e., IVR Attenuation Pond).

### **3.7.11 Water Management for the IVR and WT Pit Pushbacks**

During operations, the water is managed within the pits as detailed in Sections 3.7.9 and 3.7.10. No additional water management infrastructure is required for this activity. The IVR Pushback may be used as a staging sump prior to being backfilled.

### **3.7.12 Water Management for Haul Roads**

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

The approach to water management for these roads will involve the implementation of local best management practices during the construction, operational, and closure phases. The roads 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.

### **3.7.13 Water Management for Landfill**

The landfill is located southeast of the Whale Tail WRSF, within the catchment of the Whale Tail WRSF Pond, as shown in Appendix A. Based on the topographical information, runoff and any seepage from the landfill will naturally flow to the Whale Tail WRSF Pond and then be 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.

### **3.7.14 Sludge and 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 alternative discharges.

Sludge disposal will be done in the Whale Tail WRSF.

#### **OPERATION WATER TREATMENT PLANT (WTP)**

The arsenic and TSS water treatment plant (WTP) was commissioned at the beginning of May 2019, to treat the final dewatering volumes from Whale Tail Lake (North Basin). This plant is used to treat surface water for TSS and arsenic before discharging to an approved diffuser. The arsenic water treatment unit has not been required so far.

Sludge water from the Operation Water Treatment Plant (OWTP) is dewatered with a centrifuge to produce a cake having a density with 20% of solid content. This cake will be stored in the Whale Tail WRSF. The maximum predicted annual volume of cake from the OWTP is approximately 5,760 cubic metres (m<sup>3</sup>).

#### **TDS WATER TREATMENT PLANT (S-WTP)**

The S-WTP is not needed according to the latest water balance as the current underground mining plan is designed to minimize the inflows requiring TDS treatment by staying in the permafrost. The S-WTP would include a TDS Treatment plant if required.

The concept for the TDS Treatment plant would be to treat low salinity water that is stored in the GSP-2 until closure. The TDS Treatment plant would be active only from June through September. The permeate would be combined with the WTP effluent for discharge from site. The brine produced from

the TDS Treatment plant would be stored in GSP-1. The S-WTP could also include two Desalination units, which would treat water stored in GSP-1. The salt solid produced from treatment would either be used at site and/or shipped off site, and the permeate would be combined with WTP effluent for discharge from site.

Agnico Eagle is currently developing an Underground Project limited into the permafrost only. This change results in no more treatment and discharge of saline water to Whale Tail Lake. The water management strategy for underground water would only be based on storing water in GSP-1 and GSP-2. High and low salinity water would not be segregated anymore.

### **3.7.15 Underground Water Management**

Underground development groundwater and contact water will be managed in dedicated surface infrastructures for contact water. For 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.
- Excess water volumes in the underground mine will be managed through the Underground Mine Stope and GSP-1 and GSP-2. Excess water volumes may also be managed with GSP-3 planned for contingency, operational flexibility, and adaptive management opportunity.
- Water stored in GSP-1 and GSP-2 could be used as a source for dust suppression on surface roads, as input into the cemented rockfill, or used for drilling activity underground.
- At the end of underground mining, any remaining water in the GSP ponds will be pumped underground for flooding of the underground workings.

### **3.7.16 Non-Contact Water Management**

The non-contact water management systems are described below. These systems are required to meet the objective of avoiding mixing contact and non-contact water.

#### Whale Tail Dike Seepage Discharge to Whale Tail South Basin

The non-contact water seeping from Whale Tail Dike (WTD) is collected into the seepage collection system before reaching the Whale Tail Attenuation Pond and then discharged to Whale Tail South Basin. The seepage collection system consists of 4 pumping wells that surface seepage is diverted into and that are deep enough to potentially collect most below surface seepage as well. This system allows to minimize the volume of water reporting to Whale Tail Attenuation Pond. Details of the installation and the system will be compiled in the as-built report, which is in progress and will be completed once the system is fully commissioned.

Seepage water, collected from this system, can be discharged into the Whale Tail South Basin via a diffuser without treatment if the water quality meets the discharge criteria of the Water License 2AM-

WTP1830. If discharge criteria are not met, water will overflow from the pump stations to the Whale Tail Attenuation Pond, and then will be pumped through the WTP for discharge.

Routine monitoring of the seepage water quality from each pump station will be as per the Water Licence 2AM-WTP1830 and the Metal and Diamond Mining Effluent Regulation (MDMER). This monitoring will allow Agnico Eagle to put mitigation measures (for example, treating the water via the WTP) in place if needed. Turbidity and pH will also be monitored.

Since 2020, following the Whale Tail Dike grouting campaign, the seepage pH results indicated an increase above the acceptable limit indicated in the Water License 2AM-WTP1830. The seepage collected from the system was therefore pumped to the Whale Tail Attenuation Pond. Agnico Eagle will continue to closely monitor the situation.

#### IVR Diversion Channel

The IVR Diversion channel is intended to collect non-contact runoff water from the east side of the Nemo watershed and divert it by gravity to Nemo Lake. This infrastructure is 260 m long and allows minimizing the volume of non-contact runoff water reporting to the IVR Pit area. The IVR Diversion Channel construction has been completed in 2020.

#### South Whale Tail Channel (SWTC)

Construction of the South Whale Tail Channel (SWTC) has been completed in 2020 prior to the freshet. The SWTC connects Whale Tail South basin to Mammoth Lake. The 900 m long channel is approximately 5m wide at the base with lateral slopes of 3H:1V. Once excavated, the channel was covered with multiple layers of coarse and fine materials, rip rap, and a layer of geotextiles to ensure minimal TSS in the flow reporting to Mammoth Lake and also preventing erosion. At the outlet of the channel, a turbidity barrier was installed and will remain in place as a supplementary protection to avoid TSS flowing into Mammoth Lake. The channel allows Agnico Eagle to naturally control the Whale Tail South water level without any mechanical transfer intervention. Details of the channel construction can be found in the as-built report (SNC, 2020).

#### **3.7.16.1 Adaptive Management for Non-Contact Water**

In order to adequately manage non-contact water on site, some passive flows have been in the past substituted with a pumping alternative that complies with the original intent of the approved water balance and Water License 2AM-WTP1830 (same origin and destination of water). Those systems were proposed as adaptive management methods, in response to the encountered site conditions during open water season and the high volume of precipitation received, resulting in additional volume of water to manage.

#### North-East Pond to C-watershed

The non-contact water from the North-East (NE) Pond watershed was initially planned to overflow by gravity toward Nemo Lake once the North-East Dike was operational. During a routine inspection in July 2019, it was observed that the topography toward Nemo Lake would not allow water to overflow naturally before overtopping the dike liner. Following this observation, water was pumped from NE Pond toward the project site as per approval from NWB, adding pressure on dewatering activity. The water from the NE Pond was then pumped to the tundra within the Nemo watershed (Watershed C). This system for water level management was operational in 2019 and 2020 prior to the dewatering of the IVR footprint and was used to manage the water level in the NE Pond when required, until NE Dike was dismantled in late 2020.

#### North-East Sector Pond Management

During the summer of 2019 and 2020, significant water inflows from Lake A49 towards the Whale Tail Pit area were noticed. Maintaining the water elevation in Lake A49 throughout freshet was required to avoid the transformation of non-contact water (Lake A49 overflow) to contact water (pit water). The objective of this water transfer was to minimize contact water creation. Water was sent into the North-East Pond. Lakes A47 and A49 were dewatered in 2020 as part of the IVR Pit development.

#### A53 Lake to Whale Tail South

The non-contact water from the A53 watershed was planned to be redirected to Whale Tail South through the East Channel.

Prior to the dewatering phase, the water level in Lake A53 was maintained to the natural level by pumping the exceeded volume to Whale Tail South as per previous approval from NWB. Regular water level monitoring was conducted at this time. The monitoring aligns with the Water License 2AM-WTP1830 requirements, Schedule I Table 2 for ST-WT-7 and as per Part F Item 7 for TSS limits.

Once the dewatering phase completed, as explained in Section 3.6 of this report, A53 became the IVR Attenuation Pond.

#### Whale Tail South Discharge to Mammoth Lake

The non-contact water from Whale Tail South Basin was pumped to Mammoth Lake in 2019 as per approval from NWB. This pumping activity was required to manage and then maintain the water level in Whale Tail South Basin, in order to allow for the construction of the Whale Tail South Channel (SWTC) and preserve the integrity of Whale Tail Dike. This system temporarily substituted passive flow via the SWTC with a pumping alternative that complies with the original intent of the approved water balance and Water License 2AM-WTP1830 (same origin and destination of water). This pumping activity also provided flexibility and added robustness to the water management strategy. Discharge was completed via a diffuser to avoid erosion into Mammoth Lake. Since 2020, no mechanical transfer

from Whale Tail South to Mammoth Lake occurred but Agnico might re-use this system in the future to appropriately manage water on site.

### 3.8 Freshwater Management

The permitted freshwater sources as per the Water License 2AM-WTP1830 are Nemo Lake (all purpose), Mammoth Lake (explosive mixing and associated use), Lake D1 (Re-flooding of Whale Tail Pit, IVR Pit, Underground mine, and Whale Tail (North Basin) and associated use, or as otherwise approved by the Board in writing), and Whale Tail South (Re-flooding of Whale Tail Pit, IVR Pit, Underground mine, and Whale Tail (North Basin) and associated use, or as otherwise approved by the Board in writing).

Freshwater usage includes potable use, fire suppression, dust suppression, drilling water (if contact water is not available), water for the emulsion plant (trucked from the Nemo Lake pumping station), 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 could also be pumped from Lake A16 (Mammoth Lake), as per Part E, condition 1 of the Water License 2AM-WTP1830. Agnico Eagle will endeavour to minimize the amount of freshwater required for the Project, where possible. Table 3.6 summarizes the authorized water use for domestic and industrial purposes during construction and operation.

**Table 3.6 Water Use Authorized for Domestic and Industrial Purposes During Construction and Operation**

Source	Volume (m <sup>3</sup> /year)	Purpose
Nemo Lake	209,544	Domestic camp use, drilling dust suppression, Construction, and Operations and associated use or as otherwise approved by Board in writing
Mammoth Lake	2,500	Explosive mixing and associated use
Whale Tail Lake (North Basin), Lakes A-P38, A-46, A47, A49, A50, A51, A52, A53, A-P21, A-P10, A-P67 and A-P68	153,735	Dewatering
Source Proximal to drilling sites	109,135	Drillings
Source proximal to the Whale Tail Haul Road	109,135	Dust Suppression
<b>Annual Subtotal</b>	<b>584,049</b>	Above-described sources
<b>Annual Contingency (20 %)</b>	<b>116,810</b>	Above-described sources
<b>Annual Total</b>	<b>700,859</b>	

Freshwater is primarily sourced through a freshwater intake and pump system. The intake consists of vertical filtration wells fitted with vertical turbine pumps that supply water on demand. The intake is connected to the pump house with piping buried under a rockfill causeway. The intake pipe exits at the bottom of the causeway and is fitted with a stainless-steel screen, as per Part E, condition 4 of the Water License 2AM-WTP1830. The rockfill causeway acts as a secondary screen to prevent fish from becoming entrained.

The stainless-steel screens design for the water intake is consistent with 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 (South Basin) at closure.

Freshwater is pumped to an insulated main storage tank located at the Whale Tail Camp. The freshwater pipeline is made of a high-density polyethylene pipe and insulated and heat traced. The Whale Tail Camp has a Freshwater Treatment Plant (potable). In the Potable WTP, the freshwater first goes through sand filters and then is pumped through ultraviolet units, and finally treated with chlorine. The treated water is stored within a potable water tank. Potable water is monitored according to the Nunavut health regulations for total and residual chlorine and microbiological parameters. Treated potable water is piped to other facilities requiring potable water. Detailed plant operation specifications were provided in FEIS Volume 1, Section 1. 2.4.1.

Freshwater and potable water use is required during operations and additional freshwater will be required from Whale Tail Lake at closure. The current Type A Water Licence Part E Item 1 and 2 provides for a maximum quantity of water use not to be exceeded at 700,859 m<sup>3</sup> annually during construction and operation as well as 14,855,606 m<sup>3</sup> annually during closure. The freshwater usage from Nemo Lake needs to respect the license limit of 209,544 m<sup>3</sup> per year.

It is important to note that total annual withdrawals of water from Nemo Lake (209,554 m<sup>3</sup>/year) will remain well below the lake’s annual inflow volume of approximately 476,000 m<sup>3</sup> (based on the mean annual water balance of the lake under baseline conditions), and DFO’s guideline of 10% of the under ice volume for the duration of operations (i.e., under-ice volume of 6,170,000 m<sup>3</sup> derived from FEIS Addendum Appendix 6-M submitted with the Whale Tail Pit - Expansion Project). Residual effects to fish and fish habitat are therefore expected to be negligible.

Following the end of operations, site contact water including contact water in the underground mine watershed (GSP ponds) will be pumped into the underground mine; the remaining voids will be filled with Whale Tail Lake (South Basin) water. 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). Contact water in the underground mine watershed

(GSP ponds) will not be used for this purpose because of their anticipated higher salinity. This water will be used only to flood underground workings. It is anticipated that approximately 75,000,000 m<sup>3</sup> over 18 years from Whale Tail Lake is required to fill the mined-out Whale Tail Pit (i.e., approximately 57,000,000 m<sup>3</sup>), IVR Pit (i.e., approximately 11,000,000 m<sup>3</sup>), underground mine (i.e., approximately 1,000,000 m<sup>3</sup>) and Whale Tail Lake (North Basin) (i.e., approximately 6,000,000 m<sup>3</sup>), including approximately 2,900,000 m<sup>3</sup>/year from Whale Tail Lake (South Basin).

As per part E, condition 2 of the Water License 2AM-WTP1830, the use of water from Whale Tail Lake shall not exceed a total of 10,655,000 m<sup>3</sup>/year commencing when notification of closure is received by the NWB through to the expiry of the Licence. The limit for Nemo Lake is 14,672 m<sup>3</sup>/year and the limit for Lake D1 is 1,710,000 m<sup>3</sup>/year, both commencing when notification of closure is received by the NWB through to the expiry of the Licence.

### 3.9 Sewage Water Management

Sewage is collected from the camp and change-room facilities and pumped to a sewage treatment plant (STP). The objective of the STP is to treat sewage to an acceptable level for discharge to the Whale Tail or IVR Attenuation Ponds via a sewage water discharge pipeline. The STP is housed in a prefabricated (modular) structure located in the Whale Tail Camp. The sewage treatment system is designed based on the occupation maximum of the camp for 400 persons (240L per day and per person). The design average daily flow is 96 m<sup>3</sup>/day (4 cubic metres per hour [m<sup>3</sup>/hour]).

Previously, the sewage treatment plant at the Amaruq camp could accommodate 400 workers. With the addition of four wings to the Operations Camp for the project expansion, the total camp capacity was increased to 546 workers. An expansion of the sewage treatment systems was thus required. These systems are built with typical 40-foot containers.

No major change in operation or water quality happened as a result of this expansion. The upgraded sewage treatment system is designed based on a flow rate of 240 L per day per room for 546 people, for an average daily flow rate of 131 m<sup>3</sup>/day (5.42 cubic metres per hour [m<sup>3</sup>/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 is 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 3.7 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 (Agnico Eagle, 2019a). 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 3.7 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 <sub>3</sub>	-	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
• NO <sub>3</sub> -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 blended between kitchen and dormitory wastewater after the grease trap.
2. A complete list of prohibited chemicals is included in the membrane maintenance manual.

### 3.10 Water Management During Closure

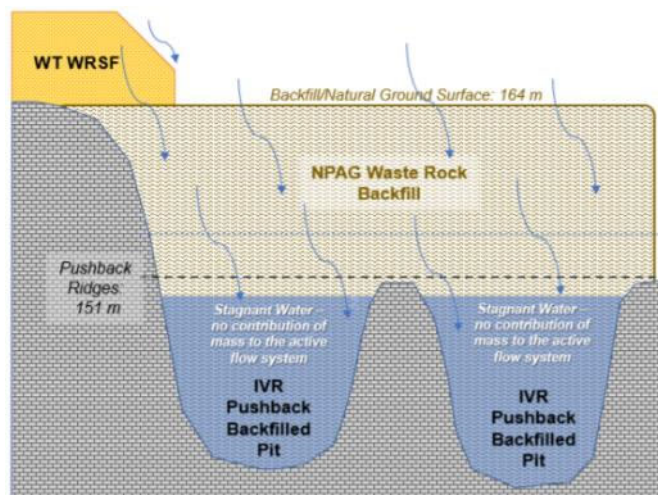
Mine closure is integral to the mine design and will be modified during operations. Planning for permanent closure is an active and iterative process. The intent of the process is to develop a final closure plan including specific water management components using adaptive management. This begins during 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 mine closure and reclamation activities are provided in the Whale Tail Pit Interim Closure and Reclamation Plan and will be detailed in the Final Closure and Reclamation Plan.



Water management during closure and reclamation will involve actively filling the underground facilities, Whale Tail Pit, 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.

The pushback in the IVR pit will be filled with NPAG-NML waste rock and be naturally refilled by water inflows as described above. Figure 3.4 shows the conceptual approach to water flow in the upper portion of the pit which would eventually flow into Whale Tail Pit.

**Figure 3.4 Conceptual Representation of Water Flow in IVR Pushback During Closure**



Water management during closure and reclamation will involve maintaining contact water management systems on site until monitoring results demonstrate that water quality is acceptable for discharge of all contact water to the environment without further treatment. Once 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 the WRSF seepage outlet post-closure and to evaluate seasonal water circulation patterns in Mammoth Lake resulting from effluent discharge. This analysis also aimed 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 is 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 the East Sector needs to be re-established 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 directed to the Whale Tail Pit. The IVR Pit walls are composed primarily of south komatiite and basalt with some north greywacke rock. Based on these predictions, a control mechanism will be required 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 WRSFs 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 quality 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 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 3.8. Appendix B shows the water management flowsheets during mine closure phases.

**Table 3.8 Key Water Management Activities During Mine Closure**

Mine Year	Key Water Management Activities and Sequence
Year 8 (2026)	<ul style="list-style-type: none"> <li>• Dewater the Groundwater Storage Ponds and the IVR Attenuation Pond to the underground mine</li> <li>• Backfill the Groundwater Storage Ponds and the IVR Attenuation Pond with NPAG/NML waste rock</li> <li>• 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.</li> <li>• Water from Whale Tail Lake (South Basin) ceases flow through Whale Tail Lake Diversion Channel and to Lake A16 (Mammoth Lake)</li> <li>• Decommission of IVR Diversion to re-establish baseline drainage patterns of the Northeast Sector catchment towards the IVR Pit</li> <li>• Pump WRSF Pond water to the IVR Pit</li> <li>• Pump Whale Tail Lake (South Basin) to the IVR Pit during summer months to maintain its elevation at 153.5 masl</li> <li>• Re-establish baseline drainage patterns of East Sector runoff towards the Whale Tail Attenuation Pond, including runoff over the backfilled IVR Attenuation Pond</li> <li>• The Whale Tail Attenuation Pond overflows (once full) into the Whale Tail Pit</li> <li>• Passively direct runoff from the IVR WRSF and the backfilled Groundwater Storage Ponds to the Whale Tail Pit</li> <li>• Start of site water quality monitoring of flooding open pit reservoirs</li> </ul>
Year 9 to Year 25 (2027 to 2043)	<ul style="list-style-type: none"> <li>• 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</li> <li>• The IVR Pit reaches the spill elevation to the Whale Tail Pit and begins overflowing to the Whale Tail Pit</li> <li>• 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.</li> </ul>
Year 26 (2044)	<ul style="list-style-type: none"> <li>• The Whale Tail Pit reaches the spill elevation that connects it with the Whale Tail Attenuation Pond and both water bodies fill simultaneously</li> <li>• 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, including the pushbacks, fill simultaneously to 153.5 masl, forming Whale Tail Lake (North Basin)</li> <li>• 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 ongoing 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</li> <li>• Once Whale Tail Lake (North Basin) is flooded to 153.5 masl, remove STP</li> <li>• 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)</li> <li>• 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)</li> </ul>

Mine Year	Key Water Management Activities and Sequence
	<ul style="list-style-type: none"> <li>Decommission the Whale Tail Dike, water quality permitting</li> <li>Remove site infrastructure</li> </ul>
Post-Closure (2045+) (triggered when water quality in all three water bodies meets the appropriate water quality criteria)	<ul style="list-style-type: none"> <li>Monitoring</li> </ul>

WRSF = Waste Rock Storage Facility

### 3.10.1 Flooding Sequence

The flooding sequence will be adapted to meet water quality closure objectives to allow for the reconnection of the lakes. The water balance and water quality forecast will be updated to optimize the flooding sequence.

Following completion of operations, site contact water including contact water in the underground mine watershed (GSP ponds) will be pumped into the underground mine; the remaining voids will be filled with Whale Tail Lake (South Basin) water. 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).

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-WTP1830. 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-WTP1830, following the Whale Tail Interim Closure and Reclamation Plan.

It is anticipated that approximately 75,000,000 m<sup>3</sup> over 18 years from Whale Tail Lake is required to fill the mined-out Whale Tail Pit (i.e., approximately 57,000,000 m<sup>3</sup>), IVR Pit (i.e., approximately 11,000,000 m<sup>3</sup>), underground mine (i.e., approximately 1,000,000 m<sup>3</sup>) and Whale Tail Lake (North Basin) (i.e., approximately 6,000,000 m<sup>3</sup>), including approximately 2,900,000 m<sup>3</sup>/year from Whale Tail Lake (South Basin). Pumping will be required during non winter months to fill the Whale Tail Lake (North Basin) by 2044.

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 water will then be diverted to the Whale Tail North Basin for

filling. The elevation of the Mammoth sill will be 153.5 masl. The Diversion Channel inlet is at the elevation 155.3 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) is 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) is expected in 2041. Flooding of the IVR West Pushback is expected in 2042 (151.0 masl).

### **3.10.2 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 predicted 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 Closure water quality objectives.

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. Lower volumes and chemical loading of water originating from either of the WRSFs would improve water quality throughout closure in the Whale Tail and IVR Pits, and in Mammoth Lake in post-closure.

Dike decommissioning will involve the removal (breach) of a portion of the dikes 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 to allow for the deployment of turbidity curtains to control potential releases of sediment.

For water collection and management systems closure 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.

### 3.10.3 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, the Whale Tail Dike, Mammoth Dike, and the Whale Tail WRSF Dike will be decommissioned. Whale Tail Lake (North Basin) and Whale Tail Lake (South Basin) form Whale Tail Lake with a water surface area of 2.34 km<sup>2</sup>, 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.

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 are predicted to meet SSWQO as described in FEIS Appendix 6H (Agnico Eagle, 2016).

Mammoth Lake is sensitive to cover material seepage quality, which is in turn sensitive to cover composition and WRSF pile contact water volume. Observational data at the Meadowbank WRSF suggests 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<sup>3</sup> 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-WTP1830 Part E, conditions 5 and 6, Agnico Eagle completes a site wide water balance and pit water quality model update for the Whale Tail Pit Site as part of the annual water management plan.

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**SECTION 4 • WATER QUALITY FORECAST**

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Water quality forecast reports will be revisited on an annual basis until mine closure, as per the Water License part E item 6. The purposes of the report are to identify, through a mass balance approach, the contaminants of concern during the pit flooding process and WRSF contact water mixing into Mammoth Lake post-closure and determine if water treatment will be required on site for closure activities when comparing the final contaminant levels to the CCME guidelines and/or site-specific criteria for parameters that are not included in the CCME Guidelines.

For the 2023 water quality forecast SNC (SNC 2023) completed a water quality forecast for 2023 through operations, closure, and through post-closure.

In the 2023 water quality forecast report (SNC 2023), SNC presents that the water quality forecast (WQF) model estimated conservatively the concentrations for Constituents of Concern (COCs) during operation, closure and post-closure when compared to the values presented in the FEIS assessment and last year's annual report. The WQF model also forecast similar concentration trends over time for the COCs when comparing to FEIS assessment values. Forecasted concentrations are generally higher or in the same range as the measured values on site.

All forecasted concentrations are below the Water Licence criteria and CCME guidelines for the COCs during operation in WT and IVR Attenuation Ponds, except for Total Arsenic. The water from these ponds are treated at the Water Treatment Plant (WTP) prior to discharge to Mammoth or WTS Lakes. In 2022, the treated water met on average the Water Licence discharge criteria for Arsenic. At closure, all of the concentrations of COCs in Mammoth Lake are forecasted to decrease over time since there is no longer any discharge of treated water to the lake. At post-closure, many COCs are forecasted to increase in Mammoth Lake since WTN Basin shall be reconnected to Mammoth Lake once the WT and Mammoth Dikes are breached. However, all COCs are expected to remain below the CCME guidelines, except for Total Phosphorus, Total Chromium and Total Iron.

The following recommendations were proposed to help improve the accuracy of the modelling in the future:

- Continue to monitor water quality in the Attenuation Ponds and Mammoth and WTS Lakes with a specific focus on the following contaminants: As, P, F, Cr, Se, Mn, Fe
- Continue to monitor the water quality collected from the Whale Tail and IVR open pits.
- To better understand the loading of potential COCs from the exposed pit wall during operation and following closure, determine if it is possible to sample the pit wall runoff safely. Consider advancing the hydrogeological model and understanding of the pit wall lithology to assess the potential loading of COCs during operation and closure.
- A robust water quality sampling plan shall need to be developed for closure and post-closure. Areas to sample include WT Pit, IVR Pit, WT Attenuation Pond and the WTN Basin once all of

these ponds are hydraulically connected. Once the WTN Basin is formed, it is recommended to sample the surface water in different areas in the basin as well as different depths to gain a better understanding on the hydraulic behavior of this basin.



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**SECTION 5 • ADAPTIVE MANAGEMENT**

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Adaptive management will be achieved through performance monitoring and management actions that will be implemented, should they be triggered. Action level responses taken during the year will be documented in Agnico Eagle's annual report submitted to the NWB. The Whale Tail Pit Expansion Project – Adaptive Management Plan (Agnico Eagle, 2021c) includes the specific adaptive management strategies related to water management. Three indicators relative to water management are tracked as part of the Adaptive Management Plan: water quality for Whale Tail Project waterbodies, water quantity for surface water management, and water quantity for underground water management.

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**SECTION 6 • REFERENCES**

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- Agnico Eagle (Agnico Eagle Mines Limited). 2023a. Whale Tail Mine – Waste Rock Management Plan, version 10, Meadowbank Division, March 2023.
- Agnico Eagle (Agnico Eagle Mines Limited). 2023b. Water Management Report and Plan, version 11, Meadowbank Division, March 2023.
- Agnico Eagle (Agnico Eagle Mines Limited). 2022a. OMS Manual – Whale Tail Water Management Infrastructures, Version 3, December 2022.
- Agnico Eagle (Agnico Eagle Mines Limited). 2022b. Dewatering Dikes, Operation, Maintenance and Surveillance Manual, Meadowbank Division, December 2022.
- Agnico Eagle, 2021c. Whale Tail Pit Expansion Project – Adaptive Management Plan Version 1.5. Meadowbank Division, July 2021.
- Agnico Eagle, 2020. Dike Construction and Dewatering Management Plan, Meadowbank Division, 2020.
- Agnico Eagle (Agnico Eagle Mines Limited). 2019a. Whale Tail Sewage Treatment Plant Operation and Maintenance Manual, February 2019.
- Agnico Eagle (Agnico Eagle Mines Limited). 2019b. Water Quality and Flow Monitoring Plan, 2019.
- Agnico Eagle (Agnico Eagle Mines Limited). 2018a. Erosion Management Plan, Version 2\_NIRB, Meadowbank Division, September 2018.
- Agnico Eagle (Agnico Eagle Mines Limited). 2018b. Amaruq Stage 1 WRSF, Ore Stockpile 1 and Starter Pit Design Report and Drawings. Meadowbank Division, June 2018.
- Agnico Eagle (Agnico Eagle Mines Limited). 2018c. Whale Tail North Basin dewatering, 60-Day Notice to Nunavut Water Board. Version 1, September 2019.
- Agnico Eagle (Agnico Eagle Mines Limited). 2016. Final Environment Impact Statement (FEIS) Volumes 1 to 8, Whale Tail Pit Project, Meadowbank Division.
- Agnico Eagle (Agnico Eagle Mines Limited). 2015. Water Management Report and Plan, version 3, Meadowbank Division, October 2015.
- CCME (Canadian Council of Ministers of the Environment). 1999 (with updates to 2016). Canadian Environmental Quality Guidelines, 1999. Canadian Environmental Quality Guidelines Summary Table, with updates to 2016. Winnipeg, MB, Canada. Available at: <http://st-ts.ccme.ca/>. Accessed March 2016.

- CCME. 2004. Canadian Water Quality Guidelines for the Protection of Aquatic Life: Phosphorus: Canadian Guidance Framework for the Management of Freshwater Systems. In: Canadian Environmental Quality Guidelines, 2004. Canadian Council of Ministers of the Environment, Winnipeg, MB, Canada.
- CDA (Canadian Dam Association). 2014. Canadian Dam Association, Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams.
- DFO (Fisheries and Oceans Canada). 1995. Freshwater Intake End-of-Pipe Fish Screen Guideline, March 1995.
- Golder (Golder Associates Ltd). 2022. Whale Tail Project 2021 Annual Report – Closure and Post-Closure Water Quality Predictions (Reference 21508120-552-RPT-Rev0). Dated March 2022.
- Golder (Golder Associates Ltd). 2021. Whale Tail Project IVR and Whale Tail Pit Pushback (Reference 21459323-521-RPT-Rev0). Dated June 2021.
- Golder (Golder Associates Ltd.). 2019a. Interim Closure and Reclamation Plan, Agnico Eagle Whale Tail. Dated May 2019.
- Golder (Golder Associates Ltd). 2019b. Whale Tail Lake Thermal Assessment. Dated April 2019 (Reference 18108905-276-RPT-Rev0).
- Golder (Golder Associates Ltd). 2019c. Whale Tail Pit – Expansion Project 2019 Mine Site and Downstream Receiving Water Quality Predictions Update. Dated May 2019.
- Golder (Golder Associates Ltd). 2019d. Whale Tail Pit – Expansion Project 2019 Mean Annual Water Balance Update. Dated May 2019 (Reference 18108905-294-RPT-Rev1).
- Golder (Golder Associates Ltd). 2019e. Updated Hydrogeological Assessment, Whale Tail Pit, Expansion Project. May 2019 (Reference 8108905-291-TM-Rev0)
- Golder (Golder Associates Ltd). 2017a. Whale Tail Lake Thermal Assessment, Whale Tail Pit Project, Nunavut dated 22 February 2017.
- Golder (Golder Associates Ltd). 2017b. Hydrogeological and Permafrost Field Investigations, Amaruq Project 2017 Factual Report. Dated 31 July 2017. (Reference 1649355-008-R-Rev0-5000).
- Government of Canada. 2015. Historical Climate Data. Available online from: [http://climate.weather.gc.ca/index\\_e.html](http://climate.weather.gc.ca/index_e.html)
- Health Canada. 2014. Guidelines for Canadian Drinking Water. Prepared by the Federal-Provincial-Territorial Committee on Drinking Water. Ottawa, ON, Canada.

- ICOLD (International Commission of Large Dams) 1998. Dam Failures and Statistical Analysis. Bulletin 99.
- IPCC. 2014. Summary for Policymakers. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1-32
- Knight Piesold. 2015. Agnico Eagle Mines Ltd.: Meadowbank Division – Whale Tail Pit – Permafrost and Hydrogeological Characterization, File No.: NB101-00622/04-A.01
- McDougall, M., G. Tomy, J. Stetefeld. 2019. 2019 Mammoth Lake Sediment Sampling Report
- NWT Water Board. 1992. Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories.
- Overland, J.E., M. Wang, J.E. Walsh, and J.C. Stroeve. 2013. Future Arctic climate changes: Adaptation and mitigation time scales, *Earth's Future*, 2, doi:10.1002/2013EF000162.
- PhotoSat Information Ltd. (PhotoSat). 2015. PhotoSat Stereo Satellite Elevation Mapping Project Report. Reference No. 3631.
- SNC (SNC Lavalin Inc.). 2023. Water Quality Forecast Update Based on 2022 WMP for Whale Tail Mine. Technical note no. 694013-1000-40ER-0001, rev. 00, March 2023.
- SNC (SNC Lavalin Inc.). 2022. Water Quality Review and Forecast during Operation at Whale Tail Site. Technical note no. 688368-1000-40ER-0001, rev. 00, March 2022.
- SNC (SNC Lavalin Inc.). 2020. Construction Report of South Whale Tail Diversion Channel. Technical note no. 667648-3000-40ER-0001, August 2020.
- SNC (SNC Lavalin Inc.). 2018a. Whale Tail Dike Detailed Design Report.
- SNC (SNC Lavalin Inc.). 2018b. Design criteria – Basins and Pumps. Technical note no. 651298-8000-40EC-0001\_00, April 2018.
- SNC (SNC Lavalin Inc.). 2018c. Amaruq Freeboard Study. Technical note no. 651298-2600-4HER-0002\_01, June 2018.
- SNC (SNC Lavalin Inc.). 2017. Preliminary design of Mammoth Dike. Technical note no. 645003-3000-4GER-0001\_01, August 2017.

SNC (SNC Lavalin Inc.). 2015. Whale Tail Pit Project Permitting Level Engineering, Geotechnical and Water Management Infrastructure, A Technical Report Submitted to Agnico Eagle Mines Ltd. by SNC Lavalin, December 2015.

**APPENDIX A • SITE LAYOUT PLANS**

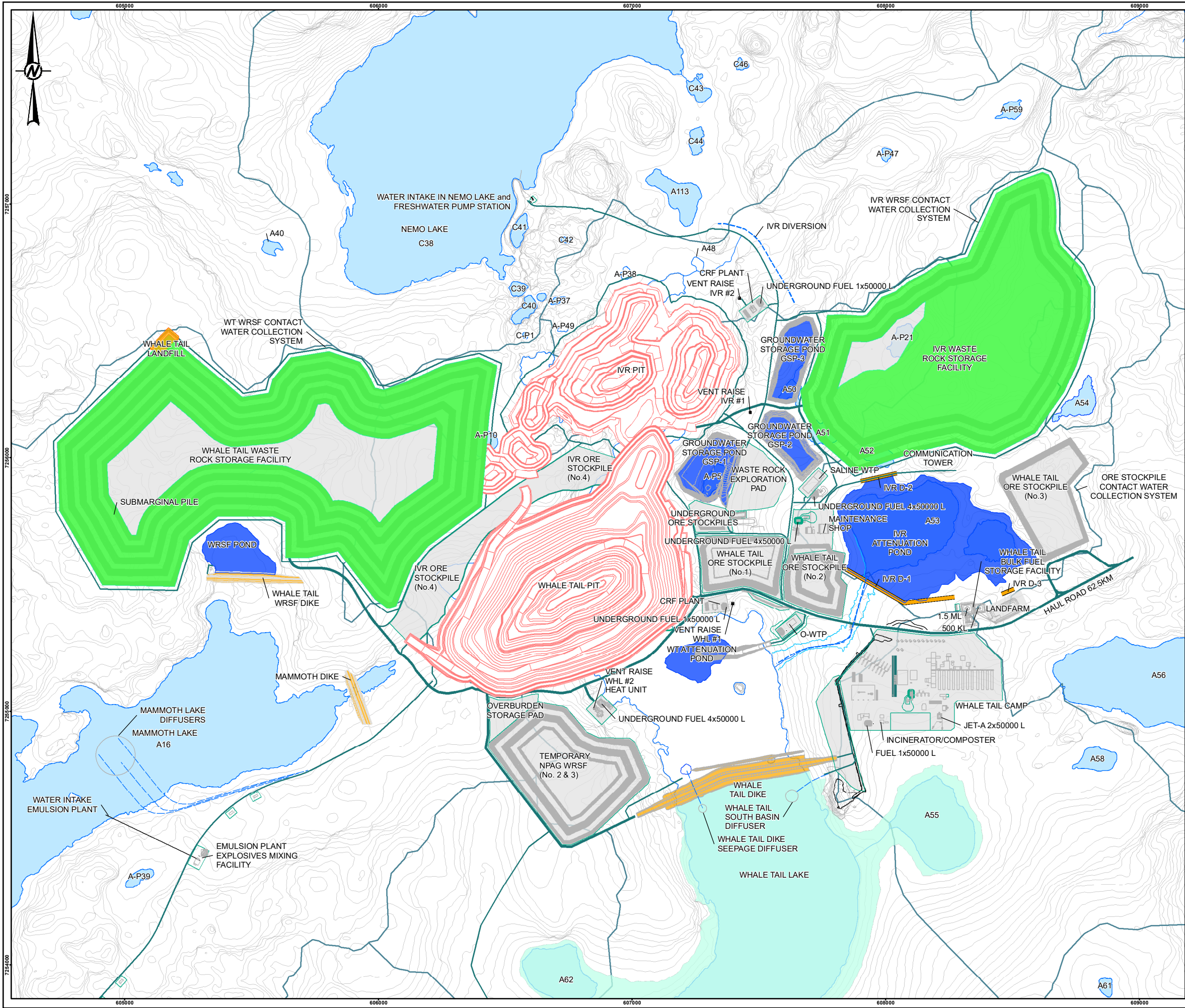
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**Figure A.1      Site Layout Plan (Closure Year 2026)**

**Figure A.2      Site Layout Plan (Post-Closure Year 2045+)**



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**LEGEND**

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


**DRAFT**

0 300 600  
1:15,000 METRES

**NOTE(S)**  
1. IVR PIT PUSHBACK BACKFILLED PRIOR TO WRSF CONSTRUCTION.

**REFERENCE(S)**  
1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED FROM AMQ\_2025Q4V7.DWG  
2. WATERCOURSE AND WATERBODY DATA OBTAINED FROM PHOTOSAT

DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 14

CLIENT  **AGNICO EAGLE MINES LIMITED:**  
MEADOWBANK DIVISION


**AGNICO EAGLE**

PROJECT  
**WHALE TAIL PIT - EXPANSION PROJECT**

TITLE  
**GENERAL ARRANGEMENT PLAN AT END OF PROJECT OPERATIONS**

CONSULTANT	YYYY-MM-DD	2021-06-09
DESIGNED	EP	
PREPARED	CDB	
REVIEWED		
APPROVED		

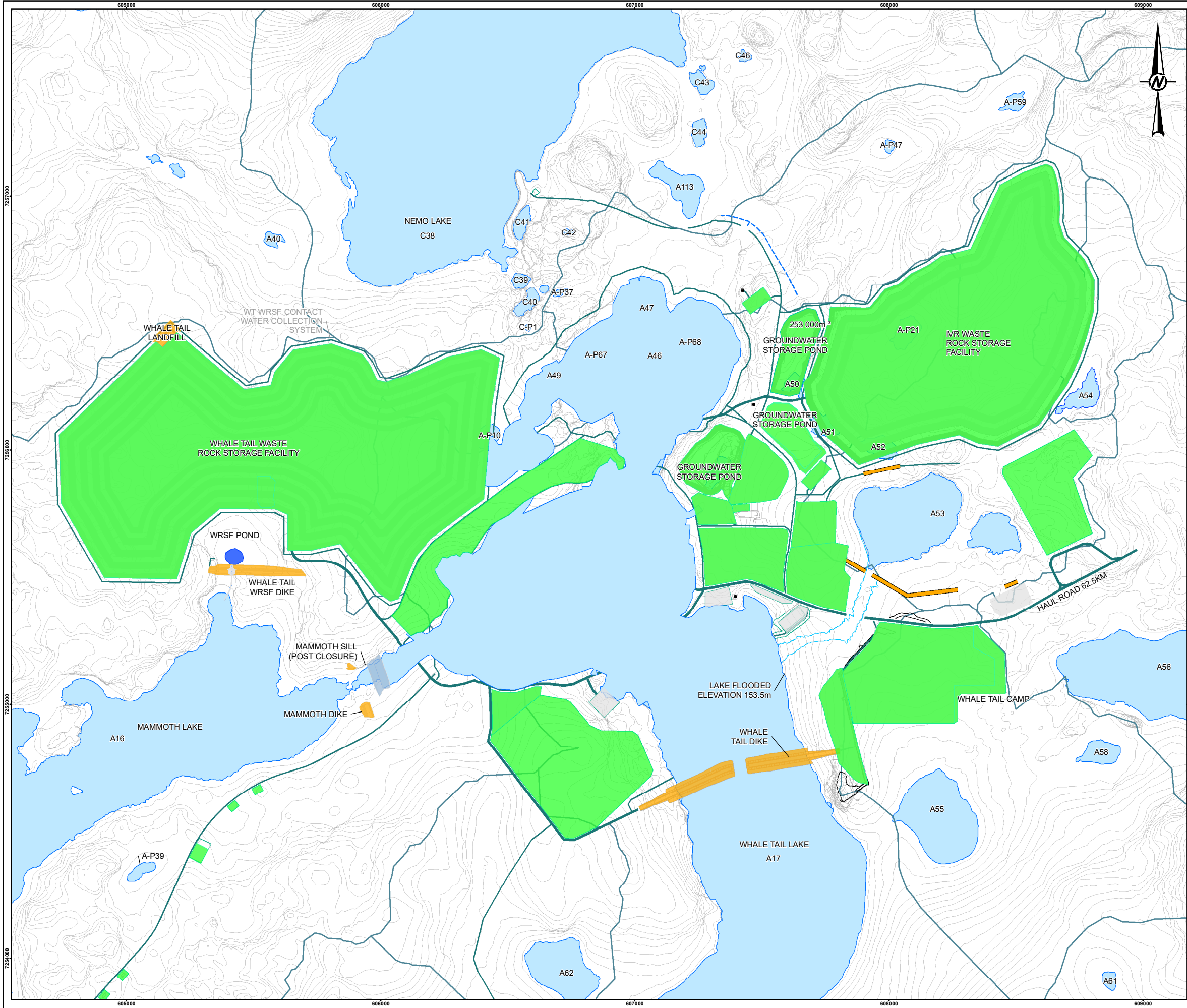
PROJECT NO.	CONTROL	REV.	FIGURE
20136436	2000/2020	A	1

 **GOLDER**  
MEMBER OF WSP

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B  
28mm



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**LEGEND**

- CLOSED FACILITY
- WHALE TAIL LAKE (SOUTH BASIN)
- FLOODED LIMIT (WATER LEVEL 156.0m)
- NATURAL WATERSHED
- DIKE
- POND/SUMP
- ROAD
- WATERCOURSE

**NOTE(S)**

1. IVR PIT PUSHBACK BACKFILLED PRIOR TO WRSF CONSTRUCTION.

**REFERENCE(S)**

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED FROM AMQ\_2029\_AFTER\_MINE.V7.DWG  
2. WATERCOURSE AND WATERBODY DATA OBTAINED FROM PHOTOSAT

DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 14

CLIENT

AGNICO EAGLE MINES LIMITED:  
MEADOWBANK DIVISION

**AGNICO EAGLE**

PROJECT

WHALE TAIL PIT - EXPANSION PROJECT

TITLE

POST-CLOSURE GENERAL ARRANGEMENT PLAN

CONSULTANT	YYYY-MM-DD	2021-06-09
	DESIGNED	EP
	PREPARED	CDB
	REVIEWED	
	APPROVED	

**GOLDER**  
MEMBER OF WSP

PROJECT NO.

20136436

CONTROL

2000/2020

REV.

A

FIGURE

2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

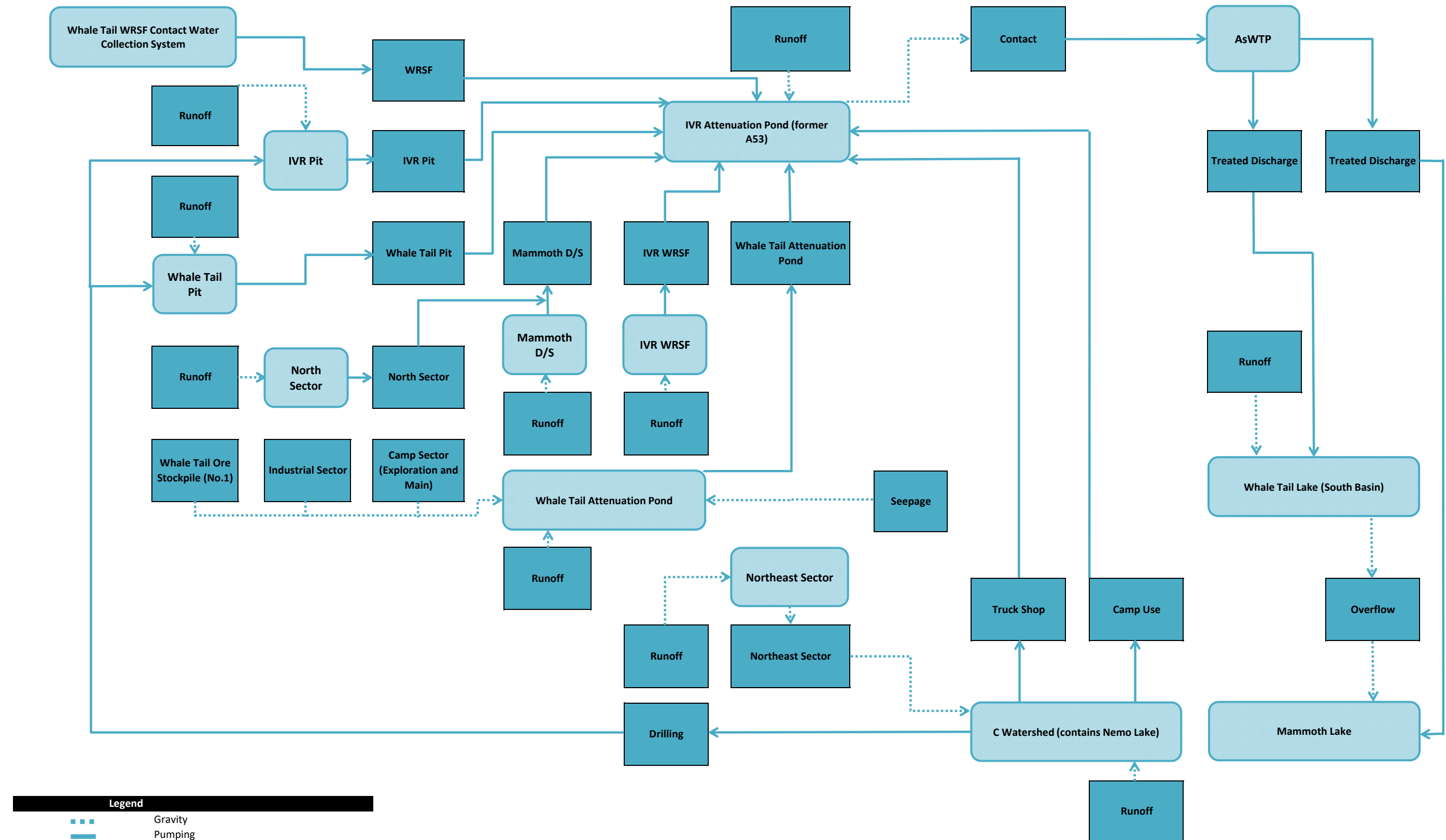
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**APPENDIX B • WATER MANAGEMENT SCHEMATIC FLOW SHEETS**

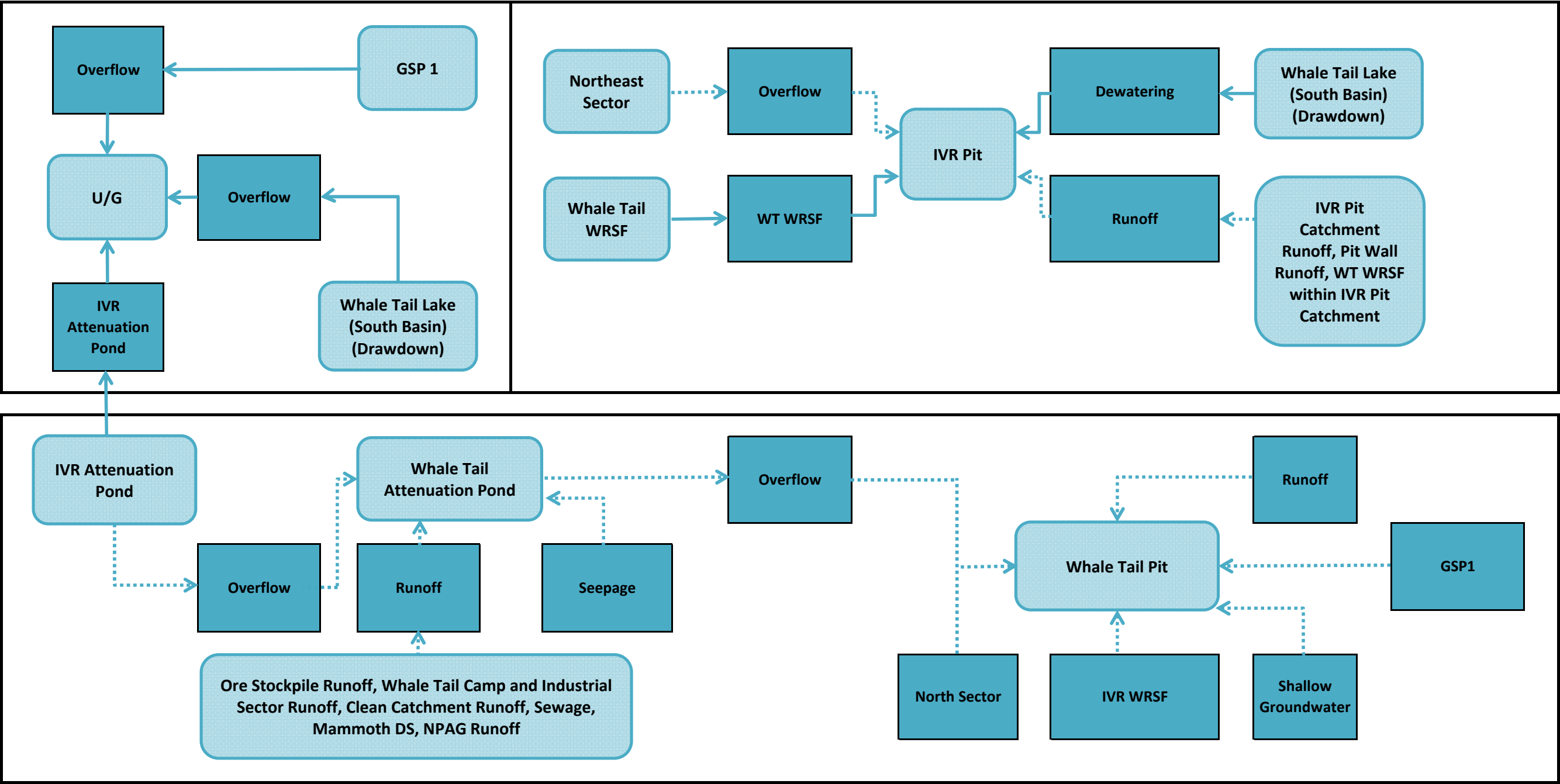
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### General Water Movement - 2022 to 2025



\*Small water transfers are not shown on this drawing, refer to water balance tables for detailed water movement.

General Water Movement - Closure (Active Flooding): Underground Mine



Legend

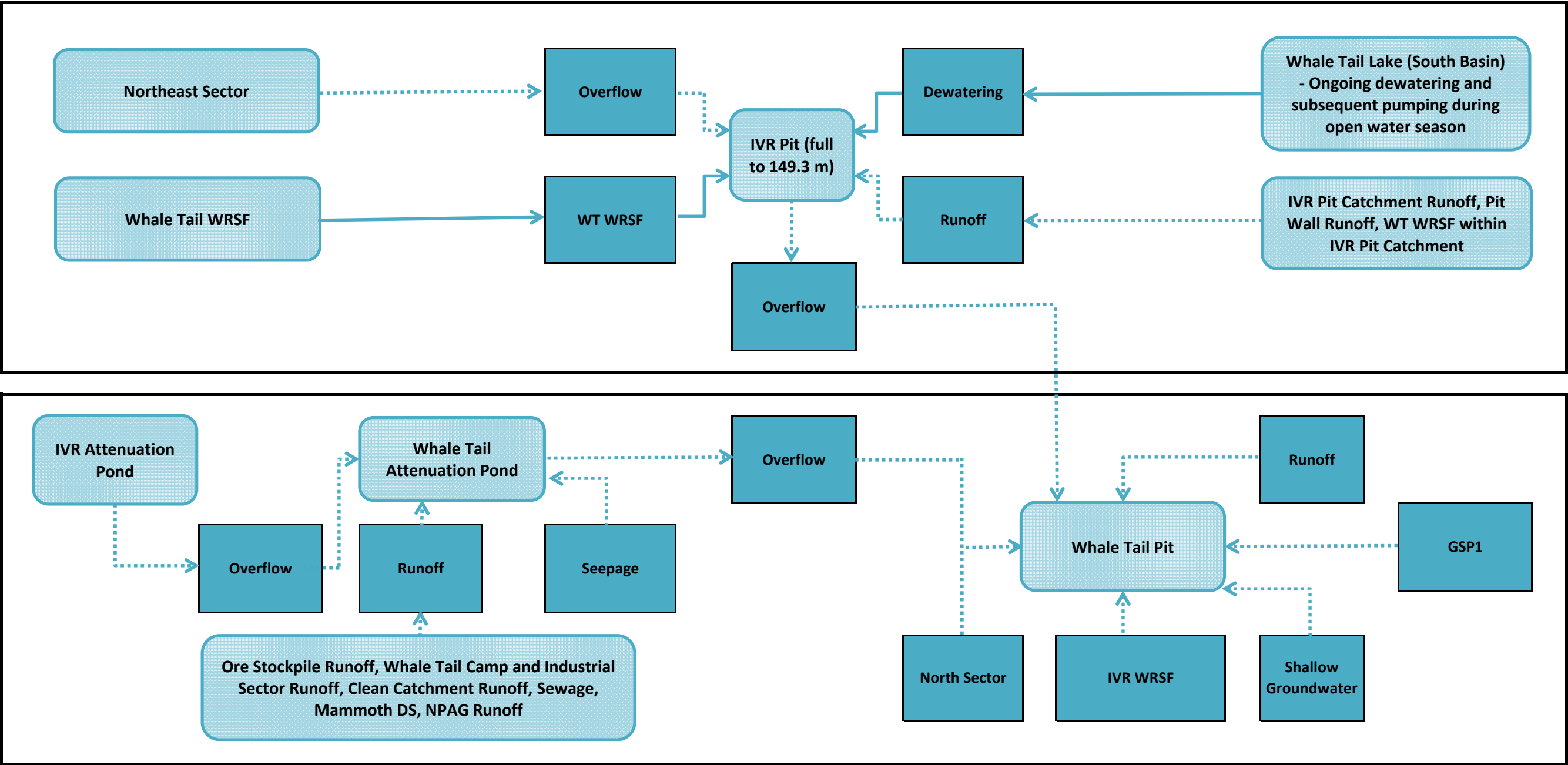


Gravity

Pumping

\*Small water transfers are not shown on this drawing, refer to water balance tables for detailed water movement.

General Water Movement - Closure (Active Flooding): IVR and Whale Tail Pits



Legend

- Gravity
- Pumping

\*Small water transfers are not shown on this drawing, refer to water balance tables for detailed water movement.

**APPENDIX C • 2022 WHALE TAIL WATER BALANCE**

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	Month	Nbr days	Water Transfer - WTP Header					WT Attn. Pond											
			Total Water Volume (m3)	Enter 1 for the origin		Enter 1 for the destination		Inflows (m3)											
				IVR attn. pond	WT attn. pond	WTS	MM	Precip/Runoff	WT Pit	MM D/S	NW Sump	A47	Q1	Camp	Road 7 Runoff	AP5	WT WRSF Pond	IVR Pit	IVR Attn Pond
Q1	January-22	31	96,068	1	0	1	0	-2590	0	0	0	0	0	2,038	0	0	0	0	0
	February-22	28	22,373	1	0	1	0	-10290	0	0	0	0	0	2,726	0	0	0	0	0
	March-22	31	0	1	0	1	0	3818	0	0	0	0	0	2,902	0	0	0	0	0
Q2	April-22	30	63,796	1	0	1	0	23139	23,599	0	0	0	0	2,966	0	0	0	0	0
	May-22	31	155,214	1	0	1	0	19760	85,279	0	0	0	0	3,212	0	0	0	0	0
	June-22	30	574,469	1	0	0	1	-52856	69,891	0	2,486	0	0	2,843	0	0	0	0	0
Q3	July-22	31	104,923	1	0	0	1	-1403	56,662	0	0	0	0	2,966	0	0	0	0	0
	August-22	31	364,244	1	0	0	1	-8028	85,059	0	0	0	0	2,992	0	0	0	0	0
	September-22	30	239,305	1	0	0	1	959	122,592	0	4,160	0	0	3,044	0	0	0	0	0
Q4	October-22	31	367,681	1	0	1	0	-8185	35,133	0	0	0	0	3,197	0	0	0	0	0
	November-22	30	0	1	0	1	0	-18024	40,596	0	0	0	0	3,143	0	0	0	0	0
	December-22	31	0	1	0	1	0	-1365	6,276	0	0	0	0	3,920	0	0	0	0	0
2022 AVERAGES & TOTALS			1,988,073					-52474	525,087	0	6,646	0	0	35,947	0	0	0	0	0
Q1	January-23	31	116,139	1	0	1	0	-763	31,759	0	0	0	0	2,418	0	0	0	0	0
	February-23	28	100,000	1	0	1	0	0	0	0	0	0	0	2,418	0	0	0	0	0
	March-23	31	150,000	1	0	1	0	0	0	0	0	0	0	2,418	0	0	0	0	0
Q2	April-23	30	150,000	1	0	1	0	7	0	0	0	0	0	2,418	0	0	0	0	0
	May-23	31	150,000	1	0	1	0	302	0	0	0	0	0	2,418	0	0	0	0	0
	June-23	30	576,000	1	0	0	1	261	0	0	0	0	10,000	2,418	0	0	0	0	0
Q3	July-23	31	350,000	1	0	0	1	49909	0	0	0	0	0	2,418	0	0	0	0	0
	August-23	31	300,000	1	0	0	1	5247	0	0	0	0	0	2,418	0	0	0	0	0
	September-23	30	200,000	1	0	0	1	8848	0	0	0	0	0	2,418	0	0	0	0	0
Q4	October-23	31	216,000	1	0	1	0	26216	0	0	0	0	0	2,418	0	0	0	0	0
	November-23	30	100,000	1	0	1	0	1199	0	0	0	0	0	2,418	0	0	0	0	0
	December-23	31	100,000	1	0	1	0	501	0	0	0	0	0	2,418	0	0	0	0	0
2023 AVERAGES & TOTALS			2,508,139					92489	31,759	0	0	0	10,000	29,016	0	0	0	0	0
Q1	January-24	31	100,000	1	0	1	0	69	0	0	0	0	0	2,418	0	0	0	0	0
	February-24	29	100,000	1	0	1	0	0	0	0	0	0	0	2,418	0	0	0	0	0
	March-24	31	150,000	1	0	1	0	0	0	0	0	0	0	2,418	0	0	0	0	0
Q2	April-24	30	150,000	1	0	1	0	7	0	0	0	0	0	2,418	0	0	0	0	0
	May-24	31	150,000	1	0	1	0	302	0	0	0	0	0	2,418	0	0	0	0	0
	June-24	30	576,000	1	0	0	1	261	0	0	0	0	10,000	2,418	0	0	0	0	0
Q3	July-24	31	350,000	1	0	0	1	49909	0	0	0	0	0	2,418	0	0	0	0	0
	August-24	31	300,000	1	0	0	1	5247	0	0	0	0	0	2,418	0	0	0	0	0
	September-24	30	200,000	1	0	0	1	8848	0	0	0	0	0	2,418	0	0	0	0	0
Q4	October-24	31	216,000	1	0	1	0	26216	0	0	0	0	0	2,418	0	0	0	0	0
	November-24	30	100,000	1	0	1	0	1199	0	0	0	0	0	2,418	0	0	0	0	0
	December-24	31	100,000	1	0	1	0	501	0	0	0	0	0	2,418	0	0	0	0	0
2024 AVERAGES & TOTALS			2,492,000					92489	0	0	0	0	10,000	29,016	0	0	0	0	0

	Month	Nbr days	Water Transfer - WTP Header					WT Attn. Pond											
			Total Water Volume (m3)	Enter 1 for the origin		Enter 1 for the destination		Inflows (m3)											
				IVR attn. pond	WT attn. pond	WTS	MM	Precip/Runoff	WT Pit	MM D/S	NW Sump	A47	Q1	Camp	Road 7 Runoff	AP5	WT WRSF Pond	IVR Pit	IVR Attn Pond
Q1	January-25	31	100,000	1	0	1	0	69	0	0	0	0	0	2,418	0	0	0	0	0
	February-25	28	100,000	1	0	1	0	0	0	0	0	0	0	2,418	0	0	0	0	0
	March-25	31	150,000	1	0	1	0	0	0	0	0	0	0	2,418	0	0	0	0	0
Q2	April-25	30	150,000	1	0	1	0	7	0	0	0	0	0	2,418	0	0	0	0	0
	May-25	31	150,000	1	0	1	0	302	0	0	0	0	0	2,418	0	0	0	0	0
	June-25	30	576,000	1	0	0	1	261	0	0	0	0	10,000	2,418	0	0	0	0	0
Q3	July-25	31	350,000	1	0	0	1	49909	0	0	0	0	0	2,418	0	0	0	0	0
	August-25	31	300,000	1	0	0	1	5247	0	0	0	0	0	2,418	0	0	0	0	0
	September-25	30	200,000	1	0	0	1	8848	0	0	0	0	0	2,418	0	0	0	0	0
Q4	October-25	31	216,000	1	0	1	0	26216	0	0	0	0	0	2,418	0	0	0	0	0
	November-25	30	100,000	1	0	1	0	1199	0	0	0	0	0	2,418	0	0	0	0	0
	December-25	31	100,000	1	0	1	0	501	0	0	0	0	0	2,418	0	0	0	0	0
2025 AVERAGES & TOTALS			2,492,000					92489	0	0	0	0	10,000	29,016	0	0	0	0	0
Q1	January-26	31	100,000	1	0	1	0	69	0	0	0	0	0	2,418	0	0	0	0	0
	February-26	28	100,000	1	0	1	0	0	0	0	0	0	0	2,418	0	0	0	0	0
	March-26	31	150,000	1	0	1	0	0	0	0	0	0	0	2,418	0	0	0	0	0
Q2	April-26	30	150,000	1	0	1	0	7	0	0	0	0	0	2,418	0	0	0	0	0
	May-26	31	150,000	1	0	1	0	302	0	0	0	0	0	2,418	0	0	0	0	0
	June-26	30	576,000	1	0	0	1	261	0	0	0	0	10,000	2,418	0	0	0	0	0
Q3	July-26	31	0	1	0	0	1	49909	0	0	0	0	0	2,418	0	0	0	0	0
	August-26	31	0	1	0	0	1	6472	0	0	0	0	0	2,418	0	0	0	0	0
	September-26	30	0	1	0	0	1	10915	0	0	0	0	0	2,418	0	0	0	0	0
Q4	October-26	31	0	1	0	1	0	32339	0	0	0	0	0	2,418	0	0	0	0	0
	November-26	30	0	1	0	1	0	1199	0	0	0	0	0	2,418	0	0	0	0	0
	December-26	31	0	1	0	1	0	501	0	0	0	0	0	2,418	0	0	0	0	0
2026 AVERAGES & TOTALS			1,226,000					101905	0	0	0	0	10,000	29,016	0	0	0	0	0
Q1	January-27	31	0	1	0	1	0	69	0	0	0	0	0	2,418	0	0	0	0	0
	February-27	28	0	1	0	1	0	0	0	0	0	0	0	2,418	0	0	0	0	0
	March-27	31	0	1	0	1	0	0	0	0	0	0	0	2,418	0	0	0	0	0
Q2	April-27	30	0	1	0	1	0	7	0	0	0	0	0	2,418	0	0	0	0	0
	May-27	31	0	1	0	1	0	302	0	0	0	0	0	2,418	0	0	0	0	0
	June-27	30	0	1	0	0	1	261	0	0	0	0	0	2,418	0	0	0	0	0
Q3	July-27	31	0	1	0	0	1	62113	0	0	0	0	0	2,418	0	0	0	0	0
	August-27	31	0	1	0	0	1	6472	0	0	0	0	0	2,418	0	0	0	0	0
	September-27	30	0	1	0	0	1	10915	0	0	0	0	0	2,418	0	0	0	0	0
Q4	October-27	31	0	1	0	1	0	32339	0	0	0	0	0	2,418	0	0	0	0	0
	November-27	30	0	1	0	1	0	1199	0	0	0	0	0	2,418	0	0	0	0	0
	December-27	31	0	1	0	1	0	501	0	0	0	0	0	2,418	0	0	0	0	0
2027 AVERAGES & TOTALS			0					114109	0	0	0	0	0	29,016	0	0	0	0	0

	Month	Nbr days	Water Transfer - WTP Header					WT Attn. Pond											
			Total Water Volume (m3)	Enter 1 for the origin		Enter 1 for the destination		Inflows (m3)											
				IVR attn. pond	WT attn. pond	WTS	MM	Precip/Runoff	WT Pit	MM D/S	NW Sump	A47	Q1	Camp	Road 7 Runoff	AP5	WT WRSF Pond	IVR Pit	IVR Attn Pond
Q1	January-28	31	0	1	0	1.0	0.0	69	0	0	0	0	0	2,418	0	0	0	0	0
	February-28	29	0	1	0	1.0	0.0	0	0	0	0	0	0	2,418	0	0	0	0	0
	March-28	31	0	1	0	1.0	0.0	0	0	0	0	0	0	2,418	0	0	0	0	0
Q2	April-28	30	0	1	0	1.0	0.0	7	0	0	0	0	0	2,418	0	0	0	0	0
	May-28	31	0	1	0	1.0	0.0	302	0	0	0	0	0	2,418	0	0	0	0	0
	June-28	30	0	1	0	1.0	0.0	261	0	0	0	0	0	2,418	0	0	0	0	0
Q3	July-28	31	0	1	0	1.0	0.0	62113	0	0	0	0	0	2,418	0	0	0	0	0
	August-28	31	0	1	0	1.0	0.0	6472	0	0	0	0	0	2,418	0	0	0	0	0
	September-28	30	0	1	0	1.0	0.0	10915	0	0	0	0	0	2,418	0	0	0	0	0
Q4	October-28	31	0	1	0	1.0	0.0	32339	0	0	0	0	0	2,418	0	0	0	0	0
	November-28	30	0	1	0	1.0	0.0	1199	0	0	0	0	0	2,418	0	0	0	0	0
	December-28	31	0	1	0	1.0	0.0	501	0	0	0	0	0	2,418	0	0	0	0	0
2028 AVERAGES & TOTALS			0					114109	0	0	0	0	0	29,016	0	0	0	0	0



	Month	Nbr days							IVR Attn. Pond										
					Outflows (m3)			Theoretical (Flows)	Inflows (m3)							Outflows (m3)			
			WTS Seepage	A49	WTS (via WTP)	MM (via WTP)	IVR Attn. Pond	Total Pond Volume (Ice + Water) (m³)	Precip / Runoff (m3)	WT Attn. Pond	IVR Pit (South)	WT Pit	A47 / A49	IVR WRSF	WT WRSF	NWS	WTS (via WTP)	MM (via WTP)	Dewatering
Q1	January-22	31	84,832	0	0	0	111,509	118,486	-89,409	111,509	0	0	69,006	0	0	0	96,068	0	0
	February-22	28	37,109	0	0	0	78,750	69,280	-40,746	78,750	0	0	24,781	0	0	0	22,373	0	0
	March-22	31	29,336	0	0	0	0	105,336	-28,840	0	0	0	55,944	0	0	0	0	0	0
Q2	April-22	30	123,552	0	0	0	153,346	125,246	-286,306	153,346	0	0	106,374	0	0	0	63,796	0	0
	May-22	31	41,261	0	0	0	158,016	116,743	128,143	158,016	0	0	36,613	3,293	1,089	0	155,214	0	0
	June-22	30	217,566	0	0	0	313,114	43,558	71,249	313,114	0	228	49,900	20,896	8,462	0	0	574,469	0
Q3	July-22	31	138,559	0	0	0	186,018	54,324	-43,355	186,018	0	574	10,590	11,710	3,572	0	0	104,923	0
	August-22	31	91,182	0	0	0	179,427	46,103	116,875	179,427	0	250	39,188	1,600	970	0	0	364,244	0
	September-22	30	120,299	0	0	0	264,917	32,240	-31,561	264,917	0	685	26,631	15,265	12,915	0	0	239,305	0
Q4	October-22	31	149,722	0	0	0	168,164	43,943	29,507	168,164	0	0	15,076	498	7,659	0	367,681	0	0
	November-22	30	79,200	0	0	0	90,083	58,775	-90,187	90,083	0	0	0	0	0	0	0	0	0
	December-22	31	62,088	0	0	0	46,065	83,629	84,299	46,065	0	0	0	0	0	0	0	0	0
2022 AVERAGES & TOTALS			1,174,706	0	0	0	1,749,409		-180,331	1,749,409	0	1,737	434,103	53,262	34,667	0	705,132	1,282,941	0
Q1	January-23	31	159,857	0	0	0	151,472	125,428	5,836	151,472	0	0	62,721	0	0	0	116,139	0	0
	February-23	28	77,280	0	0	0	100,000	105,126	0	100,000	0	0	43,703	0	0	0	100,000	0	0
	March-23	31	85,560	0	0	0	100,000	93,104	0	100,000	0	0	71,320	0	0	0	150,000	0	0
Q2	April-23	30	82,800	0	0	0	80,000	98,329	11	80,000	0	0	48,680	0	0	0	150,000	0	0
	May-23	31	85,560	0	0	0	80,000	106,609	477	80,000	0	0	54,592	0	0	0	150,000	0	0
	June-23	30	82,800	0	0	0	250,000	-47,912	412	250,000	49,849	0	139,292	19,879	60,000	15,135	0	576,000	0
Q3	July-23	31	85,560	0	0	0	120,000	-30,025	32,467	120,000	5,095	0	100,189	1,996	25,000	1,520	0	350,000	0
	August-23	31	85,560	0	0	0	100,000	-36,800	3,631	100,000	9,434	0	103,952	3,367	15,000	2,563	0	300,000	0
	September-23	30	82,800	0	0	0	100,000	-42,734	6,123	100,000	25,008	0	118,492	9,975	15,000	7,594	0	200,000	0
Q4	October-23	31	85,560	0	0	0	60,000	11,459	18,141	60,000	0	0	54,546	0	0	0	216,000	0	0
	November-23	30	82,800	0	0	0	60,000	37,876	1,891	60,000	0	0	60,286	0	0	0	100,000	0	0
	December-23	31	85,560	0	0	0	60,000	66,355	789	60,000	0	0	53,053	0	0	0	100,000	0	0
2023 AVERAGES & TOTALS			1,081,697	0	0	0	1,261,472		69,777	1,261,472	89,386	0	910,826	35,217	115,000	26,812	1,082,139	1,426,000	0
Q1	January-24	31	85,560	0	0	0	100,000	54,402	108	100,000	0	0	62,721	0	0	0	100,000	0	0
	February-24	29	80,040	0	0	0	100,000	36,860	0	100,000	0	0	43,703	0	0	0	100,000	0	0
	March-24	31	85,560	0	0	0	100,000	24,838	0	100,000	0	0	71,320	0	0	0	150,000	0	0
Q2	April-24	30	82,800	0	0	0	80,000	30,062	11	80,000	0	0	48,680	0	0	0	150,000	0	0
	May-24	31	85,560	0	0	0	80,000	38,343	477	80,000	0	0	54,592	0	0	0	150,000	0	0
	June-24	30	82,800	0	0	0	250,000	-116,178	412	250,000	49,849	0	139,292	19,879	60,000	15,135	0	576,000	0
Q3	July-24	31	85,560	0	0	0	120,000	-98,292	32,467	120,000	5,095	0	100,189	1,996	25,000	1,520	0	350,000	0
	August-24	31	85,560	0	0	0	100,000	-105,067	3,631	100,000	9,434	0	103,952	3,367	15,000	2,563	0	300,000	0
	September-24	30	82,800	0	0	0	100,000	-111,000	6,123	100,000	25,008	0	118,492	9,975	15,000	7,594	0	200,000	0
Q4	October-24	31	85,560	0	0	0	60,000	-56,807	18,141	60,000	0	0	54,546	0	0	0	216,000	0	0
	November-24	30	82,800	0	0	0	60,000	-30,390	1,891	60,000	0	0	60,286	0	0	0	100,000	0	0
	December-24	31	85,560	0	0	0	60,000	-1,911	789	60,000	0	0	53,053	0	0	0	100,000	0	0
2024 AVERAGES & TOTALS			1,010,160	0	0	0	1,210,000		64,049	1,210,000	89,386	0	910,826	35,217	115,000	26,812	1,066,000	1,426,000	0

	Month	Nbr days							IVR Attn. Pond										
					Outflows (m3)			Theoretical (Flows)	Inflows (m3)								Outflows (m3)		
			WTS Seepage	A49	WTS (via WTP)	MM (via WTP)	IVR Attn. Pond	Total Pond Volume (Ice + Water) (m³)	Precip / Runoff (m3)	WT Attn. Pond	IVR Pit (South)	WT Pit	A47 / A49	IVR WRSF	WT WRSF	NWS	WTS (via WTP)	MM (via WTP)	Dewatering
Q1	January-25	31	85,560	0	0	0	100,000	-13,865	108	100,000	0	0	62,721	0	0	0	100,000	0	0
	February-25	28	77,280	0	0	0	100,000	-34,167	0	100,000	0	0	43,703	0	0	0	100,000	0	0
	March-25	31	85,560	0	0	0	100,000	-46,189	0	100,000	0	0	71,320	0	0	0	150,000	0	0
Q2	April-25	30	82,800	0	0	0	80,000	-40,964	11	80,000	0	0	48,680	0	0	0	150,000	0	0
	May-25	31	85,560	0	0	0	80,000	-32,684	477	80,000	0	0	54,592	0	0	0	150,000	0	0
	June-25	30	82,800	0	0	0	250,000	-187,205	412	250,000	49,849	0	139,292	19,879	60,000	15,135	0	576,000	0
Q3	July-25	31	85,560	0	0	0	120,000	-169,318	32,467	120,000	5,095	0	100,189	1,996	25,000	1,520	0	350,000	0
	August-25	31	85,560	0	0	0	100,000	-176,093	3,631	100,000	9,434	0	103,952	3,367	15,000	2,563	0	300,000	0
	September-25	30	82,800	0	0	0	100,000	-182,026	6,123	100,000	25,008	0	118,492	9,975	15,000	7,594	0	200,000	0
Q4	October-25	31	85,560	0	0	0	60,000	-127,833	18,141	60,000	0	0	54,546	0	0	0	216,000	0	0
	November-25	30	82,800	0	0	0	60,000	-101,416	1,891	60,000	0	0	60,286	0	0	0	100,000	0	0
	December-25	31	85,560	0	0	0	60,000	-72,937	789	60,000	0	0	53,053	0	0	0	100,000	0	0
2025 AVERAGES & TOTALS			1,007,400	0	0	0	1,210,000		64,049	1,210,000	89,386	0	910,826	35,217	115,000	26,812	1,066,000	1,426,000	0
Q1	January-26	31	85,560	0	0	0	100,000	-84,891	108	100,000	0	0	62,721	0	0	0	100,000	0	0
	February-26	28	77,280	0	0	0	100,000	-105,193	0	100,000	0	0	43,703	0	0	0	100,000	0	0
	March-26	31	85,560	0	0	0	100,000	-117,215	0	100,000	0	0	71,320	0	0	0	150,000	0	0
Q2	April-26	30	82,800	0	0	0	80,000	-111,990	11	80,000	0	0	48,680	0	0	0	150,000	0	0
	May-26	31	85,560	0	0	0	80,000	-103,710	477	80,000	0	0	54,592	0	0	0	150,000	0	0
	June-26	30	82,800	0	0	0	250,000	-258,231	412	250,000	49,849	0	139,292	19,879	60,000	15,135	0	576,000	0
Q3	July-26	31	85,560	0	0	0	0	-120,344	32,467	0	0	0	0	0	0	0	0	0	0
	August-26	31	85,560	0	0	0	0	-25,893	3,631	0	0	0	0	0	0	0	0	0	0
	September-26	30	82,800	0	0	0	0	70,240	6,123	0	0	0	0	0	0	0	0	0	0
Q4	October-26	31	85,560	0	0	0	0	190,557	18,141	0	0	0	0	0	0	0	0	0	0
	November-26	30	82,800	0	0	0	0	276,974	1,891	0	0	0	0	0	0	0	0	0	0
	December-26	31	85,560	0	0	0	0	365,452	789	0	0	0	0	0	0	0	0	0	0
2026 AVERAGES & TOTALS			1,007,400	0	0	0	710,000		64,049	710,000	49,849	0	420,308	19,879	60,000	15,135	650,000	576,000	0
Q1	January-27	31	85,560	0	0	0	0	453,499	108	0	0	0	0	0	0	0	0	0	0
	February-27	28	77,280	0	0	0	0	533,197	0	0	0	0	0	0	0	0	0	0	0
	March-27	31	85,560	0	0	0	0	621,175	0	0	0	0	0	0	0	0	0	0	0
Q2	April-27	30	82,800	0	0	0	0	706,400	11	0	0	0	0	0	0	0	0	0	0
	May-27	31	85,560	0	0	0	0	794,680	477	0	0	0	0	0	0	0	0	0	0
	June-27	30	82,800	0	0	0	0	880,159	412	0	0	0	0	0	0	0	0	0	0
Q3	July-27	31	85,560	0	0	0	0	1,030,250	32,467	0	0	0	0	0	0	0	0	0	0
	August-27	31	85,560	0	0	0	0	1,124,700	3,631	0	0	0	0	0	0	0	0	0	0
	September-27	30	82,800	0	0	0	0	1,220,834	6,123	0	0	0	0	0	0	0	0	0	0
Q4	October-27	31	85,560	0	0	0	0	1,341,151	18,141	0	0	0	0	0	0	0	0	0	0
	November-27	30	82,800	0	0	0	0	1,427,568	1,891	0	0	0	0	0	0	0	0	0	0
	December-27	31	85,560	0	0	0	0	1,516,046	789	0	0	0	0	0	0	0	0	0	0
2027 AVERAGES & TOTALS			1,007,400	0	0	0	0		64,049	0	0	0	0	0	0	0	0	0	0

	Month	Nbr days							IVR Attn. Pond										
					Outflows (m3)			Theoretical (Flows)	Inflows (m3)							Outflows (m3)			
			WTS Seepage	A49	WTS (via WTP)	MM (via WTP)	IVR Attn. Pond	Total Pond Volume (Ice + Water) (m³)	Precip / Runoff (m3)	WT Attn. Pond	IVR Pit (South)	WT Pit	A47 / A49	IVR WRSF	WT WRSF	NWS	WTS (via WTP)	MM (via WTP)	Dewatering
Q1	January-28	31	108,000	0	0	0	0	1,626,533	108	0	0	0	0	0	0	0	0	0	0
	February-28	29	108,000	0	0	0	0	1,736,951	0	0	0	0	0	0	0	0	0	0	0
	March-28	31	108,000	0	0	0	0	1,847,369	0	0	0	0	0	0	0	0	0	0	0
Q2	April-28	30	108,000	0	0	0	0	1,957,794	11	0	0	0	0	0	0	0	0	0	0
	May-28	31	108,000	0	0	0	0	2,068,514	477	0	0	0	0	0	0	0	0	0	0
	June-28	30	108,000	0	0	0	0	2,179,193	412	0	0	0	0	0	0	0	0	0	0
Q3	July-28	31	108,000	0	0	0	0	2,351,724	32,467	0	0	0	0	0	0	0	0	0	0
	August-28	31	108,000	0	0	0	0	2,468,614	3,631	0	0	0	0	0	0	0	0	0	0
	September-28	30	108,000	0	0	0	0	2,589,947	6,123	0	0	0	0	0	0	0	0	0	0
Q4	October-28	31	108,000	0	0	0	0	2,732,704	18,141	0	0	0	0	0	0	0	0	0	0
	November-28	30	108,000	0	0	0	0	2,844,321	1,891	0	0	0	0	0	0	0	0	0	0
	December-28	31	108,000	0	0	0	0	2,955,240	789	0	0	0	0	0	0	0	0	0	0
2028 AVERAGES & TOTALS			1,296,000	0	0	0	0		64,049	0	0	0	0	0	0	0	0	0	0

	Month	Nbr days		WT WRSF Pond					Mammoth Lake						
			Theoretical (Flows)	Inflows (m3)		Outflows (m3)		Theoretical (Flows)	Inflows (m3)				Theoretical (Flows)	Inflows (m3)	
			Total Pond Volume (Ice + Water) (m³)	Precip / Runoff (m3)	WRSF	WT Attn. Pond	IVR Attn. Pond	Total Pond Volume (Ice + Water) (m³)	Runoff + direct precip (m3)	WTP (East + West Diffusors)	WTS	SWTCH	Total Lake Volume (Ice+Water) (m3)	Precip / Runoff (m3)	WTD Seepage
Q1	January-22	31	425,749	0	0	0	0	3,390	0	0	0	0	5,373,488	-316,509	0
	February-22	28	466,161	0	0	0	0	3,390	-13,167	0	0	0	5,360,321	-268,501	0
	March-22	31	493,264	0	0	0	0	3,390	-13,167	0	0	0	5,347,154	-446,305	0
Q2	April-22	30	402,882	0	0	0	0	3,390	0	0	0	0	5,347,154	-234,101	0
	May-22	31	574,822	1,491	0	0	1,089	3,792	92,170	0	0	0	5,439,324	522,444	0
	June-22	30	464,202	4,774	3,286	0	8,462	3,390	-257,555	164,317	0	254,979	5,601,065	1,946,140	0
Q3	July-22	31	528,388	3,572	0	0	3,572	3,390	-568,528	104,923	0	66,950	5,204,409	-426,602	0
	August-22	31	502,454	970	0	0	970	3,390	-115,891	364,244	0	0	5,452,762	-1,138,344	0
	September-22	30	552,001	19,500	1,000	0	12,915	10,975	-138,277	239,305	0	6,476	5,560,266	431,099	0
Q4	October-22	31	405,224	9,406	0	0	7,659	12,722	-113,775	0	0	196,982	5,643,474	158,119	0
	November-22	30	405,120	-9,332	0	0	0	3,390	-73,019	0	0	57,971	5,628,425	-445,962	0
	December-22	31	535,484	-102	0	0	0	3,288	-289,172	0			5,339,254	374,602	0
2022 AVERAGES & TOTALS				30,279	4,286	0	34,667		-1490383	872789	0	583359		156079	0
Q1	January-23	31	639,374	-209	0	0	0	3,079	0	0			5,339,254	-116,139	0
	February-23	28	683,077	0	0	0	0	3,079	0	0			5,339,254	-100,000	0
	March-23	31	704,397	0	0	0	0	3,079	0	0			5,339,254	-150,000	0
Q2	April-23	30	683,088	2	0	0	0	3,082	0	0			5,339,254	-150,000	0
	May-23	31	668,156	104	0	0	0	3,186	0	0			5,339,254	-150,000	0
	June-23	30	626,724	90	10,000	0	60,000	-46,724	-288,000	288,000			5,339,254	462,000	0
Q3	July-23	31	562,991	25,869	9,000	0	25,000	-36,855	-350,000	350,000			5,339,254	750,000	0
	August-23	31	500,938	2,679	4,000	0	15,000	-45,176	-300,000	300,000			5,339,254	300,000	0
	September-23	30	583,130	4,518	3,500	0	15,000	-52,158	-200,000	200,000			5,339,254	300,000	0
Q4	October-23	31	499,817	13,385	0	0	0	-38,773	-108,000	108,000			5,339,254	92,000	0
	November-23	30	521,993	414	0	0	0	-38,359	0	0			5,339,254	-50,000	0
	December-23	31	535,835	173	0	0	0	-38,186	0	0			5,339,254	-100,000	0
2023 AVERAGES & TOTALS				47,026	26,500	0	115,000		-1246000	1246000	0	0		1087861	0
Q1	January-24	31	598,665	24	0	0	0	-38,162	0	0			5,339,254	-100,000	0
	February-24	29	642,368	0	0	0	0	-38,162	0	0			5,339,254	-100,000	0
	March-24	31	663,688	0	0	0	0	-38,162	0	0			5,339,254	-150,000	0
Q2	April-24	30	642,378	2	0	0	0	-38,160	0	0			5,339,254	-150,000	0
	May-24	31	627,447	104	0	0	0	-38,055	0	0			5,339,254	-150,000	0
	June-24	30	586,014	90	10,000	0	60,000	-87,965	-288,000	288,000			5,339,254	462,000	0
Q3	July-24	31	522,282	25,869	9,000	0	25,000	-78,096	-350,000	350,000			5,339,254	750,000	0
	August-24	31	460,229	2,679	4,000	0	15,000	-86,417	-300,000	300,000			5,339,254	300,000	0
	September-24	30	542,421	4,518	3,500	0	15,000	-93,399	-200,000	200,000			5,339,254	300,000	0
Q4	October-24	31	459,107	13,385	0	0	0	-80,014	-108,000	108,000			5,339,254	92,000	0
	November-24	30	481,284	414	0	0	0	-79,600	0	0			5,339,254	-50,000	0
	December-24	31	495,126	173	0	0	0	-79,427	0	0			5,339,254	-100,000	0
2024 AVERAGES & TOTALS				47,259	26,500	0	115,000		-1246000	1246000	0	0		1104000	0

	Month	Nbr days		WT WRSF Pond					Mammoth Lake						
			Theoretical (Flows)	Inflows (m3)		Outflows (m3)		Theoretical (Flows)	Inflows (m3)			Theoretical (Flows)	Inflows (m3)		
			Total Pond Volume (Ice + Water) (m³)	Precip / Runoff (m3)	WRSF	WT Attn. Pond	IVR Attn. Pond	Total Pond Volume (Ice + Water) (m³)	Runoff + direct precip (m3)	WTP (East + West Diffusors)	WTS	SWTCH	Total Lake Volume (Ice+Water) (m3)	Precip / Runoff (m3)	WTD Seepage
Q1	January-25	31	557,955	24	0	0	0	-79,403	0	0			5,339,254	-100,000	0
	February-25	28	601,659	0	0	0	0	-79,403	0	0			5,339,254	-100,000	0
	March-25	31	622,979	0	0	0	0	-79,403	0	0			5,339,254	-150,000	0
Q2	April-25	30	601,669	2	0	0	0	-79,401	0	0			5,339,254	-150,000	0
	May-25	31	586,738	104	0	0	0	-79,297	0	0			5,339,254	-150,000	0
	June-25	30	545,305	90	10,000	0	60,000	-129,207	-288,000	288,000			5,339,254	462,000	0
Q3	July-25	31	481,573	25,869	9,000	0	25,000	-119,338	-350,000	350,000			5,339,254	750,000	0
	August-25	31	419,520	2,679	4,000	0	15,000	-127,659	-300,000	300,000			5,339,254	300,000	0
	September-25	30	501,712	4,518	3,500	0	15,000	-134,641	-200,000	200,000			5,339,254	300,000	0
Q4	October-25	31	418,398	13,385	0	0	0	-121,255	-108,000	108,000			5,339,254	92,000	0
	November-25	30	440,575	414	0	0	0	-120,841	0	0			5,339,254	-50,000	0
	December-25	31	454,417	173	0	0	0	-120,669	0	0			5,339,254	-100,000	0
2025 AVERAGES & TOTALS				47,259	26,500	0	115,000	-1246000		1246000	0	0		1104000	0
Q1	January-26	31	517,246	24	0	0	0	-120,645	0	0			5,339,254	-100,000	0
	February-26	28	560,949	0	0	0	0	-120,645	0	0			5,339,254	-100,000	0
	March-26	31	582,270	0	0	0	0	-120,645	0	0			5,339,254	-150,000	0
Q2	April-26	30	560,960	2	0	0	0	-120,643	0	0			5,339,254	-150,000	0
	May-26	31	546,029	104	0	0	0	-120,538	0	0			5,339,254	-150,000	0
	June-26	30	504,596	90	10,000	0	60,000	-170,448	-288,000	288,000			5,339,254	462,000	0
Q3	July-26	31	537,063	25,869	0	0	0	-144,579	0	0			5,339,254	750,000	0
	August-26	31	540,694	2,679	0	0	0	-141,900	0	0			5,339,254	300,000	0
	September-26	30	546,817	4,518	0	0	0	-137,382	0	0			5,339,254	300,000	0
Q4	October-26	31	564,958	13,385	0	0	0	-123,997	0	0			5,339,254	200,000	0
	November-26	30	566,849	414	0	0	0	-123,583	0	0			5,339,254	50,000	0
	December-26	31	567,638	173	0	0	0	-123,410	0	0			5,339,254	0	0
2026 AVERAGES & TOTALS				47,259	10,000	0	60,000	-288000		288000	0	0		1412000	0
Q1	January-27	31	567,746	24	0	0	0	-123,386	0	0			5,339,254	0	0
	February-27	28	567,746	0	0	0	0	-123,386	0	0			5,339,254	0	0
	March-27	31	567,746	0	0	0	0	-123,386	0	0			5,339,254	0	0
Q2	April-27	30	567,757	2	0	0	0	-123,384	0	0			5,339,254	0	0
	May-27	31	568,234	104	0	0	0	-123,280	0	0			5,339,254	0	0
	June-27	30	568,645	90	0	0	0	-123,189	0	0			5,339,254	747,028	0
Q3	July-27	31	601,113	25,869	0	0	0	-97,320	0	0			5,339,254	317,682	0
	August-27	31	604,744	2,679	0	0	0	-94,641	0	0			5,339,254	360,300	0
	September-27	30	610,867	4,518	0	0	0	-90,124	0	0			5,339,254	251,587	0
Q4	October-27	31	629,008	13,385	0	0	0	-76,738	0	0			5,339,254	218,411	0
	November-27	30	630,898	414	0	0	0	-76,324	0	0			5,339,254	46,062	0
	December-27	31	631,688	173	0	0	0	-76,151	0	0			5,339,254	0	0
2027 AVERAGES & TOTALS				47,259	0	0	0	0		0	0	0		1941070	0

	Month	Nbr days		WT WRSF Pond					Mammoth Lake						
			Theoretical (Flows)	Inflows (m3)		Outflows (m3)		Theoretical (Flows)	Inflows (m3)				Theoretical (Flows)	Inflows (m3)	
			Total Pond Volume (Ice + Water) (m <sup>3</sup> )	Precip / Runoff (m3)	WRSF	WT Attn. Pond	IVR Attn. Pond	Total Pond Volume (Ice + Water) (m <sup>3</sup> )	Runoff + direct precip (m3)	WTP (East + West Diffusors)	WTS	SWTCH	Total Lake Volume (Ice+Water) (m3)	Precip / Runoff (m3)	WTD Seepage
Q1	January-28	31	631,796	24	0	0	0	-76,128	0	0			5,339,254	0	0
	February-28	29	631,796	0	0	0	0	-76,128	0	0			5,339,254	0	0
	March-28	31	631,796	0	0	0	0	-76,128	0	0			5,339,254	0	0
Q2	April-28	30	631,807	2	0	0	0	-76,125	0	0			5,339,254	0	0
	May-28	31	632,283	104	0	0	0	-76,021	0	0			5,339,254	0	0
	June-28	30	632,695	90	0	0	0	-75,931	0	0			5,339,254	0	0
Q3	July-28	31	665,162	25,869	0	0	0	-50,062	0	0			5,339,254	0	0
	August-28	31	668,793	2,679	0	0	0	-47,383	0	0			5,339,254	0	0
	September-28	30	674,916	4,518	0	0	0	-42,865	0	0			5,339,254	0	0
Q4	October-28	31	693,057	13,385	0	0	0	-29,480	0	0			5,339,254	0	0
	November-28	30	694,948	414	0	0	0	-29,066	0	0			5,339,254	0	0
	December-28	31	695,737	173	0	0	0	-28,893	0	0			5,339,254	0	0
2028 AVERAGES & TOTALS				47,259	0	0	0		0	0	0	0		0	0



	Month	Nbr days	WTS				AP5 / GSP-1						Water Transfers				
			WTP (Temp + Perm Diffusors)	Outflows (m3)		Theoretical (Flows)	Inflows (m3)			Outflows (m3)		Theoretical (Flows)	WTS	WTS	Estimated Runoff	Estimated Runoff	Estimated Runoff
				SWTCH	MM Lake	Total Lake Volume (Ice+Water) (m3)	Runoff + direct precip (m3)	Under Ground Portal	WT Attn. Pond	WT Attn. Pond	GSP 2	Total Lake Volume (Ice+Water) (m3)	WT Pit (Reflooding)	IVR Pit (Reflooding)	GSP-1	WT WRSF	WT Attn. Pond
Q1	January-22	31	96,068	0	0	12,553,508	21	0	0	0	0	45,787			21	24	69
	February-22	28	22,373	0	0	12,307,380	0	0	0	0	0	45,787			0	0	0
	March-22	31	0	0	0	11,861,075	0	0	0	0	0	45,787			0	0	0
Q2	April-22	30	63,796	0	0	11,690,771	2	0	0	0	0	45,789			2	2	7
	May-22	31	155,214	0	0	12,368,429	92	0	0	0	0	46,377			92	104	302
	June-22	30	410,152	254,979	0	14,469,741	79	832	0	0	0	47,567			79	90	261
Q3	July-22	31	0	66,950	0	13,976,189	5,238	859	0	0	0	52,863			5,238	25,869	49,909
	August-22	31	0	0	0	12,837,845	597	859	0	0	0	53,585			597	2,679	5,247
	September-22	30	0	6,476	0	13,262,468	1,007	0	0	0	0	55,030			1,007	4,518	8,848
Q4	October-22	31	367,681	196,982	0	13,591,285	2,984	0	0	0	0	59,213			2,984	13,385	26,216
	November-22	30	0	57,971	0	13,087,352	364	0	0	0	0	60,969			364	414	1,199
	December-22	31	0	0	0	13,461,954	152	0	0	0	0	61,493			152	173	501
2022 AVERAGES & TOTALS			1115284	583359	0		10536	2550	0	0	0		0	0	10,536	47,259	92,558
Q1	January-23	31	116,139	0	0	13,461,954	21	0	0	0	0	61,886			21	24	69
	February-23	28	100,000	0	0	13,461,954	0	0	0	0	0	62,222			0	0	0
	March-23	31	150,000	0	0	13,461,954	0	0	0	0	0	62,594			0	0	0
Q2	April-23	30	150,000	0	0	13,461,954	2	0	0	0	0	62,956			2	2	7
	May-23	31	150,000	0	0	13,461,954	92	0	0	0	0	62,576			92	104	302
	June-23	30	288,000	750,000	0	13,461,954	79	850	0	0	0	62,890			79	90	261
Q3	July-23	31	0	750,000	0	13,461,954	5,238	850	0	0	0	66,768			5,238	25,869	49,909
	August-23	31	0	300,000	0	13,461,954	597	850	0	0	0	65,944			597	2,679	5,247
	September-23	30	0	300,000	0	13,461,954	1,007	0	0	0	0	65,925			1,007	4,518	8,848
Q4	October-23	31	108,000	200,000	0	13,461,954	2,984	0	0	0	0	68,120			2,984	13,385	26,216
	November-23	30	100,000	50,000	0	13,461,954	364	0	0	0	0	68,483			364	414	1,199
	December-23	31	100,000	0	0	13,461,954	152	0	0	0	0	68,635			152	173	501
2023 AVERAGES & TOTALS			1262139	2350000	0		10536	2550	0	0	0		0	0	10,536	47,259	92,558
Q1	January-24	31	100,000	0	0	13,461,954	21	0	0	0	0	68,656			21	24	69
	February-24	29	100,000	0	0	13,461,954	0	0	0	0	0	68,656			0	0	0
	March-24	31	150,000	0	0	13,461,954	0	0	0	0	0	68,656			0	0	0
Q2	April-24	30	150,000	0	0	13,461,954	2	0	0	0	0	68,658			2	2	7
	May-24	31	150,000	0	0	13,461,954	92	0	0	0	0	67,748			92	104	302
	June-24	30	288,000	750,000	0	13,461,954	79	850	0	0	0	67,839			79	90	261
Q3	July-24	31	0	750,000	0	13,461,954	5,238	850	0	0	0	71,597			5,238	25,869	49,909
	August-24	31	0	300,000	0	13,461,954	597	850	0	0	0	70,248			597	2,679	5,247
	September-24	30	0	300,000	0	13,461,954	1,007	0	0	0	0	69,530			1,007	4,518	8,848
Q4	October-24	31	108,000	200,000	0	13,461,954	2,984	0	0	0	0	71,875			2,984	13,385	26,216
	November-24	30	100,000	50,000	0	13,461,954	364	0	0	0	0	72,239			364	414	1,199
	December-24	31	100,000	0	0	13,461,954	152	0	0	0	0	72,391			152	173	501
2024 AVERAGES & TOTALS			1246000	2350000	0		10536	2550	0	0	0		0	0	10,536	47,259	92,558

	Month	Nbr days	WTS				AP5 / GSP-1						Water Transfers				
			WTP (Temp + Perm Diffusors)	Outflows (m3)		Theoretical (Flows)	Inflows (m3)			Outflows (m3)		Theoretical (Flows)	WTS	WTS	Estimated Runoff	Estimated Runoff	Estimated Runoff
				SWTCH	MM Lake	Total Lake Volume (Ice+Water) (m3)	Runoff + direct precip (m3)	Under Ground Portal	WT Attn. Pond	WT Attn. Pond	GSP 2	Total Lake Volume (Ice+Water) (m3)	WT Pit (Reflooding)	IVR Pit (Reflooding)	GSP-1	WT WRSF	WT Attn. Pond
Q1	January-25	31	100,000	0	0	13,461,954	21	0	0	0	0	72,745			21	24	69
	February-25	28	100,000	0	0	13,461,954	0	0	0	0	0	72,959			0	0	0
	March-25	31	150,000	0	0	13,461,954	0	0	0	0	0	73,293			0	0	0
Q2	April-25	30	150,000	0	0	13,461,954	2	0	0	0	0	73,579			2	2	7
	May-25	31	150,000	0	0	13,461,954	92	0	0	0	0	74,856			92	104	302
	June-25	30	288,000	750,000	0	13,461,954	79	850	0	0	0	76,768			79	90	261
Q3	July-25	31	0	750,000	0	13,461,954	5,238	850	0	0	0	82,261			5,238	25,869	49,909
	August-25	31	0	300,000	0	13,461,954	597	850	0	0	0	83,095			597	2,679	5,247
	September-25	30	0	300,000	0	13,461,954	1,007	0	0	0	0	84,529			1,007	4,518	8,848
Q4	October-25	31	108,000	200,000	0	13,461,954	2,984	0	0	0	0	88,887			2,984	13,385	26,216
	November-25	30	100,000	50,000	0	13,461,954	364	0	0	0	0	89,724			364	414	1,199
	December-25	31	100,000	0	0	13,461,954	152	0	0	0	0	90,389			152	173	501
2025 AVERAGES & TOTALS			1246000	2350000	0		10536	2550	0	0	0		0	0	10,536	47,259	92,558
Q1	January-26	31	100,000	0	0	13,461,954	21	0	0	0	0	90,760			21	24	69
	February-26	28	100,000	0	0	13,461,954	0	0	0	0	0	91,005			0	0	0
	March-26	31	150,000	0	0	13,461,954	0	0	0	0	0	91,355			0	0	0
Q2	April-26	30	150,000	0	0	13,461,954	2	0	0	0	0	91,664			2	2	7
	May-26	31	150,000	0	0	13,461,954	92	0	0	0	0	92,952			92	104	302
	June-26	30	288,000	750,000	0	13,461,954	79	850	0	0	0	94,881			79	90	261
Q3	July-26	31	0	750,000	0	13,461,954	5,238	850	0	0	0	100,193		1,395,000	5,238	25,869	49,909
	August-26	31	0	300,000	0	13,461,954	597	850	0	0	0	100,847		1,395,000	597	2,679	6,472
	September-26	30	0	300,000	0	13,461,954	1,007	0	0	0	0	102,106		1,350,000	1,007	4,518	10,915
Q4	October-26	31	0	200,000	0	13,461,954	2,984	0	0	0	0	106,833		1,395,000	2,984	13,385	32,339
	November-26	30	0	50,000	0	13,461,954	364	0	0	0	0	108,247		45,000	364	414	1,199
	December-26	31	0	0	0	13,461,954	152	0	0	0	0	109,484			152	173	501
2026 AVERAGES & TOTALS			938000	2350000	0		10536	2550	0	0	0		0	5,580,000	10,536	47,259	101,974
Q1	January-27	31	0	0	0	13,461,954	21	0	0	0	0	110,435		0	21	24	69
	February-27	28	0	0	0	13,461,954	0	0	0	0	0	111,275		0	0	0	0
	March-27	31	0	0	0	13,461,954	0	0	0	0	0	112,205		0	0	0	0
Q2	April-27	30	0	0	0	13,461,954	2	0	0	0	0	113,107		0	2	2	7
	May-27	31	0	0	0	13,461,954	92	0	0	0	0	114,373		0	92	104	302
	June-27	30	0	747,028	0	13,461,954	79	850	0	0	0	116,284		2,087,479	79	90	261
Q3	July-27	31	0	317,682	0	13,461,954	5,238	850	0	0	0	121,764		54,907	5,238	25,869	62,113
	August-27	31	0	360,300	0	13,461,954	597	850	0	0	0	122,405		102,179	597	2,679	6,472
	September-27	30	0	251,587	0	13,461,954	1,007	0	0	0	0	123,657		621,391	1,007	4,518	10,915
Q4	October-27	31	0	218,411	0	13,461,954	2,984	0	0	0	0	127,636		21,305	2,984	13,385	32,339
	November-27	30	0	46,062	0	13,461,954	364	0	0	0	0	128,900		0	364	414	1,199
	December-27	31	0	0	0	13,461,954	152	0	0	0	0	129,982		0	152	173	501
2027 AVERAGES & TOTALS			0	1941070	0		10536	2550	0	0	0		0	2,887,260	10,536	47,259	114,178



	Month	Nbr days	WTS				AP5 / GSP-1						Water Transfers				
				Outflows (m3)		Theoretical (Flows)	Inflows (m3)			Outflows (m3)		Theoretical (Flows)	WTS	WTS	Estimated Runoff	Estimated Runoff	Estimated Runoff
			WTP (Temp + Perm Diffusors)	SWTCH	MM Lake	Total Lake Volume (Ice+Water) (m3)	Runoff + direct precip (m3)	Under Ground Portal	WT Attn. Pond	WT Attn. Pond	GSP 2	Total Lake Volume (Ice+Water) (m3)	WT Pit (Reflooding)	IVR Pit (Reflooding)	GSP-1	WT WRSF	WT Attn. Pond
Q1	January-28	31	0	0	0	13,461,954	21	0	0	0	0	130,003		0	21	24	69
	February-28	29	0	0	0	13,461,954	0	0	0	0	0	130,003		0	0	0	0
	March-28	31	0	0	0	13,461,954	0	0	0	0	0	130,003		0	0	0	0
Q2	April-28	30	0	0	0	13,461,954	2	0	0	0	0	130,005		0	2	2	7
	May-28	31	0	0	0	13,461,954	92	0	0	0	0	130,097		0	92	104	302
	June-28	30	0	0	0	13,461,954	79	0	0	0	0	130,176		2,087,479	79	90	261
Q3	July-28	31	0	0	0	13,461,954	5,238	0	0	0	0	135,414		54,907	5,238	25,869	62,113
	August-28	31	0	0	0	13,461,954	597	0	0	0	0	136,011		102,179	597	2,679	6,472
	September-28	30	0	0	0	13,461,954	1,007	0	0	0	0	137,018		621,391	1,007	4,518	10,915
Q4	October-28	31	0	0	0	13,461,954	2,984	0	0	0	0	140,003		21,305	2,984	13,385	32,339
	November-28	30	0	0	0	13,461,954	364	0	0	0	0	140,366		0	364	414	1,199
	December-28	31	0	0	0	13,461,954	152	0	0	0	0	140,518		0	152	173	501
2028 AVERAGES & TOTALS			0	0	0		10536	0	0	0	0		0	2,887,260	10,536	47,259	114,178

	Month	Nbr days														
			Estimated Runoff	Nemo (HMI)	Camp	WTP	WTP	WTS	WRSF Runoff	WRSF Pond	WRSF Pond	WT Pit	WT Pit (Phase 1 Ramp)	Sump 6	Runoff Road 7	Road 7 Runoff
			IVR Attn. Pond	Freshwater Usage	WT Attn. Pond	WTS (Temp. + Perm. Diffusers)	MM Lake (East + West Diffusers)	MM Lake (SWTCH)	WRSF Pond	WT Attn. Pond	IVR Attn Pond	WT Attn. Pond	MM D/S	IVR Attn Pond	IVR Attn Pond	WT Attn. Pond
Q1	January-22	31	108	2,761	2,038	96,068	0	0	0	0	0	0	0	0	0	0
	February-22	28	0	4,797	2,726	22,373	0	0	0	0	0	0	0	0	0	0
	March-22	31	0	5,185	2,902	0	0	0	0	0	0	0	0	0	0	0
Q2	April-22	30	11	6,353	2,966	63,796	0	0	0	0	0	23,599	0	0	0	0
	May-22	31	477	7,797	3,212	155,214	0	0	0	0	1,089	85,279	0	0	0	0
	June-22	30	412	6,718	2,843	410,152	164,317	254,979	3,286	0	8,462	69,891	0	228	0	0
Q3	July-22	31	32,467	7,147	2,966	0	104,923	66,950	0	0	3,572	56,662	0	574	0	0
	August-22	31	3,631	6,655	2,992	0	364,244	0	0	0	970	85,059	0	250	0	0
	September-22	30	6,123	7,482	3,044	0	239,305	6,476	1,000	0	12,915	122,592	0	685	0	0
Q4	October-22	31	18,141	6,742	3,197	367,681	0	196,982	0	0	7,659	35,133	0	0	0	0
	November-22	30	1,891	7,381	3,143	0	0	57,971	0	0	0	40,596	0	0	0	0
	December-22	31	789	6,165	3,920	0	0	0		0	0	6,276		0	0	
2022 AVERAGES & TOTALS			64,049	75,183	35,947	1,115,284	872,789	583,359	4,286	0	34,667	525,087	0	1,737	0	0
Q1	January-23	31	108	3,555	2,418	116,139	0	0		0	0	31,759		0	0	
	February-23	28	0	3,832	2,418	100,000	0	0		0	0	0		0	0	
	March-23	31	0	3,832	2,418	150,000	0	0		0	0	0		0	0	
Q2	April-23	30	11	3,832	2,418	150,000	0	0		0	0	0		0	0	
	May-23	31	477	3,832	2,418	150,000	0	0		0	0	0		0	0	
	June-23	30	412	3,832	2,418	288,000	288,000	750,000	10,000	0	60,000	0	30,000	0	15,135	
Q3	July-23	31	32,467	3,832	2,418	0	350,000	750,000	9,000	0	25,000	0		0	1,520	
	August-23	31	3,631	3,832	2,418	0	300,000	300,000	4,000	0	15,000	0		0	2,563	
	September-23	30	6,123	3,832	2,418	0	200,000	300,000	3,500	0	15,000	0		0	7,594	
Q4	October-23	31	18,141	3,832	2,418	108,000	108,000	200,000		0	0	0		0	0	
	November-23	30	1,891	3,832	2,418	100,000	0	50,000		0	0	0		0	0	
	December-23	31	789	3,832	2,418	100,000	0	0		0	0	0		0	0	
2023 AVERAGES & TOTALS			64,049	45,707	29,016	1,262,139	1,246,000	2,350,000	26,500	0	115,000	31,759	30,000	0	26,812	0
Q1	January-24	31	108	3,832	2,418	100,000	0	0		0	0	0		0	0	
	February-24	29	0	3,832	2,418	100,000	0	0		0	0	0		0	0	
	March-24	31	0	3,832	2,418	150,000	0	0		0	0	0		0	0	
Q2	April-24	30	11	3,832	2,418	150,000	0	0		0	0	0		0	0	
	May-24	31	477	3,832	2,418	150,000	0	0		0	0	0		0	0	
	June-24	30	412	3,832	2,418	288,000	288,000	750,000	10,000	0	60,000	0	30,000	0	15,135	
Q3	July-24	31	32,467	3,832	2,418	0	350,000	750,000	9,000	0	25,000	0		0	1,520	
	August-24	31	3,631	3,832	2,418	0	300,000	300,000	4,000	0	15,000	0		0	2,563	
	September-24	30	6,123	3,832	2,418	0	200,000	300,000	3,500	0	15,000	0		0	7,594	
Q4	October-24	31	18,141	3,832	2,418	108,000	108,000	200,000		0	0	0		0	0	
	November-24	30	1,891	3,832	2,418	100,000	0	50,000		0	0	0		0	0	
	December-24	31	789	3,832	2,418	100,000	0	0		0	0	0		0	0	
2024 AVERAGES & TOTALS			64,049	45,984	29,016	1,246,000	1,246,000	2,350,000	26,500	0	115,000	0	30,000	0	26,812	0

	Month	Nbr days														
			Estimated Runoff	Nemo (HMI)	Camp	WTP	WTP	WTS	WRSF Runoff	WRSF Pond	WRSF Pond	WT Pit	WT Pit (Phase 1 Ramp)	Sump 6	Runoff Road 7	Road 7 Runoff
			IVR Attn. Pond	Freshwater Usage	WT Attn. Pond	WTS (Temp. + Perm. Diffusers)	MM Lake (East + West Diffusers)	MM Lake (SWTCH)	WRSF Pond	WT Attn. Pond	IVR Attn Pond	WT Attn. Pond	MM D/S	IVR Attn Pond	IVR Attn Pond	WT Attn. Pond
Q1	January-25	31	108	3,832	2,418	100,000	0	0		0	0	0		0	0	
	February-25	28	0	3,832	2,418	100,000	0	0		0	0	0		0	0	
	March-25	31	0	3,832	2,418	150,000	0	0		0	0	0		0	0	
Q2	April-25	30	11	3,832	2,418	150,000	0	0		0	0	0		0	0	
	May-25	31	477	3,832	2,418	150,000	0	0		0	0	0		0	0	
	June-25	30	412	3,832	2,418	288,000	288,000	750,000	10,000	0	60,000	0	30,000	0	15,135	
Q3	July-25	31	32,467	3,832	2,418	0	350,000	750,000	9,000	0	25,000	0		0	1,520	
	August-25	31	3,631	3,832	2,418	0	300,000	300,000	4,000	0	15,000	0		0	2,563	
	September-25	30	6,123	3,832	2,418	0	200,000	300,000	3,500	0	15,000	0		0	7,594	
Q4	October-25	31	18,141	3,832	2,418	108,000	108,000	200,000		0	0	0		0	0	
	November-25	30	1,891	3,832	2,418	100,000	0	50,000		0	0	0		0	0	
	December-25	31	789	3,832	2,418	100,000	0	0		0	0	0		0	0	
2025 AVERAGES & TOTALS			64,049	45,984	29,016	1,246,000	1,246,000	2,350,000	26,500	0	115,000	0	30,000	0	26,812	0
Q1	January-26	31	108	3,832	2,418	100,000	0	0		0	0	0		0	0	
	February-26	28	0	3,832	2,418	100,000	0	0		0	0	0		0	0	
	March-26	31	0	3,832	2,418	150,000	0	0		0	0	0		0	0	
Q2	April-26	30	11	3,832	2,418	150,000	0	0		0	0	0		0	0	
	May-26	31	477	3,832	2,418	150,000	0	0		0	0	0		0	0	
	June-26	30	412	3,832	2,418	288,000	288,000	750,000	10,000	0	60,000	0	30,000	0	15,135	
Q3	July-26	31	32,467	3,832	2,418			750,000		0	0	0		0		
	August-26	31	3,631	3,832	2,418			300,000		0	0	0		0		
	September-26	30	6,123	3,832	2,418			300,000		0	0	0		0		
Q4	October-26	31	18,141	3,832	2,418			200,000		0	0	0		0		
	November-26	30	1,891	3,832	2,418			50,000		0	0	0		0		
	December-26	31	789	3,832	2,418			0		0	0	0		0		
2026 AVERAGES & TOTALS			64,049	45,984	29,016	938,000	288,000	2,350,000	10,000	0	60,000	0	30,000	0	15,135	0
Q1	January-27	31	108	3,832	2,418	0	0	0		0	0	0		0	0	
	February-27	28	0	3,832	2,418	0	0	0		0	0	0		0	0	
	March-27	31	0	3,832	2,418	0	0	0		0	0	0		0	0	
Q2	April-27	30	11	3,832	2,418	0	0	0		0	0	0		0	0	
	May-27	31	477	3,832	2,418	0	0	0		0	0	0		0	0	
	June-27	30	412	3,832	2,418	0	0	0		0	0	0		0	0	
Q3	July-27	31	32,467	3,832	2,418	0	0	0		0	0	0		0	0	
	August-27	31	3,631	3,832	2,418	0	0	0		0	0	0		0	0	
	September-27	30	6,123	3,832	2,418	0	0	0		0	0	0		0	0	
Q4	October-27	31	18,141	3,832	2,418	0	0	0		0	0	0		0	0	
	November-27	30	1,891	3,832	2,418	0	0	0		0	0	0		0	0	
	December-27	31	789	3,832	2,418	0	0	0		0	0	0		0	0	
2027 AVERAGES & TOTALS			64,049	45,984	29,016	0	0	0	0	0	0	0	0	0	0	0

	Month	Nbr days														
			Estimated Runoff	Nemo (HMI)	Camp	WTP	WTP	WTS	WRSF Runoff	WRSF Pond	WRSF Pond	WT Pit	WT Pit (Phase 1 Ramp)	Sump 6	Runoff Road 7	Road 7 Runoff
			IVR Attn. Pond	Freshwater Usage	WT Attn. Pond	WTS (Temp. + Perm. Diffusers)	MM Lake (East + West Diffusers)	MM Lake (SWTCH)	WRSF Pond	WT Attn. Pond	IVR Attn Pond	WT Attn. Pond	MM D/S	IVR Attn Pond	IVR Attn Pond	WT Attn. Pond
Q1	January-28	31	108		2,418	0	0	0		0	0	0		0	0	
	February-28	29	0		2,418	0	0	0		0	0	0		0	0	
	March-28	31	0		2,418	0	0	0		0	0	0		0	0	
Q2	April-28	30	11		2,418	0	0	0		0	0	0		0	0	
	May-28	31	477		2,418	0	0	0		0	0	0		0	0	
	June-28	30	412		2,418	0	0	0		0	0	0		0	0	
Q3	July-28	31	32,467		2,418	0	0	0		0	0	0		0	0	
	August-28	31	3,631		2,418	0	0	0		0	0	0		0	0	
	September-28	30	6,123		2,418	0	0	0		0	0	0		0	0	
Q4	October-28	31	18,141		2,418	0	0	0		0	0	0		0	0	
	November-28	30	1,891		2,418	0	0	0		0	0	0		0	0	
	December-28	31	789		2,418	0	0	0		0	0	0		0	0	
2028 AVERAGES & TOTALS			64,049	0	29,016	0	0	0	0	0	0	0	0	0	0	0

	Month	Nbr days														W	
			MM D/S	Q1	WT Attn Pond	IVR Pit	WT Pit	IWA	IWB	IWC	IWD	UG Portal	AP5 / GSP1	AP5 / GSP1	Mammoth D/S	Inflow volume (m3)	Discharg fo
			WT Attn. Pond	WT Attn. Pond	IVR Attn Pond	IVR Attn Pond	IVR Attn Pond	IVR Attn Pond	IVR Attn Pond	IVR Attn Pond	IVR Attn Pond	AP5 / GSP1	UG (for Brine)	GSP2	IVR Attn. Pond		WTS
Q1	January-22	31	0	0	111,509	0	0	0	0	0	0	0	0		0	84,832	0
	February-22	28	0	0	78,750	0	0	0	0	0	0	0	0		0	37,109	0
	March-22	31	0	0	0	0	0	0	0	0	0	0	0		0	29,336	0
Q2	April-22	30	0	0	153,346	0	0	0	0	0	0	0	0		0	123,552	0
	May-22	31	0	0	158,016	0	0	0	3,293	0	0	0	0		6,991	41,261	0
	June-22	30	0	0	313,114	0	0	4,144	16,752	0	0	832	0		12,980	217,566	0
Q3	July-22	31	0	0	186,018	0	0	0	8,678	0	3,032	859	0		5,432	138,559	0
	August-22	31	0	0	179,427	0	0	0	1,600	0	0	859	0		10,266	91,182	0
	September-22	30	0	0	264,917	0	0	1,694	11,036	2,535	0	0	0		7,048	120,299	0
Q4	October-22	31	0	0	168,164	0	0	0	498	0	0	0	0		1,330	149,722	0
	November-22	30	0	0	90,083	0	0	0	0	0	0	0	0		0	79,200	0
	December-22	31			46,065	0	0	0	0	0	0	0	0		0	62,088	0
2022 AVERAGES & TOTALS			0	0	1,749,409	0	0	5,838	41,857	2,535	3,032	2,550	0	0	44,047	1,174,706	
Q1	January-23	31			151,472	0	62,721	0	0	0	0	0	0		0	159,857	0
	February-23	28			100,000	0	43,703	0	0	0	0	0	0		0	77,280	0
	March-23	31			100,000	0	71,320	0	0	0	0	0	0		0	85,560	0
Q2	April-23	30			80,000	0	48,680	0	0	0	0	0	0		0	82,800	0
	May-23	31			80,000	0	54,592	0	0	0	0	0	1,368		0	85,560	0
	June-23	30		10,000	250,000	49,849	139,292	2,754	11,340	5,786	0	850	1,323		10,000	82,800	0
Q3	July-23	31			120,000	5,095	100,189	277	1,139	581	0	850	1,368		20,000	85,560	0
	August-23	31			100,000	9,434	103,952	466	1,920	980	0	850	1,368		15,000	85,560	0
	September-23	30			100,000	25,008	118,492	1,382	5,690	2,903	0	0	1,323		0	82,800	0
Q4	October-23	31			60,000	0	54,546	0	0	0	0	0	1,368		0	85,560	0
	November-23	30			60,000	0	60,286	0	0	0	0	0	0		0	82,800	0
	December-23	31			60,000	0	53,053	0	0	0	0	0	0		0	85,560	0
2023 AVERAGES & TOTALS			0	10,000	1,261,472	89,386	910,826	4,879	20,089	10,249	0	2,550	8,117	0	45,000	1,081,697	
Q1	January-24	31			100,000	0	62,721	0	0	0		0	0		0	85,560	0
	February-24	29			100,000	0	43,703	0	0	0		0	0		0	80,040	0
	March-24	31			100,000	0	71,320	0	0	0		0	0		0	85,560	0
Q2	April-24	30			80,000	0	48,680	0	0	0		0	0		0	82,800	0
	May-24	31			80,000	0	54,592	0	0	0		0	1,551		0	85,560	0
	June-24	30		10,000	250,000	49,849	139,292	2,754	11,340	5,786		850	1,501		10,000	82,800	0
Q3	July-24	31			120,000	5,095	100,189	277	1,139	581		850	1,551		20,000	85,560	0
	August-24	31			100,000	9,434	103,952	466	1,920	980		850	1,551		15,000	85,560	0
	September-24	30			100,000	25,008	118,492	1,382	5,690	2,903		0	1,501		0	82,800	0
Q4	October-24	31			60,000	0	54,546	0	0	0		0	1,551		0	85,560	0
	November-24	30			60,000	0	60,286	0	0	0		0	0		0	82,800	0
	December-24	31			60,000	0	53,053	0	0	0		0	0		0	85,560	0
2024 AVERAGES & TOTALS			0	10,000	1,210,000	89,386	910,826	4,879	20,089	10,249	0	2,550	9,205	0	45,000	1,010,160	

	Month	Nbr days														W	
			MM D/S	Q1	WT Attn Pond	IVR Pit	WT Pit	IWA	IWB	IWC	IWD	UG Portal	AP5 / GSP1	AP5 / GSP1	Mammoth D/S	Inflow volume (m3)	Discharge fo
			WT Attn. Pond	WT Attn. Pond	IVR Attn Pond	IVR Attn Pond	IVR Attn Pond	IVR Attn Pond	IVR Attn Pond	IVR Attn Pond	IVR Attn Pond	AP5 / GSP1	UG (for Brine)	GSP2	IVR Attn. Pond		WTS
Q1	January-25	31			100,000	0	62,721	0	0	0		0	0		0	85,560	0
	February-25	28			100,000	0	43,703	0	0	0		0	0		0	77,280	0
	March-25	31			100,000	0	71,320	0	0	0		0	0		0	85,560	0
Q2	April-25	30			80,000	0	48,680	0	0	0		0	0		0	82,800	0
	May-25	31			80,000	0	54,592	0	0	0		0	0		0	85,560	0
	June-25	30		10,000	250,000	49,849	139,292	2,754	11,340	5,786		850	0		10,000	82,800	0
Q3	July-25	31			120,000	5,095	100,189	277	1,139	581		850	0		20,000	85,560	0
	August-25	31			100,000	9,434	103,952	466	1,920	980		850	0		15,000	85,560	0
	September-25	30			100,000	25,008	118,492	1,382	5,690	2,903		0	0		0	82,800	0
Q4	October-25	31			60,000	0	54,546	0	0	0		0	0		0	85,560	0
	November-25	30			60,000	0	60,286	0	0	0		0	0		0	82,800	0
	December-25	31			60,000	0	53,053	0	0	0		0	0		0	85,560	0
2025 AVERAGES & TOTALS			0	10,000	1,210,000	89,386	910,826	4,879	20,089	10,249	0	2,550	0	0	45,000	1,007,400	
Q1	January-26	31			100,000	0	62,721	0	0	0		0	0		0	85,560	0
	February-26	28			100,000	0	43,703	0	0	0		0	0		0	77,280	0
	March-26	31			100,000	0	71,320	0	0	0		0	0		0	85,560	0
Q2	April-26	30			80,000	0	48,680	0	0	0		0	0		0	82,800	0
	May-26	31			80,000	0	54,592	0	0	0		0	0		0	85,560	0
	June-26	30		10,000	250,000	49,849	139,292	2,754	11,340	5,786		850	0		10,000	82,800	0
Q3	July-26	31										850	0		0	85,560	0
	August-26	31										850	0		0	85,560	0
	September-26	30										0	0		0	82,800	0
Q4	October-26	31										0	0		0	85,560	0
	November-26	30										0	0		0	82,800	0
	December-26	31										0	0		0	85,560	0
2026 AVERAGES & TOTALS			0	10,000	710,000	49,849	420,308	2,754	11,340	5,786	0	2,550	0	0	10,000	1,007,400	
Q1	January-27	31			0	0	0					0	0	0		85,560	0
	February-27	28			0	0	0					0	0	0		77,280	0
	March-27	31			0	0	0					0	0	0		85,560	0
Q2	April-27	30			0	0	0					0	0	0		82,800	0
	May-27	31			0	0	0					0	0	0		85,560	0
	June-27	30			0	0	0					850	0	0		82,800	0
Q3	July-27	31			0	0	0					850	0	0		85,560	0
	August-27	31			0	0	0					850	0	0		85,560	0
	September-27	30			0	0	0					0	0	0		82,800	0
Q4	October-27	31			0	0	0					0	0	0		85,560	0
	November-27	30			0	0	0					0	0	0		82,800	0
	December-27	31			0	0	0					0	0	0		85,560	0
2027 AVERAGES & TOTALS			0	0	0	0	0	0	0	0	0	2,550	0	0	0	1,007,400	

	Month	Nbr days														W	
			MM D/S	Q1	WT Attn Pond	IVR Pit	WT Pit	IWA	IWB	IWC	IWD	UG Portal	AP5 / GSP1	AP5 / GSP1	Mammoth D/S	Inflow volume (m3)	Discharg fo
			WT Attn. Pond	WT Attn. Pond	IVR Attn Pond	IVR Attn Pond	IVR Attn Pond	IVR Attn Pond	IVR Attn Pond	IVR Attn Pond	IVR Attn Pond	AP5 / GSP1	UG (for Brine)	GSP2	IVR Attn. Pond		WTS
Q1	January-28	31			0	0	0					0		0		108,000	0
	February-28	29			0	0	0					0		0		108,000	0
	March-28	31			0	0	0					0		0		108,000	0
Q2	April-28	30			0	0	0					0		0		108,000	0
	May-28	31			0	0	0					0		0		108,000	0
	June-28	30			0	0	0					0		0		108,000	0
Q3	July-28	31			0	0	0					0		0		108,000	0
	August-28	31			0	0	0					0		0		108,000	0
	September-28	30			0	0	0					0		0		108,000	0
Q4	October-28	31			0	0	0					0		0		108,000	0
	November-28	30			0	0	0					0		0		108,000	0
	December-28	31			0	0	0					0		0		108,000	0
2028 AVERAGES & TOTALS			0	0	0	0	0	0	0	0	0	0	0	0	0	1,296,000	

	Month	Nbr days	TD Seepage	
			Location: Enter 1 or destination	Volume pumped to WTS
			WTN attn. pond	
Q1	January-22	31	1	0
	February-22	28	1	0
	March-22	31	1	0
Q2	April-22	30	1	0
	May-22	31	1	0
	June-22	30	1	0
Q3	July-22	31	1	0
	August-22	31	1	0
	September-22	30	1	0
Q4	October-22	31	1	0
	November-22	30	1	0
	December-22	31	1	0
2022 AVERAGES & TOTALS				0
Q1	January-23	31	1	0
	February-23	28	1	0
	March-23	31	1	0
Q2	April-23	30	1	0
	May-23	31	1	0
	June-23	30	1	0
Q3	July-23	31	1	0
	August-23	31	1	0
	September-23	30	1	0
Q4	October-23	31	1	0
	November-23	30	1	0
	December-23	31	1	0
2023 AVERAGES & TOTALS				0
Q1	January-24	31	1	0
	February-24	29	1	0
	March-24	31	1	0
Q2	April-24	30	1	0
	May-24	31	1	0
	June-24	30	1	0
Q3	July-24	31	1	0
	August-24	31	1	0
	September-24	30	1	0
Q4	October-24	31	1	0
	November-24	30	1	0
	December-24	31	1	0
2024 AVERAGES & TOTALS				0




	Month	Nbr days	TD Seepage	
			Seepage location: Enter 1 or destination	Volume pumped to WTS
			WTN attn. pond	
Q1	January-25	31	1	0
	February-25	28	1	0
	March-25	31	1	0
Q2	April-25	30	1	0
	May-25	31	1	0
	June-25	30	1	0
Q3	July-25	31	1	0
	August-25	31	1	0
	September-25	30	1	0
Q4	October-25	31	1	0
	November-25	30	1	0
	December-25	31	1	0
2025 AVERAGES & TOTALS				0
Q1	January-26	31	1	0
	February-26	28	1	0
	March-26	31	1	0
Q2	April-26	30	1	0
	May-26	31	1	0
	June-26	30	1	0
Q3	July-26	31	1	0
	August-26	31	1	0
	September-26	30	1	0
Q4	October-26	31	1	0
	November-26	30	1	0
	December-26	31	1	0
2026 AVERAGES & TOTALS				0
Q1	January-27	31	1	0
	February-27	28	1	0
	March-27	31	1	0
Q2	April-27	30	1	0
	May-27	31	1	0
	June-27	30	1	0
Q3	July-27	31	1	0
	August-27	31	1	0
	September-27	30	1	0
Q4	October-27	31	1	0
	November-27	30	1	0
	December-27	31	1	0
2027 AVERAGES & TOTALS				0

	Month	Nbr days	TD Seepage	
			Seepage location: Enter 1 for destination	Volume pumped to WTS
			WTN attn. pond	
Q1	January-28	31	1	0
	February-28	29	1	0
	March-28	31	1	0
Q2	April-28	30	1	0
	May-28	31	1	0
	June-28	30	1	0
Q3	July-28	31	1	0
	August-28	31	1	0
	September-28	30	1	0
Q4	October-28	31	1	0
	November-28	30	1	0
	December-28	31	1	0
2028 AVERAGES & TOTALS				0

**APPENDIX D • 2022 WHALE TAIL WATER QUALITY FORECAST UPDATE**

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Title of  
document:

**Water Quality Forecast Update Based on 2022 WMP for Whale Tail Mine**

Client:

**AGNICO EAGLE MINES**

Project:

**2022 ANNUAL REPORT FOR WHALE TAIL MINE  
WATER BALANCE AND QUALITY FORECAST**

*Prepared by:*

Ikram Elkhousmi, ing., M.Sc.A.  
Professional in Mining Environment




*Reviewed by:*

Anh-Long Nguyen, Eng., M. Sc.  
#OIQ: 122858, #NAPEG: L2716

*Approved by:*

Anh-Long Nguyen, Eng., M. Sc.  
#OIQ: 122858, #NAPEG: L2716

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Revision					Pages Revised	Remarks
#	Prep.	Rev.	App.	Date		
PA	IE	ALN	ALN	Feb. 27, 2023		Issue for internal comments
PB	IE	ALN	ALN	Feb. 28, 2023		Issue for client's comments
00	IE	ALN	ALN	Mar. 15, 2023		Final

## NOTICE TO READER

This document contains the expression of the professional opinion of SNC-Lavalin Inc. ("SNC-Lavalin") as to the matters set out herein, using its professional judgment and reasonable care. It is to be read in the context of the agreement dated December 8, 2022 (the "Agreement") between SNC-Lavalin and Agnico Eagle Mines (the "Client") and the methodology, procedures and techniques used, SNC-Lavalin's assumptions, and the circumstances and constraints under which its mandate was performed. This document is written solely for the purpose stated in the Agreement, and for the sole and exclusive benefit of the Client, whose remedies are limited to those set out in the Agreement. This document is meant to be read as a whole, and sections or parts thereof should thus not be read or relied upon out of context.

SNC-Lavalin has, in preparing estimates, as the case may be, followed accepted methodology and procedures, and exercised due care consistent with the intended level of accuracy, using its professional judgment and reasonable care, and is thus of the opinion that there is a high probability that actual values will be consistent with the estimate(s). Unless expressly stated otherwise, assumptions, data and information supplied by, or gathered from other sources (including the Client, other consultants, testing laboratories and equipment suppliers, etc.) upon which SNC-Lavalin's opinion as set out herein are based have not been verified by SNC-Lavalin; SNC-Lavalin makes no representation as to its accuracy and disclaims all liability with respect thereto.

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## 1.0 Introduction

### 1.1 Context


Agnico Eagle Mines (AEM) is operating the Meadowbank Mine site and its satellite deposit Whale Tail Mine. Presently, all contact water from the Whale Tail site is pumped or directed toward the Whale Tail (WT) and IVR Attenuation Ponds. From there, it is treated at the Water Treatment Plant (WTP) and discharged to either Whale Tail South (WTS) Lake or Mammoth Lake. At closure, the IVR Attenuation Pond will be backfilled and the WT Attenuation Pond and the WT and IVR pits will be allowed to refill through active transfer of water from WTS Lake and natural runoff.

### 1.2 Mandate

SNC-Lavalin Inc (SNC-Lavalin) was mandated by Agnico Eagle (Agnico) to review the water balance and update the water quality forecasting model yearly during operation phase, closure and post-closure.

SNC-Lavalin was mandated to:

- > Review water quality data measured in 2022 and compile data with previous field measurements to update the water quality forecast model.
- > Review the AEM 2022 Water Balance (WB) developed for the 2022 Water Management Plan (WMP) for the Whale Tail Mine.
- > Forecast of the water quality in terms of the concentration of selected parameters of concern (defined in previous studies as passing the discharge criteria outlined in the water license 2A M-WTP1830) within WT and IVR Attenuation Ponds and WTS and Mammoth Lakes during operation, closure and post-closure using AEM 2022 WB.
- > Produce a technical note for the Whale Tail Water Quality Forecast Update based on the 2022 WMP for the Whale Tail Mine.

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## 2.0 Review of Water Balance and Water Quality Database

### 2.1 Documents Reviewed

A review of the AEM 2022 Water Balance (WB) and the available water quality data measured in 2022 was undertaken by SNC-Lavalin and compiled with previous data measured since 2020. This includes a review of the following documents:

- > The 2022 Water balance model provided by AEM;
- > Water quality data results provided by AEM.

A compilation of the measured water quality data sampled at the Whale Tail Mine site in 2022 was performed by SNC-Lavalin for the following sectors:

- > WT Attenuation Pond (sampling point ST-WT-1);
- > IVR Attenuation Pond (sampling point ST-WT-23);
- > IVR Pit-Sump (sampling point ST-WT-18);
- > Mammoth Lake (sampling point MAME-2);
- > Whale Tail dike Seepage (sampling point ST-WT-17);
- > WRSF Pond (sampling point ST-WT-3);
- > Whale Tail Pit Sump (sampling point ST-WT-4);
- > WTS Lake (sampling point WTSE).

The measured water quality of 2022 was added to measured data conducted at the WT site between 2019 and 2021 and used as a database for the updated Water Quality Forecast (WQF) model. The following reference documents were consulted:

- > WB-WQF original model developed by SNC-Lavalin (SNC 2021);
- > WB for operation for 2021 (AEM, 2022a);

Some previous analysis reports have been consulted mainly:

- > Whale Tail 2021 Annual report by Golder (Golder, 2022).

It is important to remember that the review of the Whale Tail water quality data was undertaken to provide a basis for the development and update of the water quality forecast mass balance model.


## 2.2 Water Balance

### 2.2.1 Water Management Phases

The Water Balance 2022 (WB 2022) was developed by AEM (AEM 2022a) and is based on the current and future water management plan (WMP). The water balance examined the water transfers required for the water management infrastructure during the active life of Mine (LOM), the closure and post-closure phases under average hydrologic conditions.

The WB is updated on a yearly basis based on actual water transfers conducted on site, field survey of the different pond levels and on updates to the LOM and the planned closure and post-closure phases.

The WB 2022 integrates the planned streams of water within the Whale Tail Mine site including all inflows and outflows to and from the IVR Attenuation Pond, WT Attenuation Pond, Mammoth Lake and WTS Lake.

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The WB 2022 was based on the revised mining schedule presented in [Table 2-1](#) for the Whale Tail Mine.

**Table 2-1: Water Management Phases (based on Whale Tail Mine 2022 Waste Management Plan)**

ACTIVITY	START DATE <sup>1</sup>	END DATE <sup>1</sup>
<b>Pits Mining</b>		
Whale Tail Pit	July 2019	December 2025
IVR Pit	July 2021	December 2025
<b>Rock Storage Facility (RSF) Operations</b>		
Whale Tail RSF	July 2019	December 2025
IVR RSF	July 2021	December 2025
<b>Attenuation / Reclaim Pond Water Management</b>		
Whale Tail Attenuation Pond	July 2019	December 2025
IVR Attenuation Pond	May 2021	December 2025
<b>Other Key Activities</b>		
Dewatering of Whale Tail North Basin (future WT Pit and WT Attenuation Pond)	March 2019	June 2020
Dewatering of Lake A53 (future IVR Attenuation Pond)	June 2020	September 2020
Closure Period	January 2026	December 2044
Active Flooding of Whale Tail Pit and IVR Pit	July 2026	June 2043
Breaching of dikes <sup>2</sup>	n/a	January 2045 only if water criteria are met
Post-Closure Period <sup>3,4</sup>	January 2045	December 2049

**Notes:**

1. Periods are given from the beginning of the starting month to the end of the ending month.
2. Tentative dates.
3. A five year long post-closure period was selected for modelling purposes, taking a conservative approach.
4. It is noted that the post-closure period begins when the dikes are breached; dike breach can only take place once upstream and downstream of the dikes reaches the same elevation. The dike breach can only take place once water quality in all three water bodies meets water quality criteria. The closure schedule for the overall Project is based on the preliminary closure methods and strategies discussed in the Whale Tail ICRP. It is anticipated that the schedule will be refined throughout the project life as the designs are advanced, and the closure methods and strategies are further developed.

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### 2.2.2 Treated Water Volumes

During operation, all contact water on the Whale Tail Mine site is collected and transferred to the WT and IVR Attenuation Ponds. It is then treated at the Water Treatment Plant (WTP) and discharged to WTS or Mammoth Lakes. **Table 2-2** provides a summary of the treated volumes of water since 2020.

**Table 2-2: Summary of Treated Volume since 2020**

Year	Treated Water to Mammoth Lake (m <sup>3</sup> / year)	Treated Water to WTS (m <sup>3</sup> / year)	Total Volume of Treated Water (m <sup>3</sup> / year)
2020	1 705 519	1 495 274	3 200 793
2021	1 427 352	1 261 391	2 688 743
2022	872 789	1 115 287	1 988 076

### 2.2.3 Pit Re-Flooding

At closure, the WT and IVR pits shall be re-flooded by active transfer of water from the WTS Lake and by natural runoff flowing from the Whale Tail Mine site to the pits. Once the IVR Pit is flooded, it overflows toward WT Pit. Once WT Pit is flooded, it overflows into WT Attenuation Pond and forms the Whale Tail North (WTN) Basin.


**Table 2-3** provides a summary of the volumes of water that is planned to be transferred from WTS Lake to the pits.

Based on AEM WB 2022, it is forecasted that the IVR Pit will be flooded by 2027 while the WT Pit / WTN Basin will reach a water elevation of approximately 153.5 m in 2044.

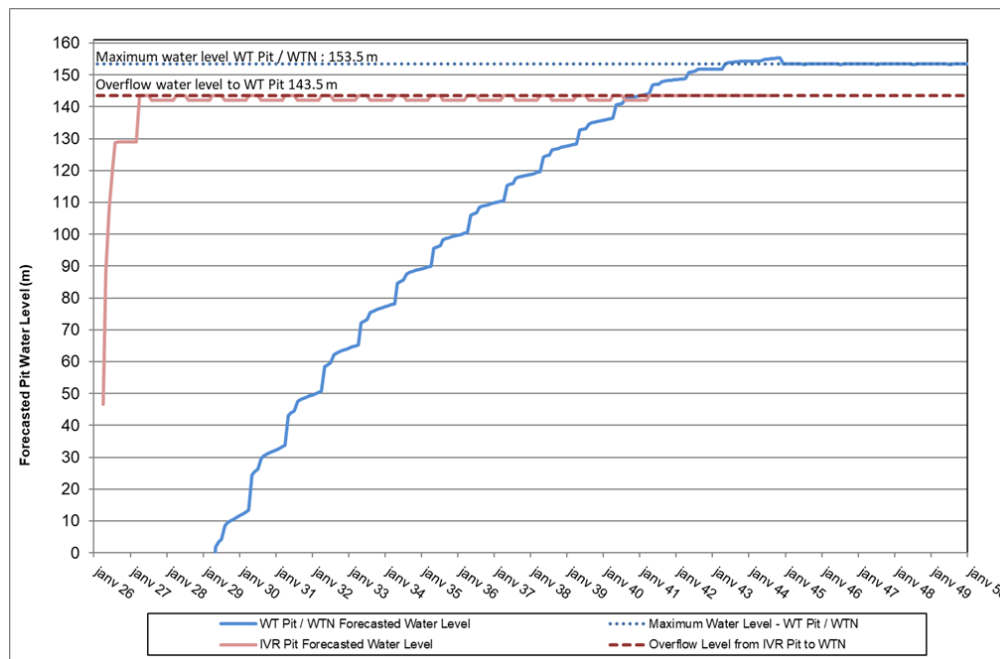
**Figure 2-1** provides the forecasted water elevation in WT and IVR pits at closure and post-closure.

**Table 2-3: Forecasted Pit Re-Flooding Volumes**

Year	Pit Reflooding Volume from WTS Lake to IVR and WT Pits (m <sup>3</sup> / year)	Year	Pit Reflooding Volume from WTS Lake to IVR and WT Pits (m <sup>3</sup> / year)
2026	5 580 000	2036	2 887 260
2027	2 887 260	2037	2 887 260
2028	2 887 260	2038	2 887 260
2029	2 887 260	2039	2 887 260
2030	2 887 260	2040	2 887 260
2031	2 887 260	2041	2 887 260
2032	2 887 260	2042	2 887 260
2033	2 887 260	2043	2 080 471
2034	2 887 260	2044	0
2035	2 887 260	<b>TOTAL</b>	<b>53 856 637</b>

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**Figure 2-1: Forecasted Water Elevation in WT Pit / WTN Basin and IVR Pit**



## 2.3 Site Water Quality


In 2022, contact water collected from the Whale Tail Mine site, including the WT and IVR Waste Rock Storage Facilities (WRSF) and the WT and IVR pits, were transferred to the WT and IVR Attenuation Ponds and treated at the WTP.

**Table 2-4** summarizes the quality of water sampled at the Attenuation Ponds (WT Attenuation Pond and IVR Attenuation Pond) and the treated water discharged at either Mammoth Lake or WTS Lake. The average and maximum total concentrations for key constituents that have a specific discharge criterion in the Water License 2AM-WTP1830, or a specific CCME (Canadian Council of ministers of the Environment) guideline is presented in **Table 2-4**. It is important to note that the CCME guidelines are not discharge criteria but rather receiving environment guidelines only.

For total Aluminium (Al), the FWQG (Federal Water Quality Guideline, 2022) was adopted for comparison rather than CCME. The FWQG for total aluminium is calculated following this equation where average values of DOC, hardness and pH at Mammoth Lake were taking in the calculation for total Aluminium:

$$FWQG (\mu g) = \exp ([0.645 * \ln(DOC)] + [2.255 * \ln(hardness)] + [1.995 * pH] + [-0.284 * (\ln(hardness) * pH)]) - 9.898$$

Parameter	Unit	Average value
DOC	mg/L	0.08
Hardness	mg/L	58
pH	-	7
FWQG for Al	mg/L	0.035

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For measured values that were below the detection limit, a value equal to half of the detection limit was considered in the analysis. Values bolded and underlined and highlighted in grey indicated values above the Water Licence criteria. Cells highlighted in green indicate values higher than the CCME guidelines for Protection of Aquatic Life, which are used for comparison purpose only.

Per the data presented in [Table 2-4](#), the following constituents measured in WT and IVR Attenuation Ponds were above the Water Licence discharge criteria:

- > Total Suspended Solids (TSS);
- > Total Aluminum (Al);
- > Total Arsenic (As);
- > Total Chromium (Cr), only maximum value;
- > Total Iron (Fe);
- > Dissolved Arsenic (As).


When comparing the measured values in both Mammoth Lake and WTS Lake to the Water Licence and CCME guidelines, no parameter presents a concentration above these guidelines.

## 2.4 Treated Water Quality

The treated effluent discharge to the WTS and Mammoth Lakes met consistently the Water Licence discharge criteria, except for one (1) sample where the total and dissolved arsenic (As) maximum value was above the Water Licence criterion ([Table 2-4](#)). Note that this value was reported to the Regulators and appropriate correction actions were applied. The cause of this higher value could be the result of a drop in treatment performance


When comparing the measured values sampled in the treated effluent to the CCME guidelines for comparison purpose only, all of the constituents were on average below CCME guidelines, with the exception of arsenic. There were some samples with a maximum measured concentration that was above the CCME guidelines, specifically:

- > In the treated effluent to Mammoth Lake: Arsenic and Iron;
- > In the treated effluent to WTS Lake: Nitrate, Arsenic, Copper, Iron, and Nickel.
- > In the treated effluent to WTS Lake: Al maximum measured concentration exceeds slightly the FWQG criterion.

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**Table 2-4: Yearly Average and Maximum Concentrations Measured at Whale Tail Mine for 2022**


Parameters	Units	Water Licence 2AM-WTP1830		CCME Guidelines / FWQG-AI	Whale Tail Attenuation Pond (ST-WT-1)		IVR Attenuation Pond (ST-WT-23)		Treated Effluent to Mammoth Lake (WT-2)		Treated Effluent to WTSL (WT-24)		Mammoth Lake (MAME-2)		Whale Tail South Lake (WTSE)	
		Monthly Average	Maximum Allowable Conc.		Yearly Avg.	Max. Value	Yearly Avg.	Max. Value	Yearly Avg.	Max. Value	Yearly Avg.	Max. Value	Yearly Avg.	Max. Value	Yearly Avg.	Max. Value
Alkalinity	mg CaCO <sub>3</sub> /L	n/a	n/a	n/a	11	49	56	96	39	48	56	87	21	26	19	22
Hardness	mg CaCO <sub>3</sub> /L	n/a	n/a	n/a	126	191	162	255	137	251	163	240	58	73	42	46
pH		<b>6.0 to 9.5</b>	<b>6.0 to 9.5</b>	6.0 to 9.5	7.1	7.8	7.1	9.8	7.0	7.4	7.0	7.6	7.0	7.8	7.2	7.9
Temperature	deg. C	n/a	n/a	n/a	6	9	5	16	8	13	1	5	7	15	7	17
Total Ammonia (NH <sub>3</sub> + NH <sub>4</sub> )	mg N/L	<b>16</b>	<b>32</b>	12.6	1.1	2.7	0.8	2.9	0.4	1.1	1.0	3.0	0.0	0.1	0.1	0.1
Un-ionized ammonia (as N)	mg N/L	n/a	n/a	n/a	0.9171	0.0233	0.0014	0.0120	n/a	n/a	n/a	n/a	0.0001	0.0002	0.0001	0.0001
Nitrate (NO <sub>3</sub> )	mgN/L	n/a	n/a	2.93	2.37	9.53	3.19	5.41	0.49	1.30	1.18	3.60	0.36	0.74	0.42	0.55
Chloride	mg/L	n/a	n/a	120	30	46	51	100	43	100	51	81	18	24	16	16
Fluoride	mg/L	n/a	n/a	0.12	0.13	0.20	0.16	0.29	n/a	n/a	n/a	n/a	0.06	0.07	n/a	n/a
Sulphate	mg/L	n/a	n/a	128	60	110	61	120	63	110	66	110	19	26	15	15
TSS	mg/L	<b>15</b>	<b>30</b>	n/a	<b>41</b>	<b>308</b>	<b>26</b>	<b>130</b>	2	6	2	5	1	1	1	2
TDS	mg/L	<b>1400</b>	<b>1400</b>	n/a	195	375	272	495	233	445	274	440	106	133	78	105
Total Phosphorus (P)	mg/L	<b>0.3</b>	<b>0.6</b>	0.01	0.05	0.48	0.04	0.19	0.00	0.01	0.00	0.01	0.01	0.02	0.00	0.03
Total Aluminium (Al)	mg/L	<b>0.5</b>	<b>1</b>	0.035	<b>0.8</b>	<b>5.5</b>	0.49	<b>3.1</b>	0.01	0.01	0.01	0.055	0.007	0.01	0.008	0.009
Total Arsenic (As)	mg/L	<b>0.1</b>	<b>0.2</b>	0.025	<b>0.189</b>	<b>0.213</b>	<b>0.232</b>	<b>1.820</b>	0.010	0.041	0.056	<b>0.437</b>	0.001	0.002	0.001	0.002
Total Barium (Ba)	mg/L	n/a	n/a	n/a	0.053	0.156	0.071	0.129	0.052	0.081	0.065	0.099	0.023	0.034	n/a	n/a
Total Cadmium (Cd)	mg/L	<b>0.002</b>	<b>0.004</b>	0.00011	0.00003	0.00011	0.00003	0.00007	0.00001	0.00002	0.00001	0.00003	0.00001	0.00003	0.00001	0.00002
Total Calcium (Ca)	mg/L	n/a	n/a	n/a	22.2	47.3	54.9	69.4	39.1	73.0	46.9	70.7	16.3	20.8	8.3	8.3
Total Chromium (Cr)	mg/L	<b>0.02</b>	<b>0.04</b>	0.001	0.008	<b>0.061</b>	0.008	<b>0.051</b>	0.001	0.001	0.001	0.001	0.0005	0.001	0.0003	0.001
Total Copper (Cu)	mg/L	<b>0.1</b>	<b>0.2</b>	0.002	0.003	0.017	0.003	0.012	0.001	0.001	0.002	0.005	0.001	0.002	0.001	0.001
Total Iron (Fe)	mg/L	<b>1</b>	<b>2</b>	0.3	<b>1.9</b>	<b>16.4</b>	<b>1.1</b>	<b>6.4</b>	0.3	0.7	0.3	1.0	0.0	0.0	0.1	0.1
Total Lead (Pb)	mg/L	<b>0.05</b>	<b>0.1</b>	0.0017	0.0013	0.0073	0.0012	0.0087	0.0002	0.0002	0.0002	0.0003	0.0001	0.0002	0.0001	0.0002

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Parameters	Units	Water Licence 2AM-WTP1830		CCME Guidelines / FWQG-AI	Whale Tail Attenuation Pond (ST-WT-1)		IVR Attenuation Pond (ST-WT-23)		Treated Effluent to Mammoth Lake (WT-2)		Treated Effluent to WTSL (WT-24)		Mammoth Lake (MAME-2)		Whale Tail South Lake (WTSE)	
		Monthly Average	Maximum Allowable Conc.		Yearly Avg.	Max. Value	Yearly Avg.	Max. Value	Yearly Avg.	Max. Value	Yearly Avg.	Max. Value	Yearly Avg.	Max. Value	Yearly Avg.	Max. Value
Total Magnesium (Mg)	mg/L	n/a	n/a	n/a	9.1	17.8	11.4	17.1	9.5	16.8	11.2	16.1	4.2	5.3	2.8	2.8
Total Manganese (Mn)	mg/L	n/a	n/a	0.49	0.30	1.50	0.23	0.49	0.18	0.33	0.29	0.44	0.01	0.01	0.02	0.03
Total Mercury (Hg)	mg/L	<u>0.004</u>	<u>0.008</u>	0.000026	0.000010	0.000005	0.000005	0.000005	0.000010	0.000010	0.000010	0.000010	0.000008	0.000010	0.000010	0.000010
Total Molybdenum (Mo)	mg/L	n/a	n/a	0.073	0.009	0.008	0.007	0.015	0.006	0.010	0.007	0.017	0.001	0.001	0.001	0.001
Total Nickel (Ni)	mg/L	<u>0.25</u>	<u>0.5</u>	0.066	0.039	0.041	0.052	0.242	0.021	0.053	0.054	0.215	0.002	0.003	0.004	0.004
Total Selenium (Se)	mg/L	n/a	n/a	0.001	0.0003	0.0010	0.0003	0.0006	0.0003	0.0006	0.0002	0.0005	0.0001	0.0002	0.0002	0.0005
Total Silver (Ag)	mg/L	n/a	n/a	0.00025	0.00002	0.00008	0.00003	0.00004	n/a/n/a	n/a	n/a	n/a	0.00001	0.00002	n/a	n/a
Total Thallium (Ti)	mg/L	n/a	n/a	0.0008	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002
Total Zinc (Zn)	mg/L	<u>0.1</u>	<u>0.2</u>	0.028	0.009	0.030	0.012	0.023	0.006	0.008	0.007	0.013	0.008	0.048	0.001	0.002
Dissolved Arsenic (As)	mg/L	<u>0.1</u>	<u>0.2</u>	0.025	<u>0.143</u>	0.158	<u>0.265</u>	<u>1.770</u>	0.003	0.007	0.047	<u>0.412</u>	0.001	0.005	0.001	0.003
Dissolved Phosphorus (P)	mg/L	<u>0.3</u>	<u>0.6</u>	0.01	0.007	0.064	0.015	0.070	0.003	0.005	0.002	0.005	0.007	0.032	0.005	0.040

<b>XXXX</b>	Exceeds Water Licence criteria only
	Exceeds CCME guidelines only
	Exceeds FWQG only for Aluminium



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## 3.0 Water Quality Forecast Model

### 3.1 Description

The water quality forecast (WQF) model is based on a water/mass balance developed for the site to track the water movements during operation. The model was developed based on AEM 2022 Water Balance (AEM, 2022a) developed for the 2022 Water Management Plan (WMP).

The WQF model uses the inflows and outflows to each basin and pond as presented in the water balance provided by AEM and uses the water quality measurements taken around the Whale Tail Mine site to forecast concentrations of key constituents of concern (COCs). The WQF assess the forecasted concentrations of key COCs in the following ponds and basins:


- > WT and IVR Attenuation Ponds;
- > WT Pit / WTN Basin;
- > IVR Pit;
- > Mammoth Lake;
- > WTS Lake.

During the operation phase, the primary concern is the water quality around the WT and IVR Attenuation Ponds as it represents the environmental discharge to Mammoth and WTS Lakes and impacts the receiving environmental assimilative capacities. At closure and post-closure, the primary concern is the water quality around the flooded pits as it represents the water that shall reconnect to Mammoth Lake at post-closure, specifically WT pit which shall become the WTN Basin. For this reason, the WQF model for the pits are included only in closure and post-closure phases.

The WQF water/mass balance model was developed using the methodology and assumptions described in [Section 3.2](#).


### 3.2 Methodology and Assumptions

**Table 3-1** summarizes the methodology and assumptions used in the development of the water quality forecast (WQF) model for the Whale Tail Mine site.


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**Table 3-1 : Water Quality Forecast Model Methodology and Assumptions**

PARAMETERS	METHODOLOGY AND ASSUMPTIONS
<b>Water quality forecast model</b>	<ul style="list-style-type: none"> <li>• Mass balance model.</li> <li>• Assume completely mixed system.</li> <li>• Ponds/Lakes to model: WT and IVR Attenuation ponds, WT Pit/WTN Basin, IVR Pit, Mammoth Lake, WTS Lake.</li> <li>• WQF model results represent total constituent concentrations.</li> <li>• Input streams for water quality are based on a yearly average measured value.</li> <li>• For simplification of the model, ponds are assumed to be completely mixed systems.</li> <li>• For simplification of the model, the parameters are assumed to be inert: they do not degrade or react with other elements in the system.</li> <li>• During operation, the water/mass balance is performed around the WT and IVR Attenuation Ponds. The volume of water transferred out of these ponds are sent to the WTP for treatment prior to discharge to WTS Lake or Mammoth Lake.</li> <li>• At closure and post-closure, the focus of the model shifts to the WT Pit which shall become the WT North Basin which then reconnects to Mammoth Lake and WTS Lake at post-closure.</li> <li>• A treatment removal efficiency for each of the parameter of concern is considered based on the observed treatment efficiency of the WTP.</li> </ul>
<b>Model time period</b>	<ul style="list-style-type: none"> <li>• Start: January 2020</li> <li>• End: December 2049 (projected end date of post-closure period)</li> <li>• Time step: Monthly</li> </ul>
<b>Forecasted Constituents</b>	<ul style="list-style-type: none"> <li>• In the Final Environmental Impact Statement (FEIS), key COCs identified: Arsenic and Phosphorus</li> <li>• The following key COCs forecasted were identified in last year's annual report (Golder 2022) and shall be considered in this year's model:               <ul style="list-style-type: none"> <li>○ Anions: Chloride, Fluoride;</li> <li>○ Metals: Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Nickel, Selenium, Zinc;</li> <li>○ Others: Total Ammonia, Nitrate, Total Phosphorus.</li> </ul> </li> </ul>

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PARAMETERS	METHODOLOGY AND ASSUMPTIONS
<b>Input Source Terms</b>	<ul style="list-style-type: none"> <li>Water quality for the different input streams to the model is based on the yearly average measured values and are assumed to be constant over a given year.</li> <li>Following source terms are considered in the model. The water quality for key COCs are based on measured water quality data:               <ul style="list-style-type: none"> <li>WT WRSF;</li> <li>North-West (NW) sump (assumed similar to WT WRSF);</li> <li>Whale Tail Pit ;</li> <li>Quarry 1;</li> <li>Runoff from Road 7 (assumed similar to Quarry 1);</li> <li>WT Dike Seepage;</li> <li>IVR Pit;</li> <li>IVR WRSF sump IWA and IWB (assumed similar to WT WRSF);</li> <li>Whale Tail Camp Sewage Treatment Plant treated effluent;</li> <li>North East Pond (assumed similar to WT WRSF);</li> <li>Former Lakes A47 and A49 (assumed similar to Lake A47)</li> <li>Lakes A50, A51, A52 and A53 (assumed to be similar to average of lakes A50, A51, A52);</li> <li>Mammoth Lake;</li> <li>Whale Tail South Lake.</li> </ul> </li> <li>Precipitation runoff loading               <ul style="list-style-type: none"> <li>For runoff from the mine site, assumed to have a similar water quality as the water sampled at Lake A47;</li> <li>For runoff from WRSF, assumed to have a similar water quality as the water sampled at WT WRSF;</li> <li>For natural runoff to WTS and Mammoth Lake, assume to have a similar water quality as the water sampled at WTS Lake.</li> </ul> </li> </ul>
<b>Input Source Terms Adjustment during Operation</b>	<ul style="list-style-type: none"> <li>The water quality associated with the Whale Tail Pit source term was adjusted to obtain forecasted concentration for the COCs similar to the measured values sampled at the WT and IVR Attenuation Ponds.</li> </ul>
<b>Input Source Terms from Exposed Pit Walls</b>	<ul style="list-style-type: none"> <li>To account for potential leaching of COCs from the pit walls during reflooding, the following is assumed:               <ul style="list-style-type: none"> <li>During pit re-flooding, the runoff water entering the pit is assumed to have the same water quality as the values measured in the pits in 2022;</li> <li>Per the Interim Closure and Reclamation Plan (ICRP), the exposed pit walls that are prone to leach arsenic shall be sloped back and covered with overburden and rip rap. Note that the feasibility of sloping back and covering the exposed pit walls prone to arsenic leaching will be evaluated and updated in the final closure plan.</li> <li>Once the water level reaches the pit crest, all of the pit walls shall be submerged, and it is assumed that the closure work on exposed pit walls prone to arsenic leaching shall be completed. At that time, the water quality from the runoff is assumed to be similar to natural runoff from the site.</li> </ul> </li> </ul>
<b>Water treatment</b>	<ul style="list-style-type: none"> <li>Water treatment is required during operation (2020 to 2025).</li> <li>Water quality in WT-2 and WT-24 represent the quality of the treated effluent in-situ.</li> <li>At closure, no water treatment is forecasted to be required.</li> <li>A treatment removal efficiency for each of the parameter of concern is considered based on the observed average treatment efficiency of the WTP in 2021 and 2022.</li> </ul>

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PARAMETERS	METHODOLOGY AND ASSUMPTIONS
Pit reflooding	<ul style="list-style-type: none"> <li>Pits shall be reflooded by natural runoff from the site and active transfer of water from WTS Lake;</li> </ul>


### 3.3 Limitations

The limitations of the Whale Tail Mine site water quality forecast water/mass balance model and ensuing results and conclusions presented in this Technical Note are listed below:

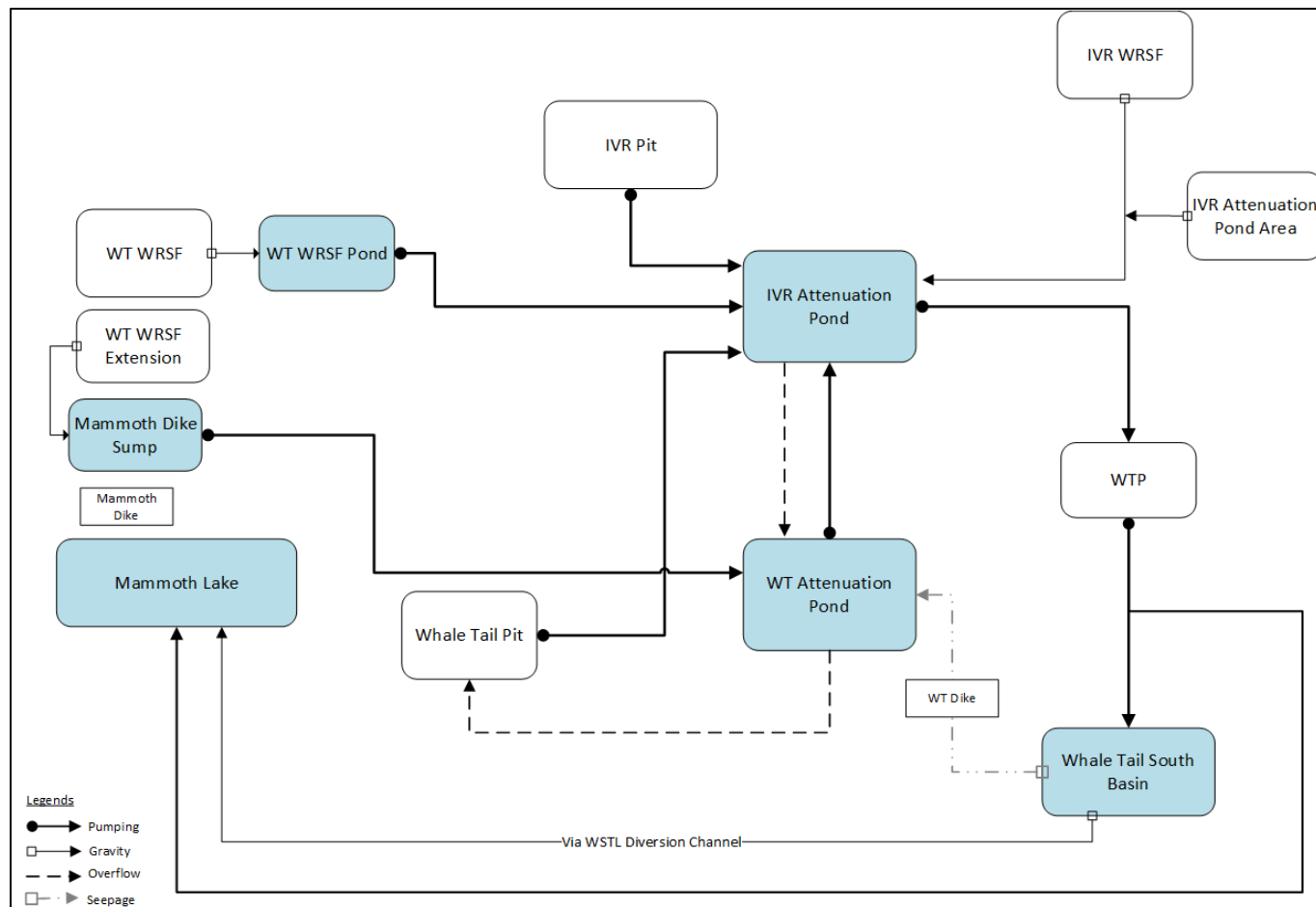
- i. In order to simplify the model, the mass balance model assumes that the ponds, pits and lakes are completely mixed systems. Consequently, the results from this model provide an indication of the concentrations in these areas and should not be considered as an absolute value at this time. Future monitoring results both for flows and water quality will provide for a better indication of concentrations of contaminants.
- ii. The mass balance model is based on the water quality analysis results provided by AEM.
- iii. The model is based on a monthly time-step and the resulting concentrations provided represent monthly values.
- iv. It should be noted at this point that the model should be used to evaluate at a high level the impact of operation and closure activities at the Whale Tail Mine site on the future water quality in the WT Pit / WTN Basin, the IVR Pit, Mammoth Lake and WTS Lake. The forecasted concentration should be considered as an order of magnitude estimate only considering that the model uses monthly volumes that are transferred around the site and assumes a fixed water quality concentration for each input stream over time.
- v. The present mass balance model cannot simulate the treated effluent plume discharged in Mammoth Lake or Whale Tail South Lake. A hydrodynamic model is required to simulate the discharge of treated effluent in these lakes, which is beyond the scope of this study.
- vi. Furthermore, this model is intended as a mass balance model for the Whale Tail Mine site and should be updated and calibrated on a yearly basis as additional water quality data, pond volumes and flows in the area become available. Refer to [Section 5.2](#) for recommendations on improving the WQF model.


### 3.4 Block Flow Diagram

**Figures 3-1 to 3-3** present the block flow diagram of the water management plan at the Whale Tail mine during Operation, closure and post-closure. Since June 2021, IVR Attenuation Pond is considered active to receive contact water from the mine besides WT Attenuation Pond.

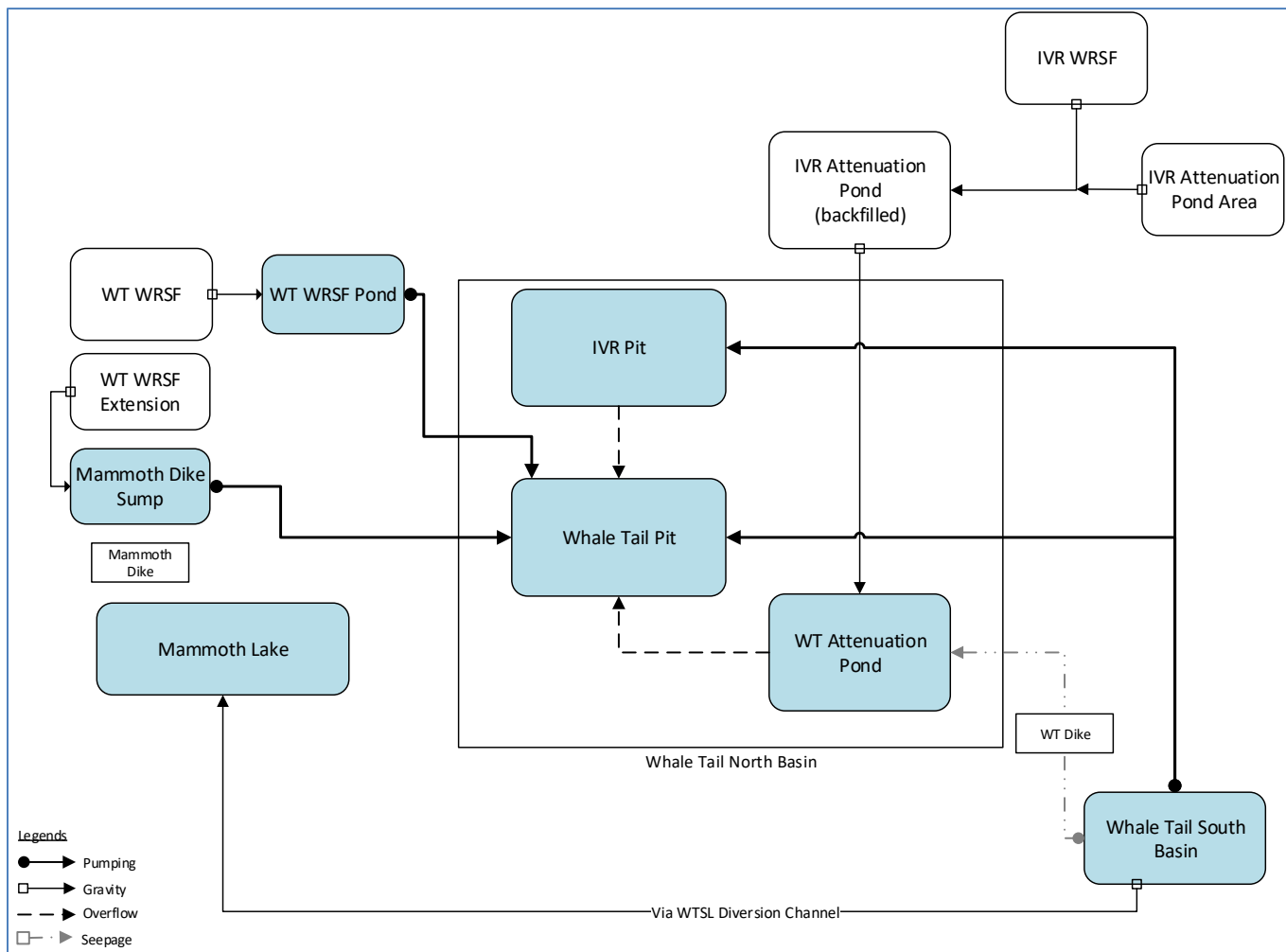
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**Figure 3-1: Conceptual Flow Diagram at Whale Tail Mine During Operation (2020-2025)**



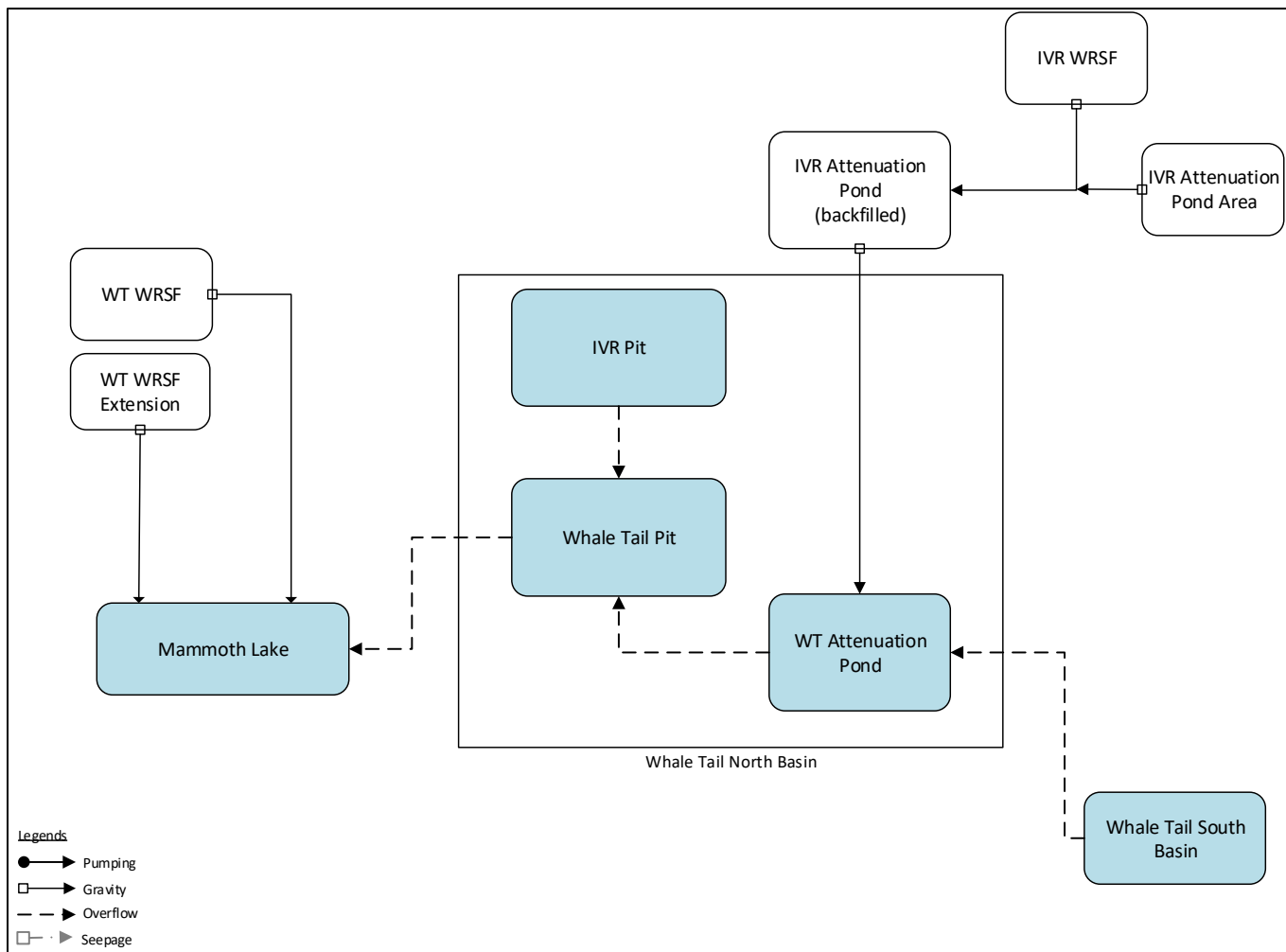
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**Figure 3-2: Conceptual Flow Diagram at Whale Tail Mine During Closure (2026-2044)**



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**Figure 3-3: Conceptual Flow Diagram at Whale Tail Mine During Post-Closure (2045-2049)**



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### 3.5 Input Parameters

A compilation of the measured water quality data sampled at the Whale Tail Mine site in 2022 was performed for the following sectors:

- > WT Attenuation Pond (sampling point ST-WT-1);
- > IVR Attenuation Pond (sampling point ST-WT-23);
- > Whale Tail Pit Sump (sampling point ST-WT-4);
- > IVR Pit-Sump (sampling point ST-WT-18);
- > Whale Tail Dike Seepage (sampling point ST-WT-17);
- > WRSF Pond (sampling point ST-WT-3);
- > Mammoth Lake (sampling point MAME-2);
- > WTS Lake (sampling point WTSE).


The measured water quality of 2022 was added to measured data conducted at the Whale Tail Mine site between 2019 and 2021 and used as a database to implement the water quality forecast model.

**Table 3-2** summarizes the water quality characteristics for various input source streams used in the water quality forecast model.



Table 3-2: Input Source Stream Concentration used in the WQF Model

Input Streams	Notes	Units	Ammonia	Nitrate	Chloride	Fluoride	Total Phosphorus	Total Aluminium	Total Arsenic	Total Cadmium	Total Chromium	Total Copper	Total Iron	Total Lead	Total Manganese	Total Mercury	Total Nickel	Total Selenium	Total Zinc
WT WRSF	Average 2018-2022	mg/L	0.1	2.2	11	0.090	0.023	0.636	0.009	0.00003	0.0066	0.003	1.862	0.00061	0.224	0.000015	0.021	0.0016	0.005
NW Sump	Assume same as WT WRSF	mg/L	0.1	2.2	11	0.090	0.023	0.636	0.009	0.00003	0.0066	0.003	1.862	0.00061	0.224	0.000015	0.021	0.0016	0.005
Whale Tail Pit	Average 2021-2022	mg/L	1.6	1.5	50	0.220	0.043	0.395	0.435	0.00004	0.1292	0.008	7.399	0.00566	0.407	0.000008	0.120	0.0005	0.016
Whale Tail Pit - Adjusted	Adjusted to obtain WQF similar to measured values in Attenuation Ponds	mg/L	11.4	14.7	100.8	0.4	0.043	7.9	1.1	0.00034	0.1	0.025	14.8	0.05659	2.036	0.000008	0.300	0.0021	0.1
Quarry 1	Average from 2019 to 2020, Ca, Cl and TDS assume same as Whale Tail Pit	mg/L	0.9	0.0	53	0.000	0.010	0.052	0.010	0.00002	0.0012	0.007	0.130	0.00031		0.000010	0.016		
Runoff Road 7	Same as Quarry 1	mg/L	0.9	0.0	53	0.000	0.010	0.052	0.010	0.00002	0.0012	0.007	0.130	0.00031	0.000	0.000010	0.016	0.0000	0.000
WT Dike Seepage	Average from 2019 to 2022	mg/L	0.047	0.3	15	0.100	0.016	0.226	0.009	0.00002	0.0042	0.005	0.486	0.00033	0.085	0.000009	0.002	0.0004	0.004
IVR Pit	Average from 2021-2022	mg/L	9.2	15.2	263	0.167	1.867	21.689	4.031	0.00020	0.8891	0.029	37.159	0.01827	1.532	0.000024	0.597	0.0028	0.069
IVR WRSF IWB	Assume same as WT WRSF	mg/L	0.1	2.2	11	0.090	0.023	0.636	0.009	0.00003	0.0066	0.003	1.862	0.00061	0.224	0.000015	0.021	0.0016	0.005
IVR WRSF IWA	Assume same as WT WRSF	mg/L	0.1	2.2	11	0.090	0.023	0.636	0.009	0.00003	0.0066	0.003	1.862	0.00061	0.224	0.000015	0.021	0.0016	0.005
Whale Tail Camp STP Effluent	Average from 2019 to 2020	mg/L	0.1	18.3	75	0.063	5.657	0.060	0.005	0.00003	0.0012	0.018	0.079	0.00046	0.009	0.000011	0.007	0.0013	0.058
NE Pond	Assume same as Lake A47	mg/L	0.2	0.0	104	0.060	0.010	0.164	0.008	0.00004	0.0036	0.001	0.740	0.00027	0.365	0.000010	0.008	0.0008	0.004
Lake A47	Average 2020, assume TP and TAs equal to dissolved measurements	mg/L	0.2	0.0	104	0.060	0.010	0.164	0.008	0.00004	0.0036	0.001	0.740	0.00027	0.365	0.000010	0.008	0.0008	0.004
Lake A49	Assume same as A47	mg/L	0.2	0.0	104	0.060	0.010	0.164	0.008	0.00004	0.0036	0.001	0.740	0.00027	0.365	0.000010	0.008	0.0008	0.004
Lake A50	Average from sample taken in August 2019 for lakes A50, A51 and A52	mg/L	0.1	0.0	346	0.060	0.010	0.045	0.0005	0.00022	0.0008	0.0005	0.193	0.00030	1.067	0.000010	0.029	0.0006	0.017
Lake A51		mg/L	0.1	0.0	346	0.060	0.010	0.045	0.0005	0.00022	0.0008	0.0005	0.193	0.00030	1.067	0.000010	0.029	0.0006	0.017
Lake A52		mg/L	0.1	0.0	346	0.060	0.010	0.045	0.0005	0.00022	0.0008	0.0005	0.193	0.00030	1.067	0.000010	0.029	0.0006	0.017
Lake A53	Average from 2019 to 2020 data and certain values assumed similar to lake A50	mg/L	0.1	0.0	346	0.060	0.0010	0.006	0.001	0.00022	0.0008	0.011	0.2	0.00030	1.1	0.000010	0.004	0.0006	0.003
Mammoth D/S	Average 2020-2022	mg/L	0.06	1.5	26	0.057	0.006	0.006	0.001	0.00001	0.0004	0.001	0.030	0.00006	0.017	0.000005	0.002	0.0002	0.003
Runoff (natural terrain)	Assumed to be similar to natural lake A47 quality	mg/L	0.2	0.0	104.1	0.1	0.0	0.164	0.0	0.0	0.0	0.0	0.7	0.0	0.4	0.0	0.0	0.0	0.0
Runoff (rock area)	Assume same as WT WRSF	mg/L	0.1	2.2	11	0.090	0.023	0.636	0.009	0.00003	0.0066	0.003	1.862	0.00061	0.224	0.000015	0.021	0.0016	0.005
Initial Concentration at WT Attenuation Pond	Average 2020 May data	mg/L	2.3	4.1	84	0.14	0.015	0.128	0.02	0.00001	0.0037	0.004	0.63	0.00040	0.23	0.000005	0.01	0.0005	0.00
Initial Concentration at Lake A53 (future IVR Attenuation Pond)	Average from 2019 to 2020 data and certain values assumed similar to lake A50	mg/L	0.1	0.01	346.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.1	0.0	0.0	0.0	0.0
Initial Concentration at WTS Lake	January 2020. When no data available, take average of 2020 data.	mg/L	0.1	0.1	17	0.000	0.020	0.010	0.001	0.00001	0.0003	0.000	0.120	0.00015	0.069	0.000005	0.002	0.0005	0.002
Initial Concentration at Mammoth Lake	April 2020 data. When no data available, take average of 2020 data.	mg/L	0.2	3.1	45	0.057	0.005	0.003	0.002	0.00001	0.0017	0.001	0.020	0.00015	0.072	0.000005	0.003	0.0005	0.001
Natural runoff to Lakes	Assume to be similar to WTSL water.	mg/L	0.1	0.3	16	0.0	0.007	0.009	0.001	0.00001	0.0003	0.001	0.2	0.00008	0.1	0.000006	0.0026	0.0003	0.0012
WTP Percent Removal Efficiency	Average % removal from 2021 and 2022 measured at WTP (raw water vs treated water).	%	0%	0%	0%	0%	90%	98%	88%	43%	94%	90%	99%	87%	12%	0%	0%	19%	0%

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### 3.6 Guidelines


The forecasted concentrations are compared in this Technical Note to the discharge criteria outlined in the Water Licence and to the CCME guidelines. These guidelines are used as a guide only to identify potential COCs during operations, closure and post-closure. **Table 3-3** summarizes the guidelines used in the model.

**Table 3-3: Discharge Criteria and CCME Guidelines for the Constituents Evaluated**

PARAMETER	DISCHARGE CRITERIA & WATER QUALITY GUIDELINES	
	Water Licence <sup>(1)</sup> (Part F)	CCME (guideline date)
Arsenic (As)	0.1 mg/L	0.025 mg/L <sup>(2)</sup>
Aluminium	0.5 mg/L	0.035 mg/L <sup>(7)</sup>
Cadmium (Cd)	0.002 mg/L	0.00011 mg/L <sup>(2)</sup>
Chromium (Cr)	0.02 mg/L	0.001 mg/L <sup>(2)</sup>
Copper (Cu)	0.1 mg/L	0.002 mg/L <sup>(3, 4)</sup> (1987)
Iron (Fe)	1.0 mg/L	0.3 mg/L <sup>(3)</sup> (1987)
Lead (Pb)	0.05 mg/L	0.0017 mg/L <sup>(3, 8)</sup> (1987)
Manganese (Mn)	<i>no criteria</i>	0.49 mg/L <sup>(2)</sup>
Mercury (Hg)	0.004 mg/L	0.000026 mg/L <sup>(3)</sup> (2003)
Nickel (Ni)	0.25 mg/L	0.00657 mg/L <sup>(2)</sup>
Selenium (Se)	<i>no criteria</i>	0.001 mg/L <sup>(3)</sup> (1987)
Zinc (Zn)	0.1 mg/L	0.028 mg/L <sup>(2)</sup>
Total Ammonia (NH <sub>3</sub> )	16 mg N/L	12.60 mg N/L <sup>(2)</sup>
Nitrate (NO <sub>3</sub> )	<i>no criteria</i>	2.93 mg N/L <sup>(3, 6)</sup> (2012)
Chloride (Cl)	1,000 mg/L	120 mg/L <sup>(3, 5)</sup> (2011)
Fluoride (F)	<i>no criteria</i>	0.12 mg/L <sup>(3)</sup> (2002)
Total Phosphorus (P)	0.3 mg/L	0.01 mg/L <sup>(2)</sup>

**Notes:**

- (1) Water Licence 2AM-WTP1830 (Part F) discharge criteria.
- (2) Criteria presented in the FEIS.
- (3) CCME criteria as per the Water Quality Guidelines for the Protection of Aquatic Life for freshwater and long-term exposure. Criteria referenced from [www.ccme.ca](http://www.ccme.ca) in 2021.
- (4) The copper discharge criterion depends on hardness. For hardness between 0 to 82 mg/L CaCO<sub>3</sub>, the copper limit is set at 2 µg/L.
- (5) This is the long-term chloride concentration limit. The short-term concentration limit is 640 mg/L.
- (6) This is the long-term nitrate concentration limit (13 mg/L as NO<sub>3</sub>). The short-term concentration limit is 550 mg/L.
- (7) Aluminum discharge criterion based on the FWQG, 2022.
- (8) Lead discharge criterion depend on hardness. For hardness between 0 to 60 mg/L CaCO<sub>3</sub>, the limit is set at 0.0017 mg/L.

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## 4.0 Water Quality Forecast Results

The constituents of concern (COCs) evaluated in the WQF model are limited to the same constituents that were identified during the Final Environmental Impact Statement (FEIS) Assessment during Operation: arsenic and phosphorus. Furthermore, additional COCs identified in the last year's annual report (Golder 2022) are considered in the WQF model during Closure and Post-Closure.

Water quality forecasted concentrations are respectively presented in [Figure 4-1](#) to [Figure 4-10](#). In each figure, the following information are presented:

- Updated Forecast total concentration of the COC;
- FEIS Forecasted total concentration for the COC;
- Measured concentrations of the COC;
- Water licence monthly average criterion (2AM-WTP1830) for the COC;
- CCME guideline (total concentration) for the COC.

### 4.1 During Operations

[Figure 4-1](#) and [Figure 4-2](#) presents the forecasted concentration for Total Arsenic and Total Phosphorous in the WT and IVR Attenuation Ponds, Mammoth Lake and WTS Lake. These two parameters were identified as potential COCs in the FEIS. Additional figures are presented in [Appendix 1](#) for the potential COCs that are considered at Closure and Post-Closure.



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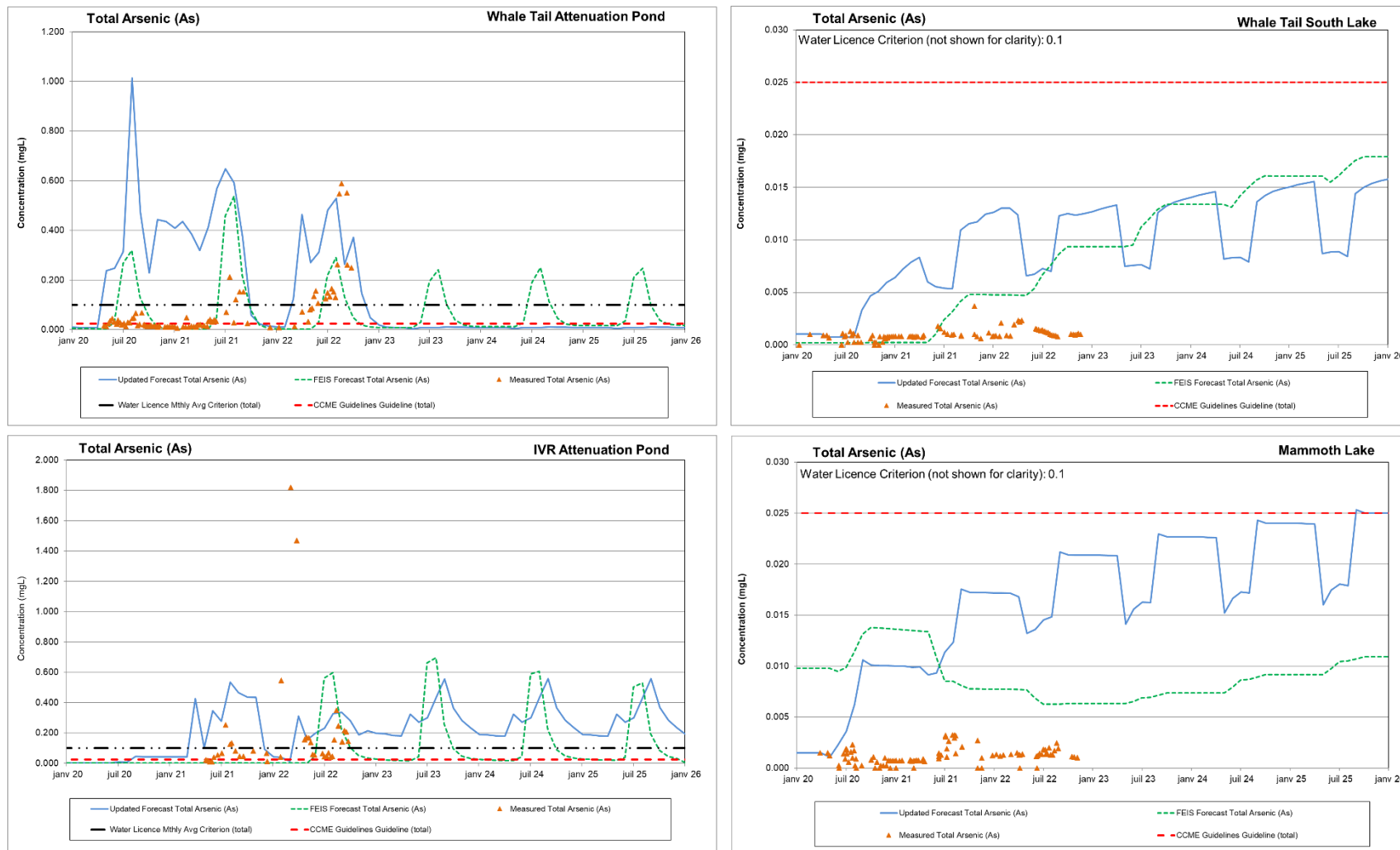
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Figure 4-1: Total Arsenic Forecasted Concentrations during Operation





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Figure 4-2: Total Phosphorous Forecasted Concentrations during Operation



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## 4.2 During Closure and Post-Closure

**Figure 4-3** to **Figure 4-10** present the forecast concentrations for 16 elements that were identified as potential COCs during Closure and Post closure in last year's annual report, specifically:

- > total As, total Phosphorous;
- > total Cd, total Cr;
- > total Cu, total Fe;
- > total Pb, total Mn;
- > total Hg, total Ni;
- > total Se, total Zn;
- > total Ammonia, total Nitrate; and
- > Chloride, Fluoride.

For each potential COC, two figures were generated to present the forecasted concentration in the WT Pit (which become the Whale Tail North (WTN) Basin at closure and post-closure and Mammoth Lake. These two locations were selected since:

- > At Closure, all of the runoff from the Whale Tail Mine site shall report to the WTN Basin.
- > At Post-Closure, once the WT Dike and Mammoth Dike are breached, water shall flow from WTS Lake to WTN Basin and finally to Mammoth Lake.



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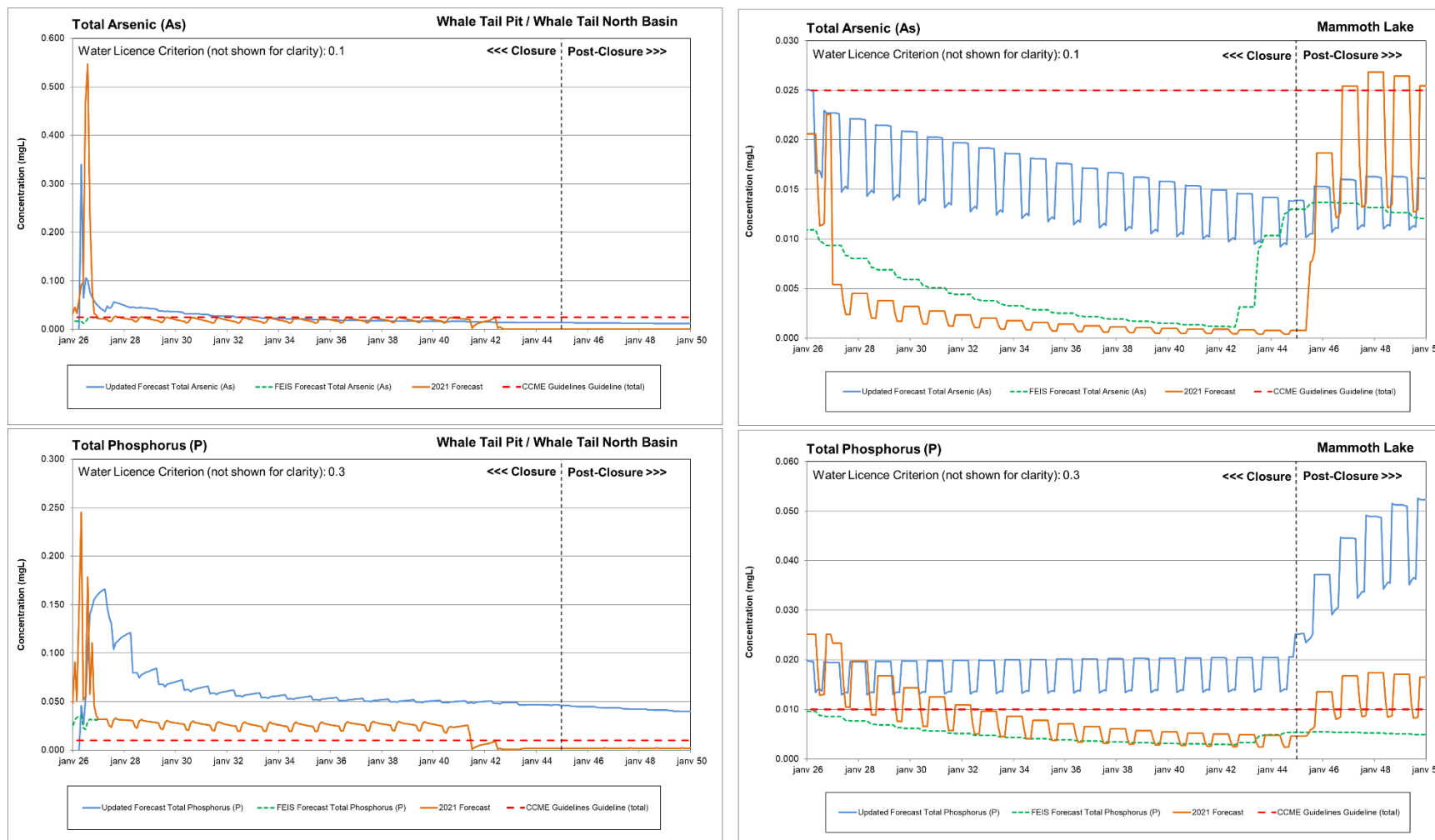
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Figure 4-3: Total Arsenic and Phosphorus Forecasted Concentrations During Closure and Post-closure







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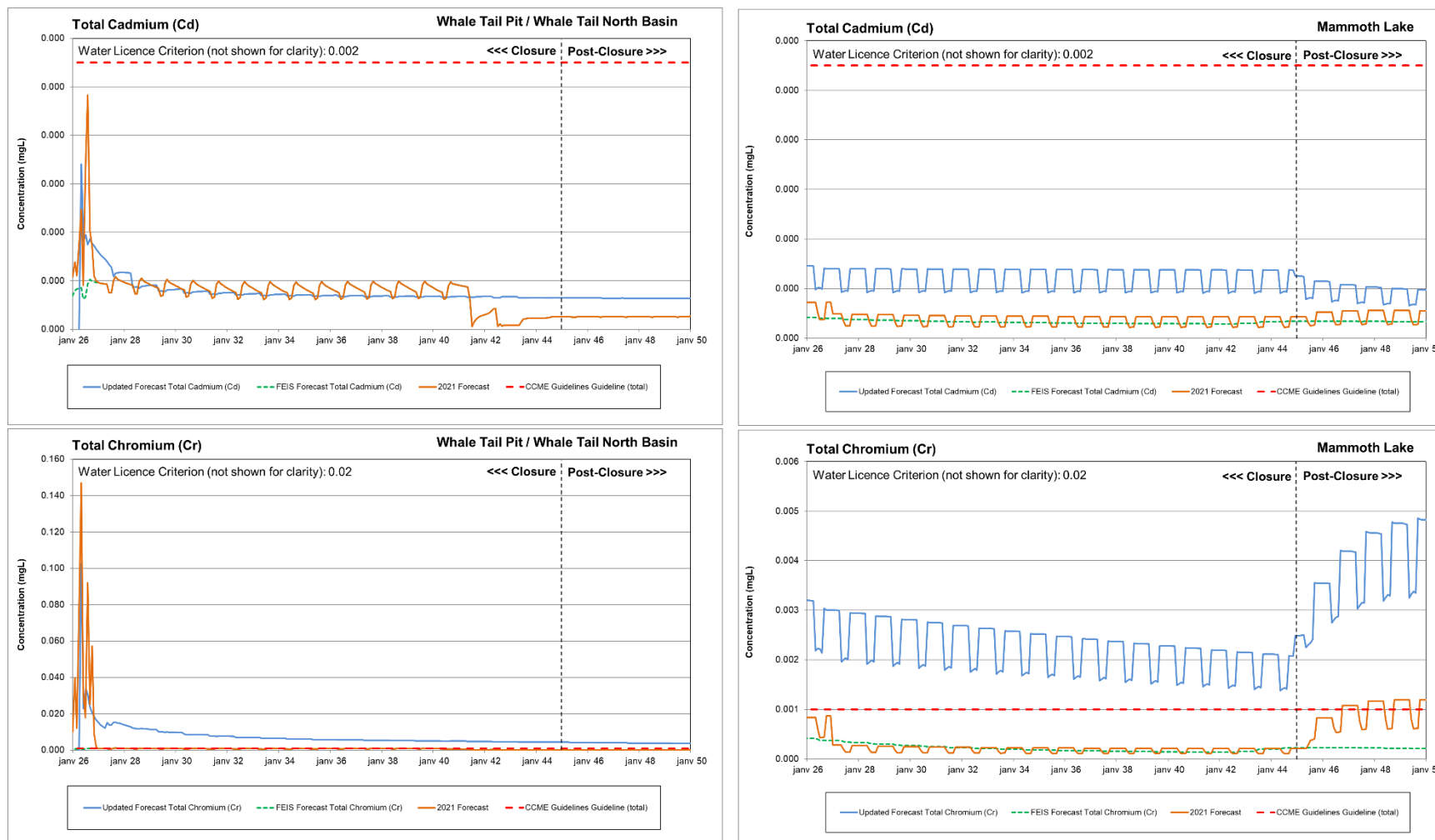
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Figure 4-4: Total Cadmium and Chromium Forecasted Concentrations During Closure and Post-closure





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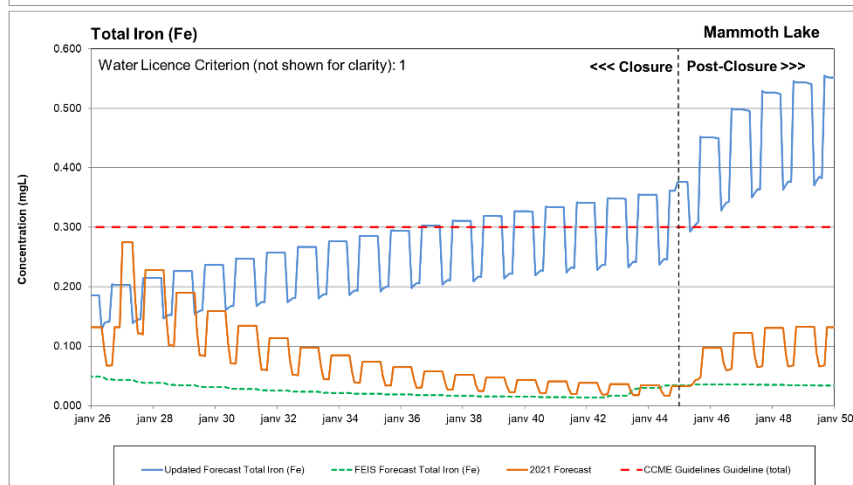
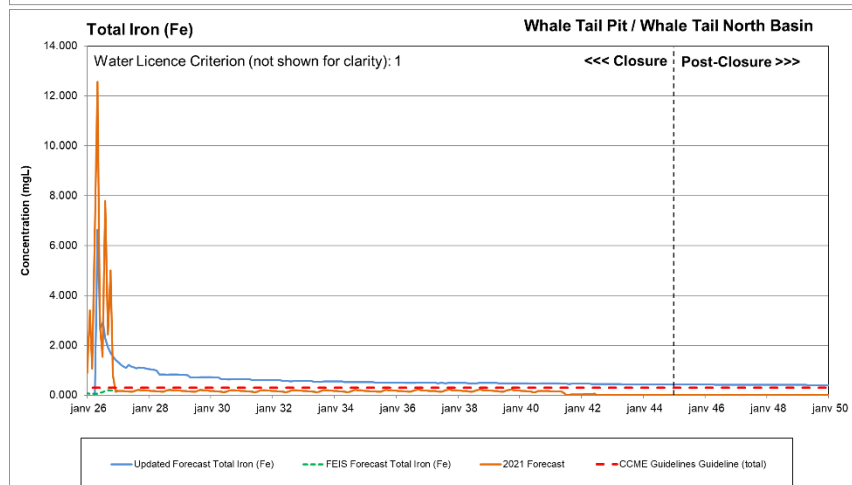
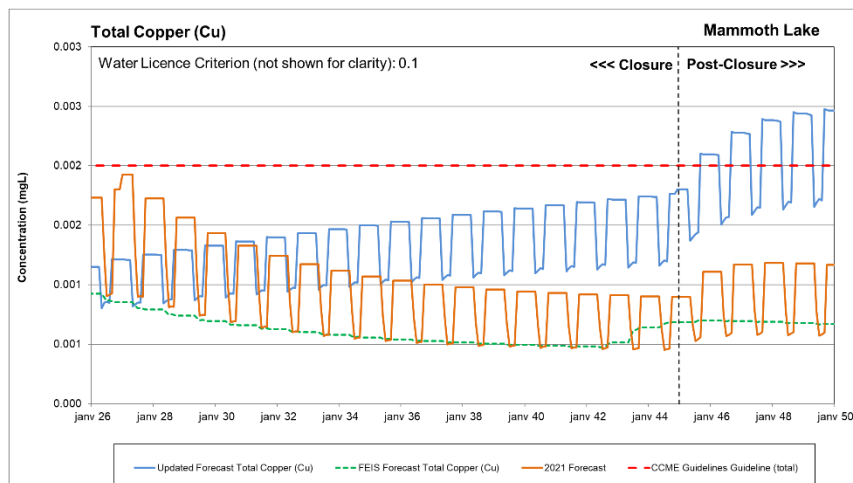
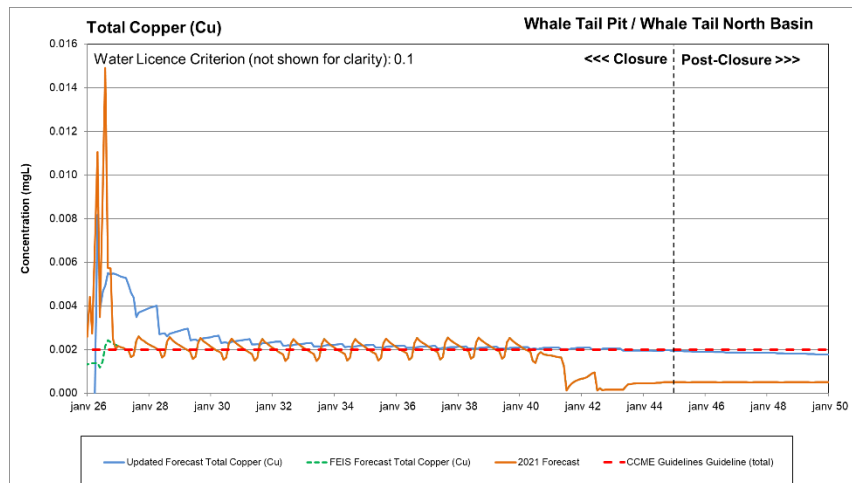
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Figure 4-5: Total Copper and Iron Forecasted Concentrations During Closure and Post-closure





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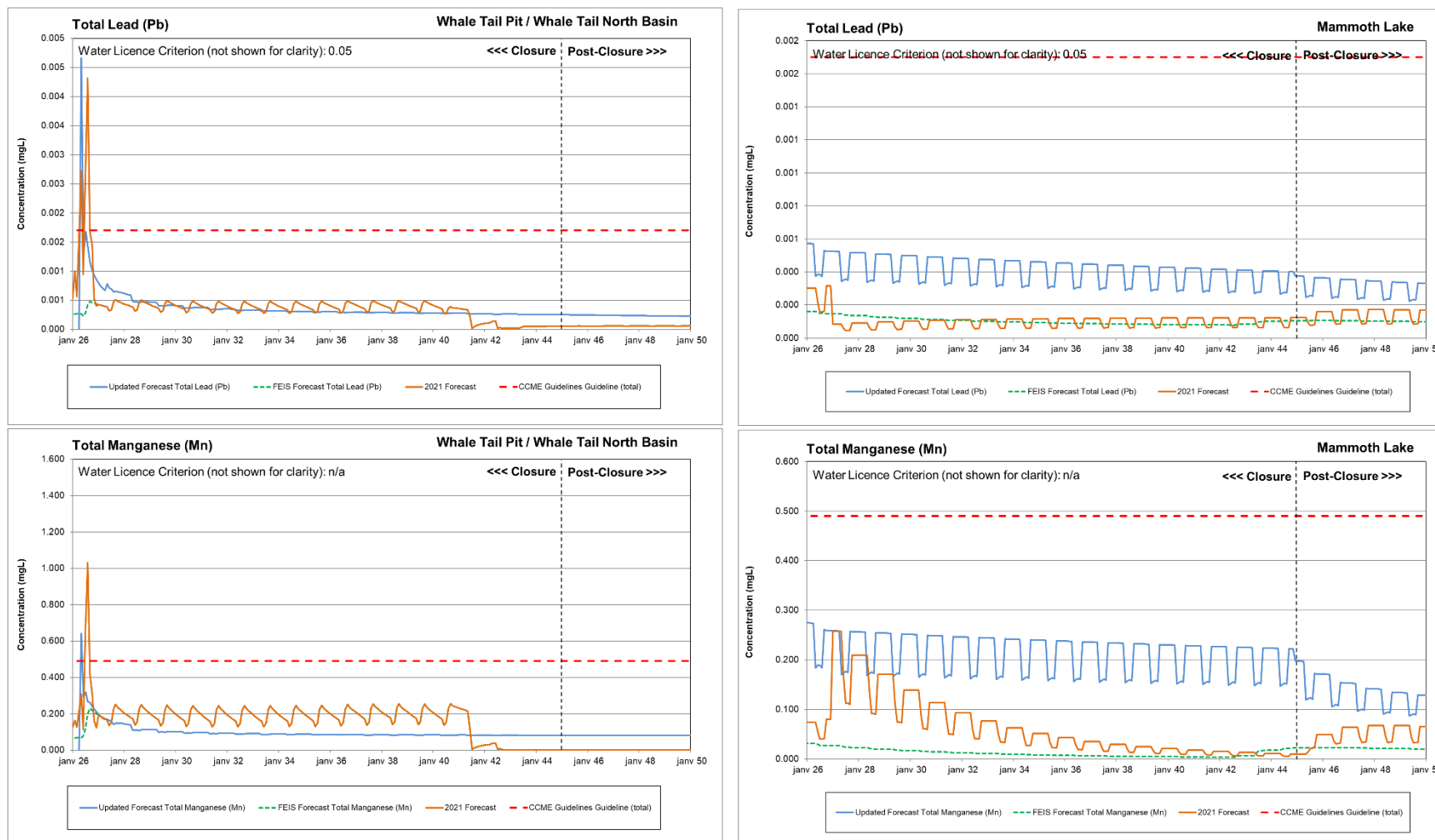
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Figure 4-6: Total Lead and Manganese Forecasted Concentrations During Closure and Post-closure





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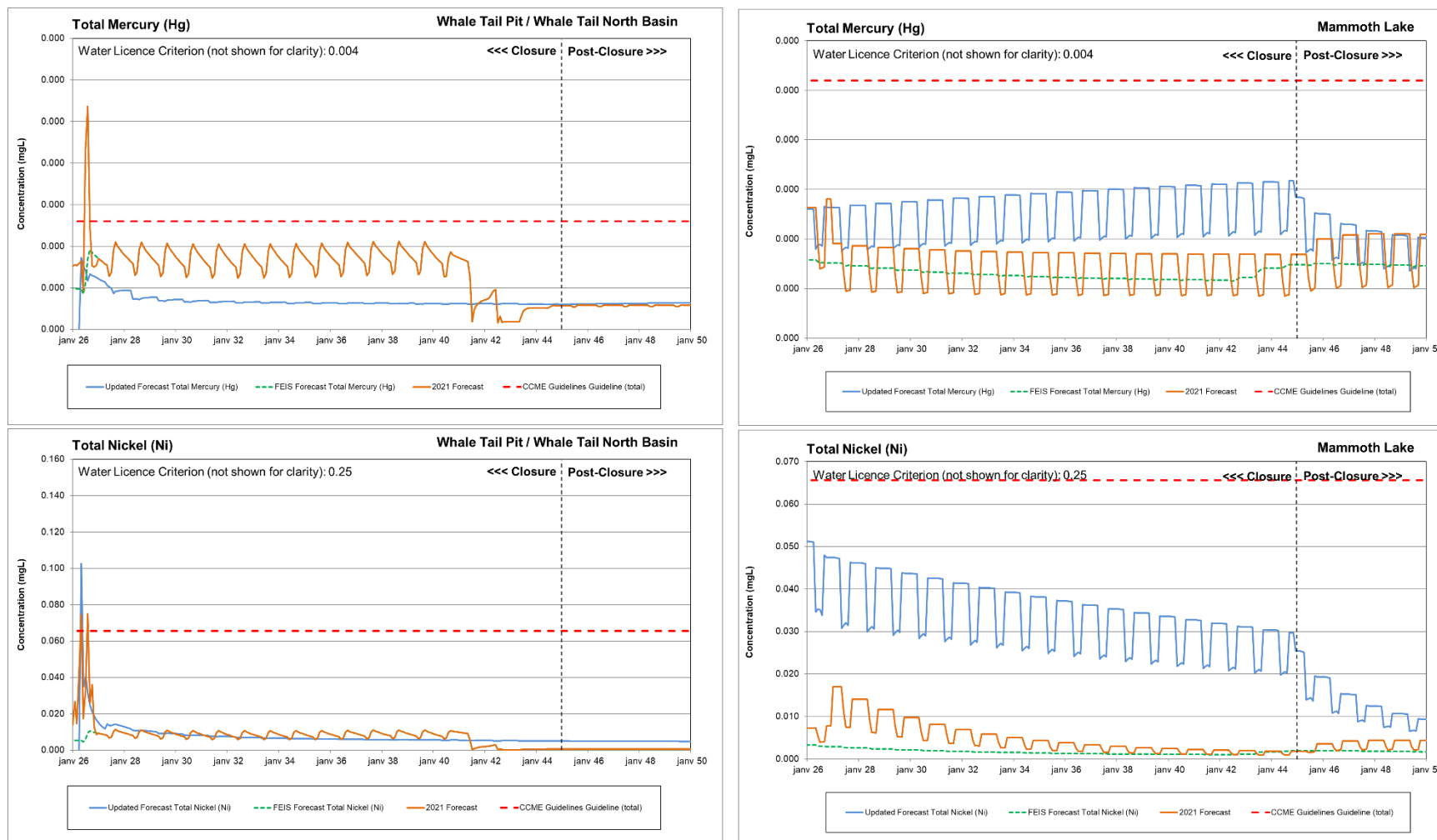
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Figure 4-7: Total Mercury and Nickel Forecasted Concentrations During Closure and Post-closure





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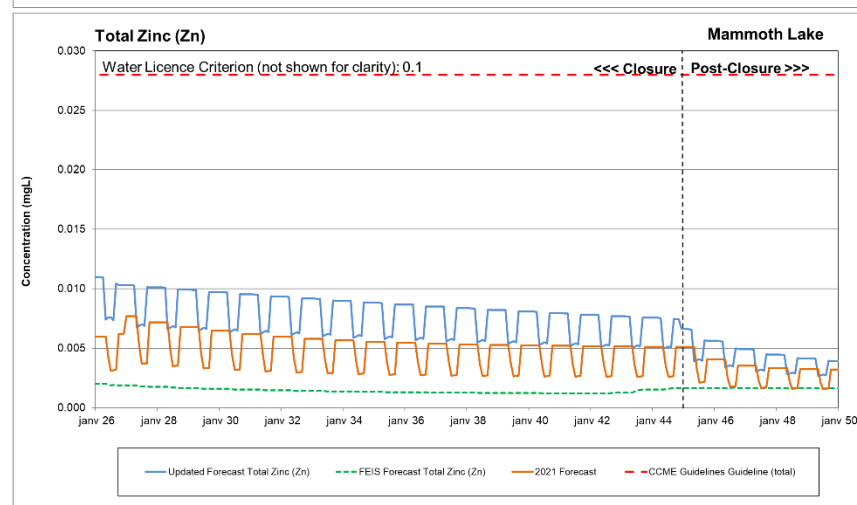
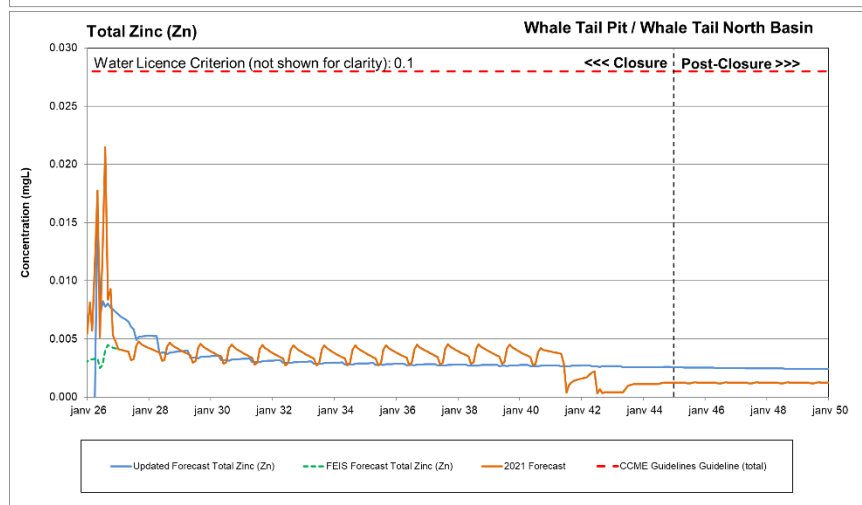
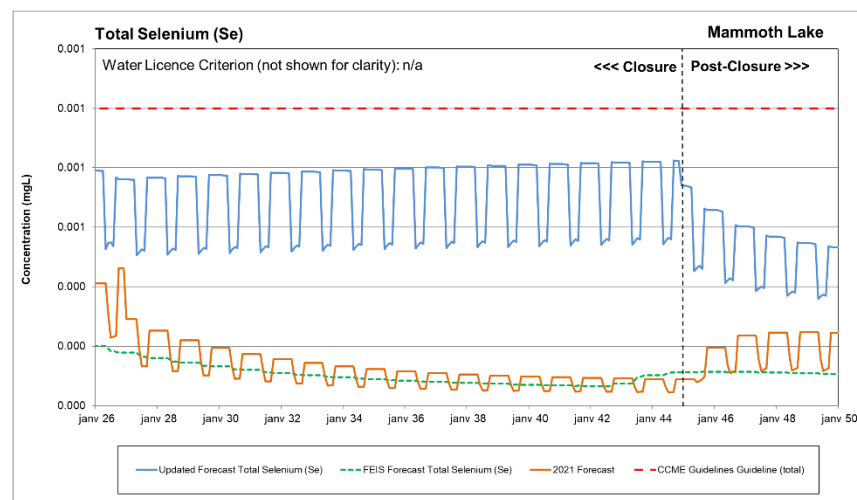
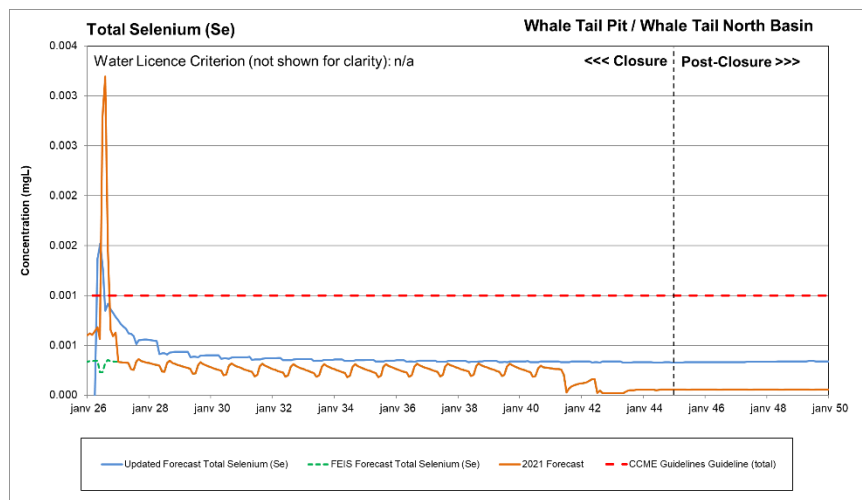
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Figure 4-8: Total Selenium and Zinc Forecasted Concentrations During Closure and Post-closure





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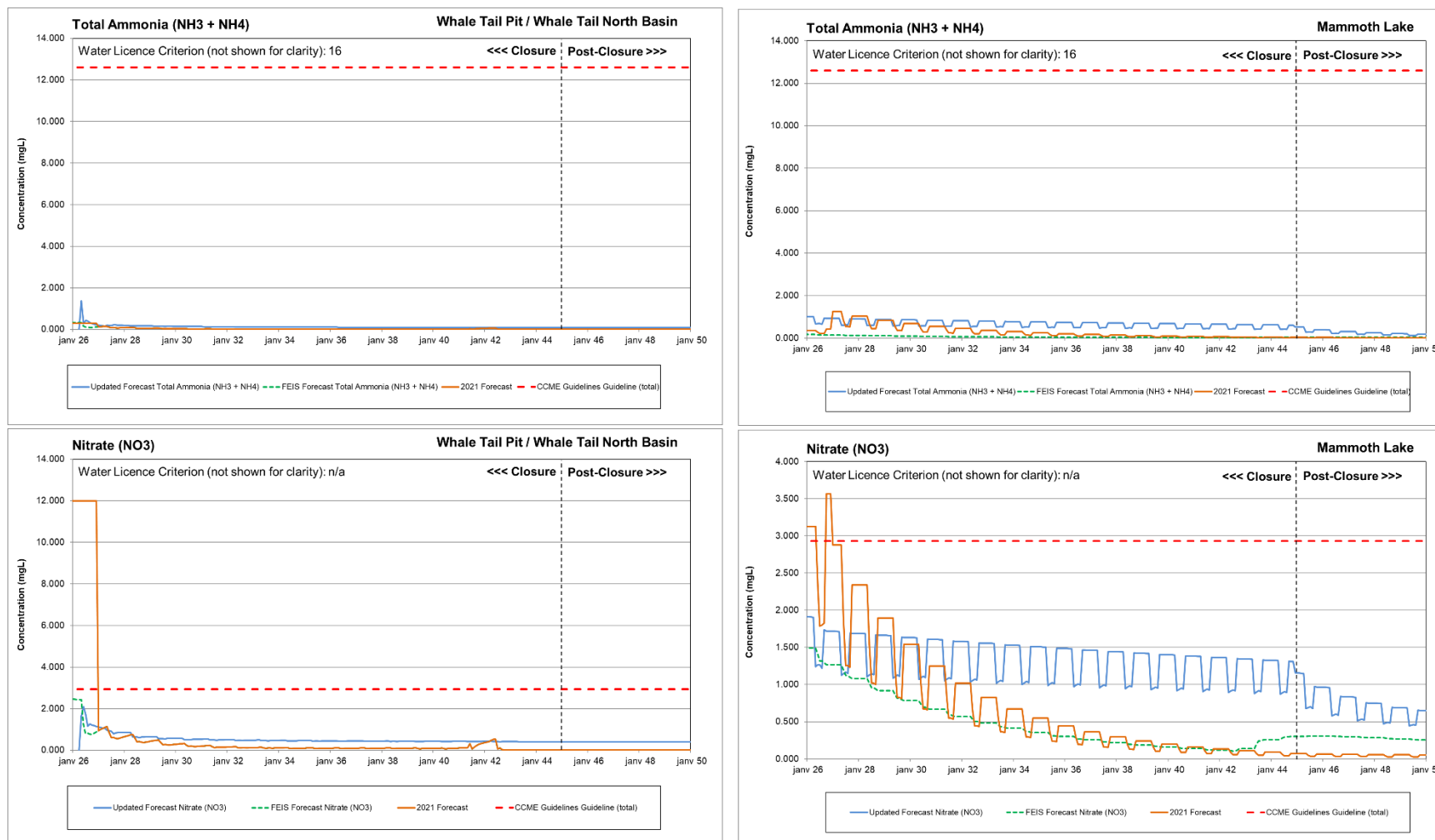
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Figure 4-9: Total Ammonia and Nitrate Forecasted Concentrations During Closure and Post-closure





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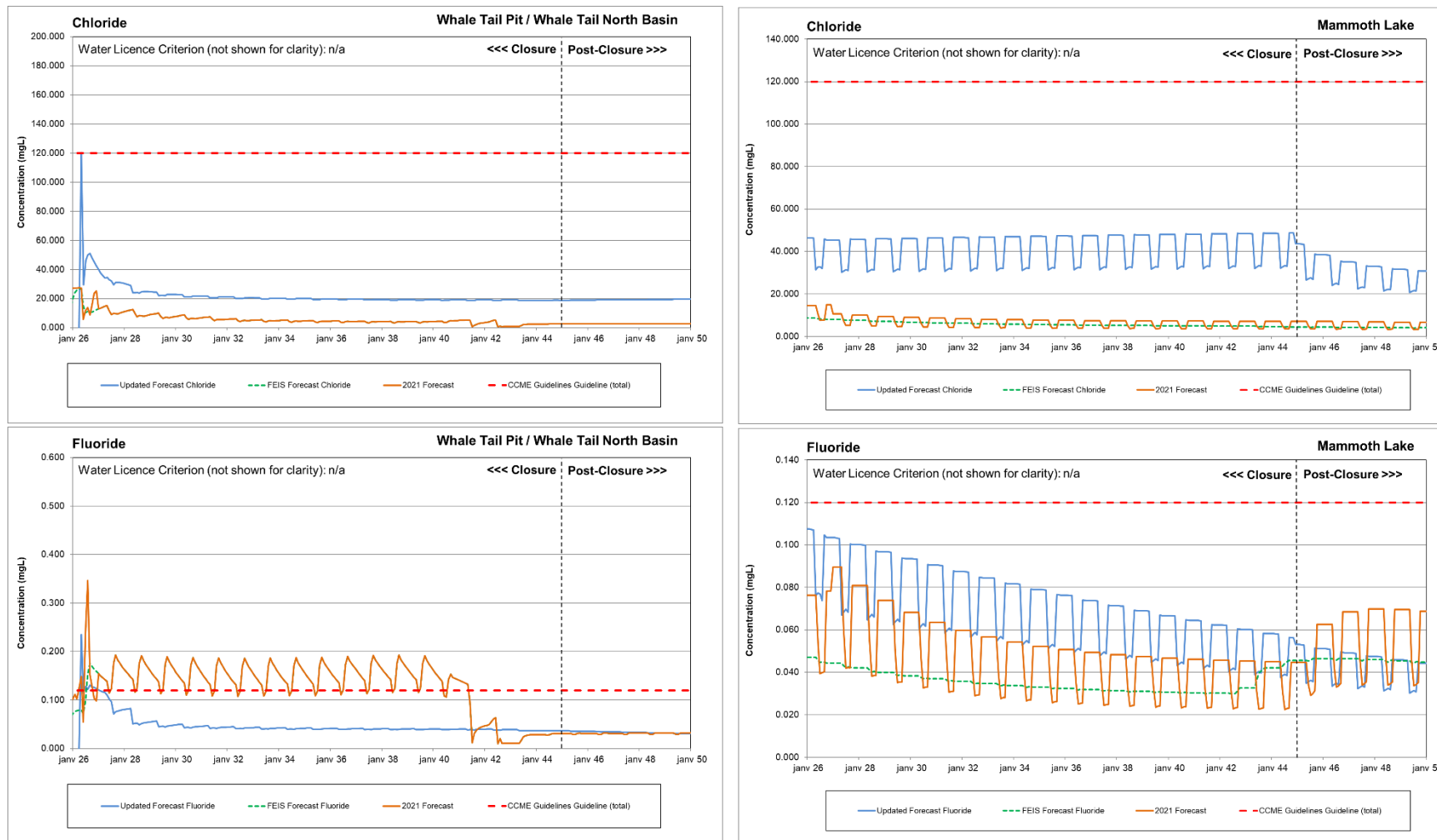
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Figure 4-10: Chloride and Fluoride Forecasted Concentrations During Closure and Post-closure





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## 4.3 Discussions

### 4.3.1 During Operation

Based on the water quality forecast modelling results during Operation, the following key observations can be made:


- > The WQF model forecasted concentrations are generally higher than the measured values, indicating that the model is conservative in its assessment.
- > Water quality forecasted concentrations show general conformity to the forecasted values presented in the FEIS and the measured concentrations on site in both the Attenuation Ponds and Lakes.
- > The WQF model forecasted concentration that are generally higher than the FEIS forecasted values.
- > In both Attenuation Ponds (Whale Tail and IVR):
  - > Total Arsenic concentrations measured and forecasted are higher than the Water Licence discharge criterion.
  - > Total Phosphorous concentrations forecasted were expected to be close to or higher than the Water Licence criterion during the winter months. However, the measured value indicated that the concentrations remain below the Water Licence criterion.
  - > Both potential COCs are forecasted to increase over the winter months due to cryo-concentration effect (i.e. ice formation over the pond) and decrease over the summer months until the end of Operations.
  - > The following COCs are also forecasted to be higher than their respective Water Licence discharge criterion: Chromium and Iron.
- > In both lakes (Mammoth and Whale Tail South Lake):
  - > As shown in [Section 2.4](#), the treated effluent discharged to these lakes generally meets the Water Licence criteria for Arsenic and Phosphorus.
  - > Total Arsenic concentrations are forecasted to increase during Operation but remain below the water licence criterion for this constituent. This follows the same trend presented in the FEIS assessment. Forecasted concentrations for this constituent are higher than the measured concentrations on site.
  - > Total Phosphorus concentrations are also forecasted to increase during Operations. The Forecasted concentrations are almost in the same range as the measured values on site and are trending slightly above the CCME guidelines.
- > In general, the WQF model provides a conservative assessment of the water quality during operation by assuming a fixed constant loading for each source term that does not decrease over time. Furthermore, a fixed water treatment efficiency is used based on average treatment efficiency observed at the WTP. Some of the treatment efficiency could be higher considering that some of the forecasted values are an order of magnitude higher than the measured values in Mammoth and WTS Lakes.

### 4.3.2 During Closure

Based on the water quality forecast modelling results during Closure, the following key observations can be made:

#### Comparison to CCME guidelines:

- > In WT Pit / WTN Basin, concentrations of most parameters are forecasted to decrease over the closure period and reach CCME limits, except for the following parameters: total Phosphorus and total Chromium
- > Total Phosphorus loading to WT Pit / WTN Basin comes mainly from the discharge of treated camp sewage water during this period. Note that the loading applied during this period was assumed to

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be the same as the loading applied during Operation, which provides a certain level of conservatism to the WQF model.

- > Total Chromium loading to WT Pit / WTN Basin comes mainly from the runoff coming into contact with the pit walls in WT and IVR Pit.
- > In Mammoth Lake, forecasted concentrations are expected to decrease over this period since there is no longer any release of treated water from the Whale Tail Mine site. Mammoth Lake shall only receive natural runoff water and water from the WTS Lake.
- > In Mammoth Lake, the forecasted concentrations shows generally a decreasing trend below the CCME guideline. This trend is generalized for all COCs, except for the following constituents: total Phosphorous, total Chromium and total Iron.

#### Comparison with 2021 Forecasted Values:

- > The WQF model forecasted concentrations are generally higher or in the same range as the forecasted values in last year's 2021 annual report, indicating that the model is conservative in its assessment.
- > Forecasted concentrations generally present a similar trend to the 2021 forecast. The forecasted concentrations are generally trending below CCME guideline in WTN Basin and Mammoth Lake, except for the following parameters: total Phosphorus, total Chromium and total Iron.
- > At the beginning of Closure, the WQF model estimated lower concentrations than the values presented in the 2021 Annual Report for the following constituents:
  - > In WT Pit / WTN Basin: Arsenic, Phosphorus, Manganese, Selenium, Zinc, Mercury, and Nitrate.
  - > In Mammoth Lake: Cupper, Manganese and Nitrate.

#### Comparison with FEIS assessment:

- > The WQF model forecasted concentrations are generally higher or in the same range as the forecasted values in the FEIS assessment values, indicating that the model is conservative in its assessment.
- > The WQF model forecasted concentrations have in general a similar trend than the forecasted values in the FEIS in both WTN Basin and Mammoth Lake.

### 4.3.3 During Post-Closure

Based on the water quality forecast modelling results during Post-Closure, the following key observations can be made:

#### Comparison to CCME guidelines:

- > The forecasted concentrations shows generally a stable trend below the CCME guideline in both WTN Basin and Mammoth Lake. This trend is generalized except for total Chromium, total Iron, total Copper and total Phosphorus which are trending higher than the CCME guidelines in both Mammoth Lake and WTN Basin.
- > The WQF model forecast a continued decreasing trend in the WTN Basin. This is to be expected since it shall continue to receive natural runoff, as well as water from the WTS Lake once the WT Dike is breached. Furthermore, water from WTN Basin shall be allowed to gravity flow toward Mammoth Lake.
- > The WQF model forecast an increasing trend in Mammoth Lake at Post-Closure. This is expected since at Post-Closure, it shall start to receive water from WTN Basin which contains higher concentrations of potential COCs once Mammoth Dike is breached. However, as mentioned above, the forecasted concentration in Mammoth Lake is trending below the CCME guidelines, except for Phosphorus, Chromium, Iron and Copper.

#### Comparison with 2021 Forecasted Values:

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- > The WQF model forecasted concentrations are generally higher than the forecasted values in last year's 2021 annual report, indicating that the model is conservative in its assessment.
- > Forecasted concentrations generally present a similar trend to the 2021 forecast. The forecasted concentrations are generally trending below CCME guideline in WTN Basin and Mammoth Lake.
- > However, some potential COCs showed a different trend than the 2021 forecast in Mammoth Lake:
  - > The forecasted concentration for Fluoride showed a decreasing trend in Post-Closure while the 2021 forecasted values showed an increasing trend. The same observation can be made for Selenium, Manganese and Arsenic. This could be due to the higher volume of runoff water considered in the 2022 WB.
  - > For Arsenic, the 2021 model indicate an increase in concentration up to the CCME limit during winter months due to cryo-concentration while the 2022 model show the same behavior, but the concentration values does not reach the CCME guideline.


Comparison with FEIS assessment:

- > The WQF model forecasted concentrations have in general a similar trend than the forecasted values in the FEIS in the WTN Basin and Mammoth Lake.
- > Some forecasted concentrations showed higher concentrations compared to FEIS values in Mammoth Lake only. It consists of Cadmium, Chromium, Copper, Iron, Manganese, Nickel, Selenium, Zinc, Phosphorous, Nitrate and Chloride.
- > Fluoride on the other hand shows an opposite behavior where the forecasted concentrations are lower than FEIS predicted values.

#### 4.3.4 Adaptive Management Plan

Breach of the dikes around the WTN basin shall only occur if the water quality meets site specific closure objectives. Water quality analysis shall continue to be taken during operation and closure period and the WQF model shall be updated accordingly.

If the results from the WQF model are forecasting trends that are deviating from what is anticipated, the adaptive management plan shall be activated. The adaptive measures that could be put in place include an increase in sampling frequency, identification of root cause of the deviation and implementation of a mitigation plan, and/or treatment of the water stored on site using the existing WTP.

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## 5.0 Conclusions

### 5.1 Results Summary

A Water Quality Forecast (WQF) model was developed based on the AEM 2022 Water Balance for the Whale Tail Mine site. The WQF model includes Operation, Closure and Post-Closure phases. The WQF model focused on providing forecasted concentration in Whale Tail and IVR Attenuation Ponds, Mammoth and Whale Tail South (WTS) Lakes and at Closure/Post-Closure, Whale Tail Pit (which becomes the Whale Tail North (WTN) basin at Closure).

Based on the FEIS Assessment and last year's 2021 annual report, the following Constituent of Concerns (COCs) were considered in this year's WQF model:

- > Total Arsenic;
- > Total Phosphorus;
- > The following total metals: Copper, Iron, Lead, Manganese, Mercury, Nickel, Selenium and Zinc;
- > Total Ammonia;
- > Nitrate;
- > Chloride; and;
- > Fluoride.

The key observations from this year's WQF model can be summarized as followed:

- > The WQF model estimated conservatively the concentrations for COCs during Operation, Closure and Post-Closure when compared to the values presented in the FEIS assessment and last year's annual report.
- > The WQF model generally forecast similar concentration trends over time for the COCs when comparing to FEIS assessment values.
- > Forecasted concentrations are generally higher or in the same range as the measured values on site.
- > All forecasted concentrations are below the Water Licence criterion for the COCs during Operation in WT and IVR Attenuation Ponds, except for Total Arsenic, Chromium, Iron and Total Phosphorus. The water from these ponds are treated at the Water Treatment Plant (WTP) prior to discharge to Mammoth or WTS Lakes. In 2022, the treated water met on average the Water Licence discharge criteria for Arsenic.
- > At Closure, all of the concentration of COCs in Mammoth Lake are forecasted to decrease over time since there is no longer any discharge of treated water to the lake.
- > At Post-Closure, many COCs are forecasted to increase in Mammoth Lake since WTN Basin shall be reconnected to Mammoth Lake once the WT and Mammoth Dikes are breached. However, most COCs are expected to remain below the CCME guidelines, except for Total Phosphorus, Total Chromium, Total Iron and Total Copper.

### 5.2 Recommendations

Based on the results of the WQF model, the model provides a conservative estimate of the evolution of COCs concentrations over time.

 <b>SNC • LAVALIN</b>	<b>TECHNICAL NOTE</b>		Prepared by: Ikram Elkhousmi		
	<b>Water Quality Forecast Update Based on 2022 WMP for Whale Tail Mine</b>		Reviewed by: Anh-Long Nguyen		
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In order to improve the accuracy of the model so that it can better forecast the concentration of the COCs in the WT and IVR Attenuation Ponds, WT Pit and in Mammoth and WTS Lakes, the following studies, tests and monitoring are recommended:

- > Continue to monitor water quality in the Attenuation Ponds and Mammoth and WTS Lakes with a specific focus on the following contaminants: As, P, F, Cr, Se, Mn, Fe.
- > Continue to monitor the water quality collected from the Whale Tail and IVR open pits.
- > To better understand the loading of potential COCs from the exposed pit wall during Operation and following Closure, determine if it is possible to sample the pit wall runoff safely. Consider advancing the hydrogeological model and understanding of the pit wall lithology to assess the potential loading of COCs during Operation and Closure.
- > A robust water quality sampling plan shall need to be developed for Closure and Post-Closure. Areas to sample include WT Pit, IVR Pit, WT Attenuation Pond and the WTN Basin once all of these ponds are hydraulically connected. Once the WTN Basin is formed, it is recommended to sample the surface water in different areas in the basin as well as different depths to gain a better understanding on the hydraulic behavior of this basin.

 <b>SNC • LAVALIN</b>	<b>TECHNICAL NOTE</b> <b>Water Quality Forecast Update Based on 2022 WMP for Whale Tail Mine</b>	Prepared by: Ikram Elkhousmi Reviewed by: Anh-Long Nguyen		
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## 6.0 References

AEM 2022a. Water Balance Update for 2022 Water Management Plan, file AMQ\_WaterBalance\_Annual Report.xlsx. Jan. 20, 2023.

Golder 2022. Whale Tail Project 2021 Annual Report – Closure and Post-Closure Water Quality Predictions, 21508120-552-RPT-Rev0, Mar. 31, 2022.

SNC 2021. Amaruq Water Balance and Quality Forecast Tool User Manual, document no. 677935-0000-40ER-0001, revision 00. Dec. 20, 2021.

FWQG. 2022. The Federal Environmental Quality Guidelines for Aluminium .



# Appendix 1

## Figures of Forecasted Concentration for Potential Constituents of Concerns during Operation

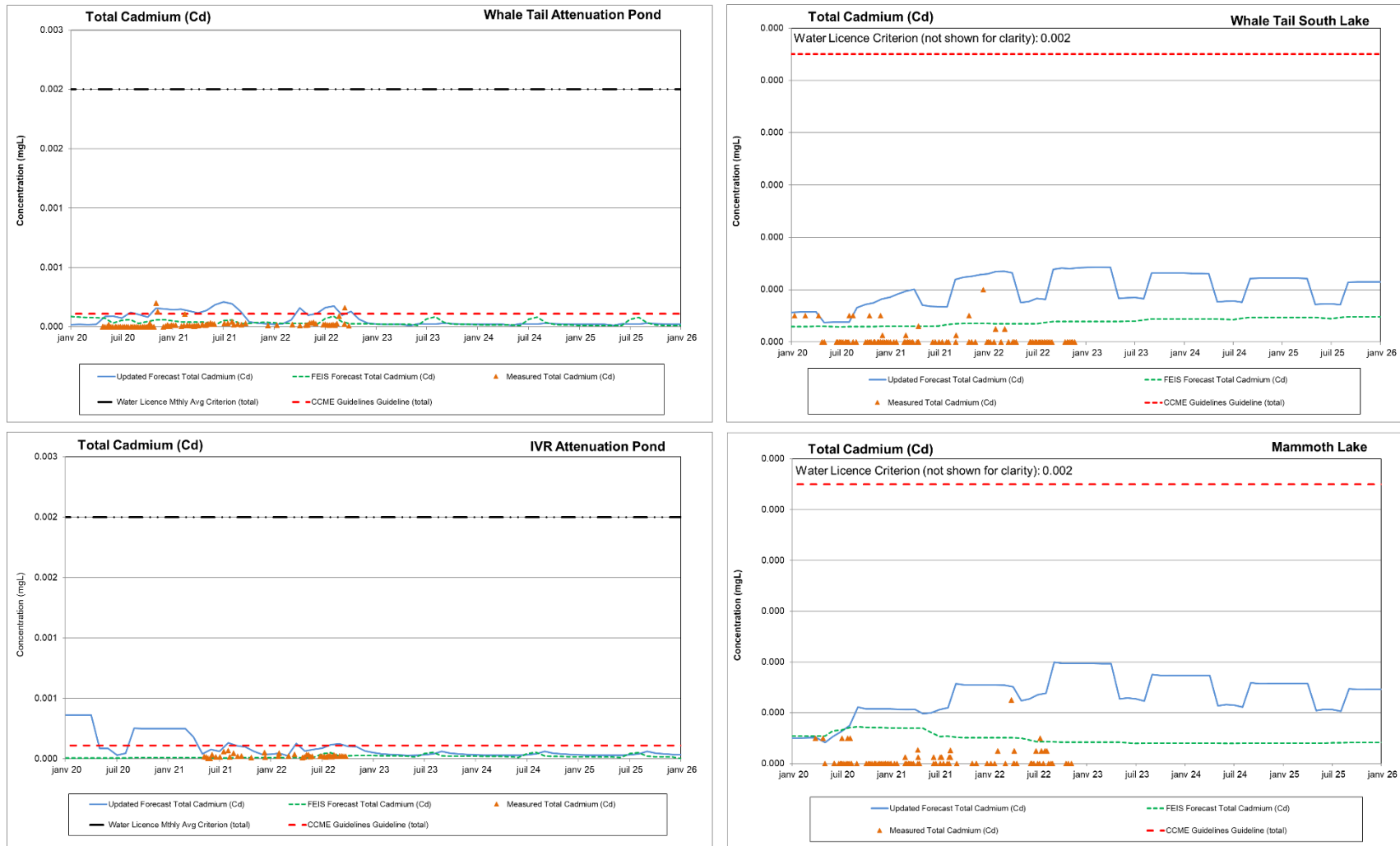


Figure A-1: Total Cadmium Forecasted Concentrations during Operation



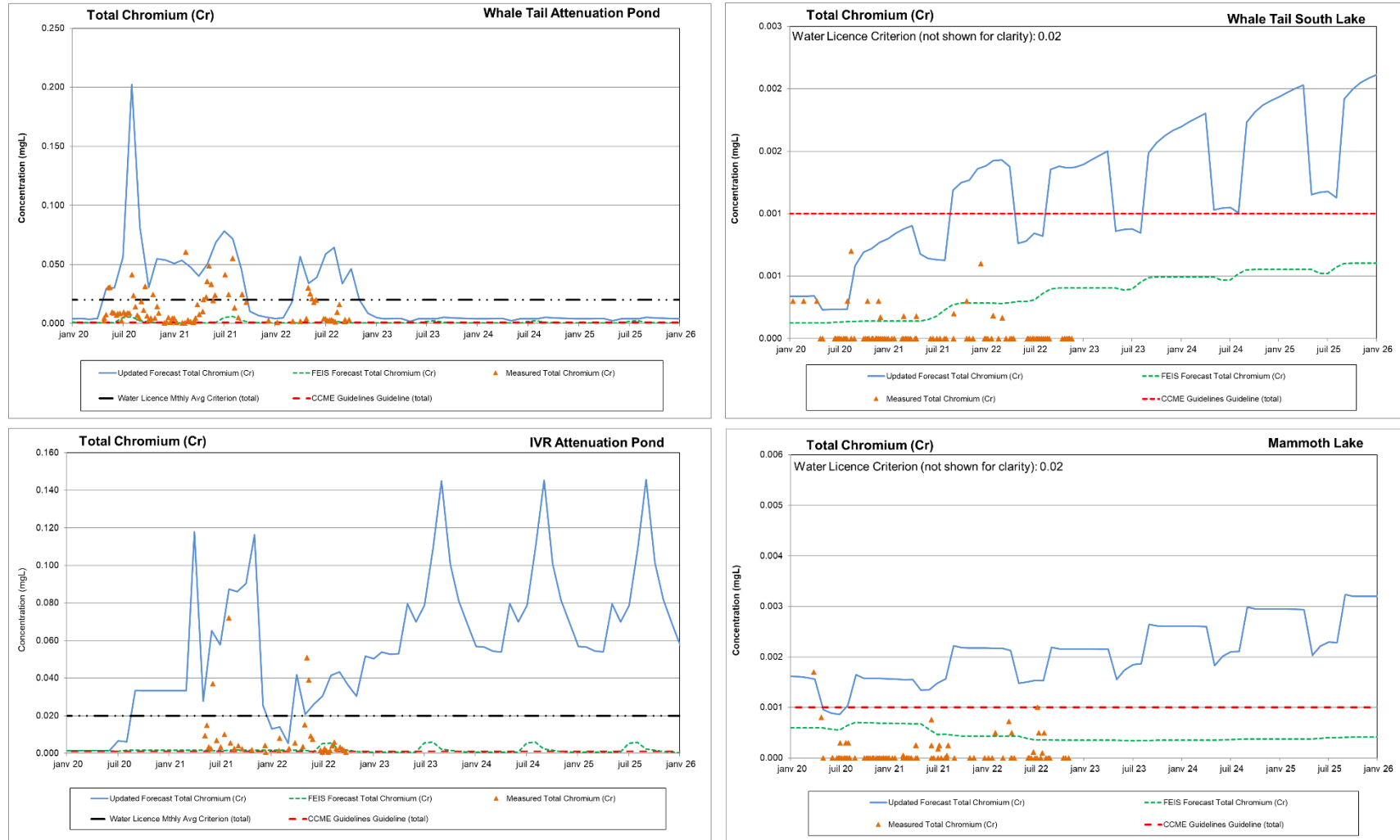


Figure A-2: Total Chromium Forecasted Concentrations during Operation

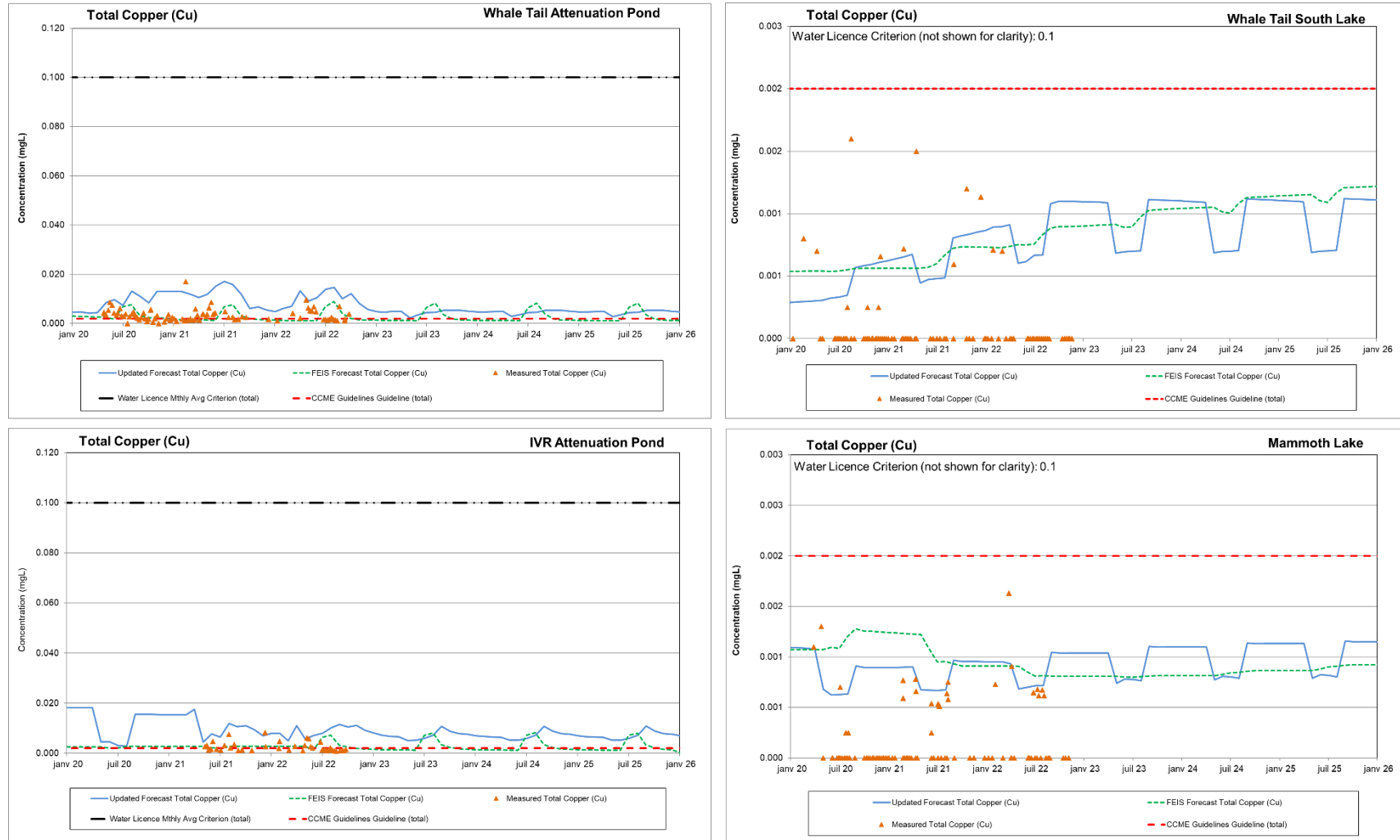


Figure A-3: Total Copper Forecasted Concentrations during Operation

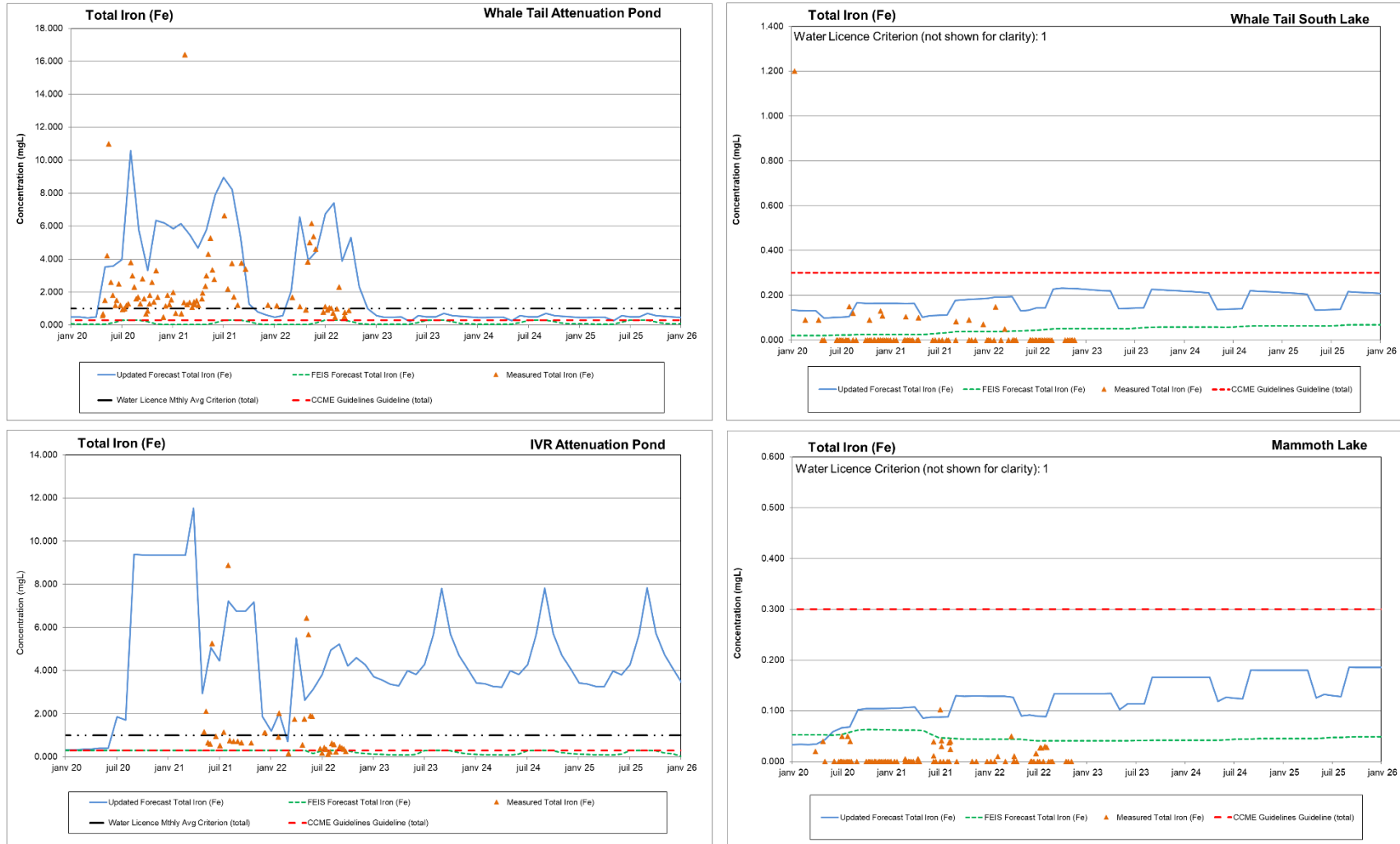


Figure A-4: Total Iron Forecasted Concentrations during Operation

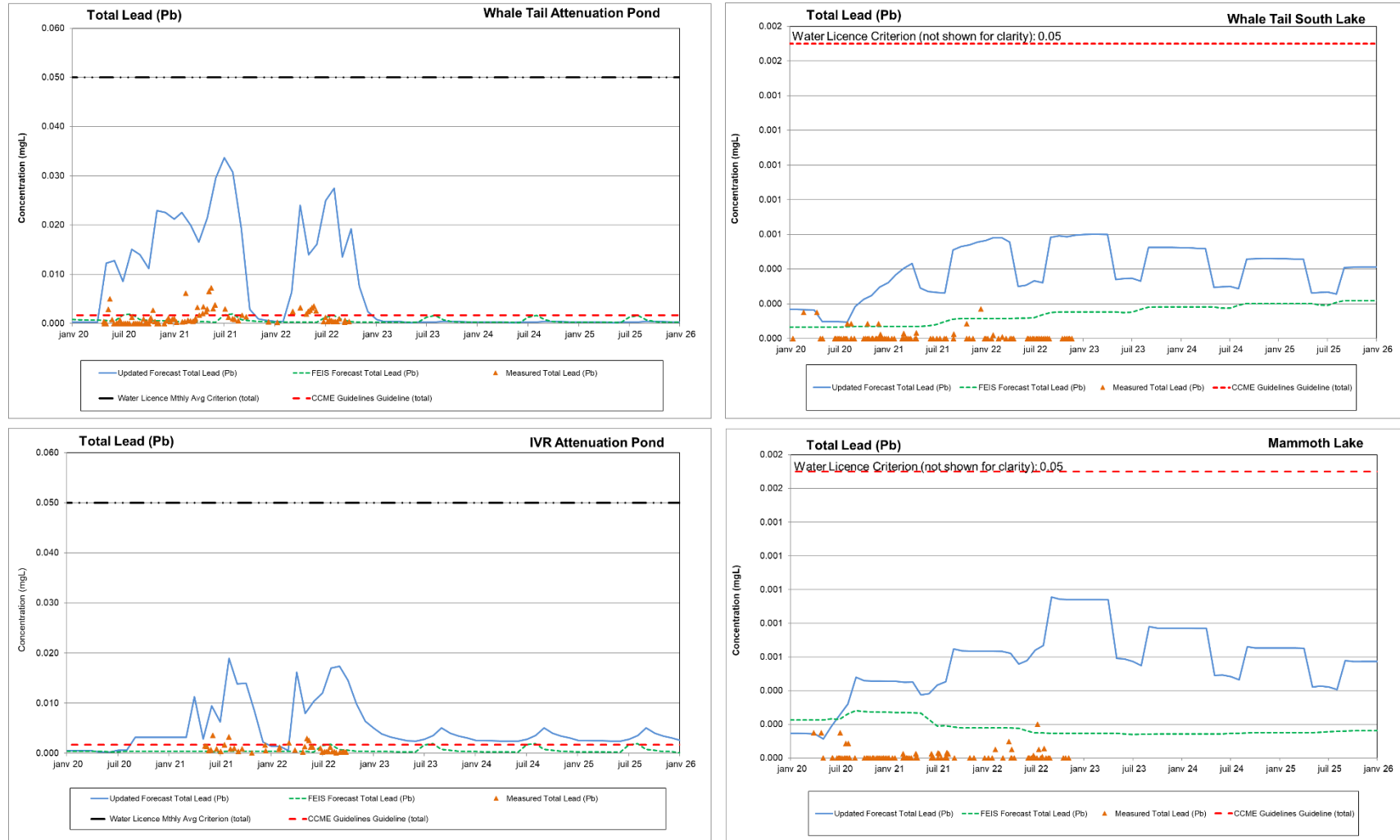


Figure A-5: Total Lead Forecasted Concentrations during Operation

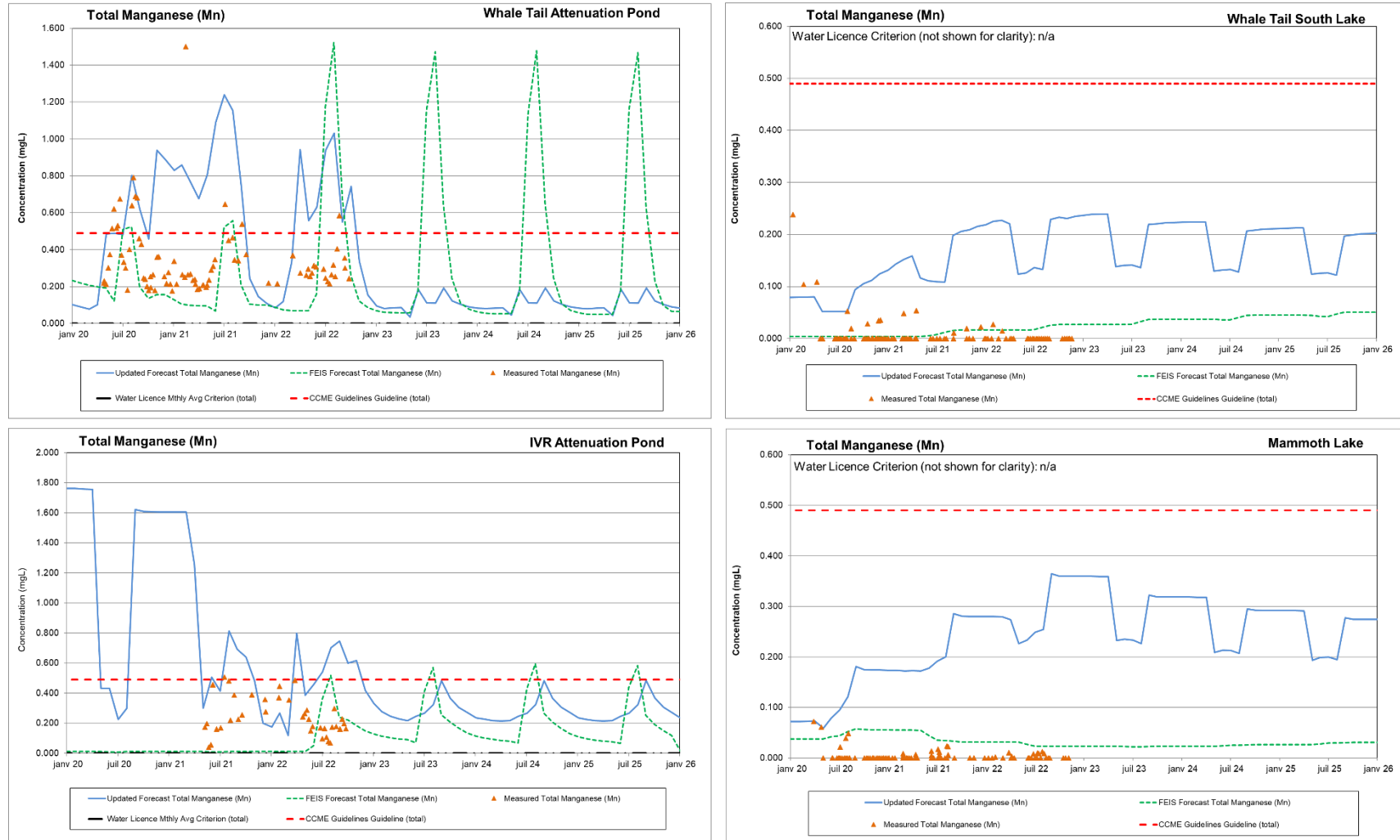


Figure A-6: Total Manganese Forecasted Concentrations during Operation

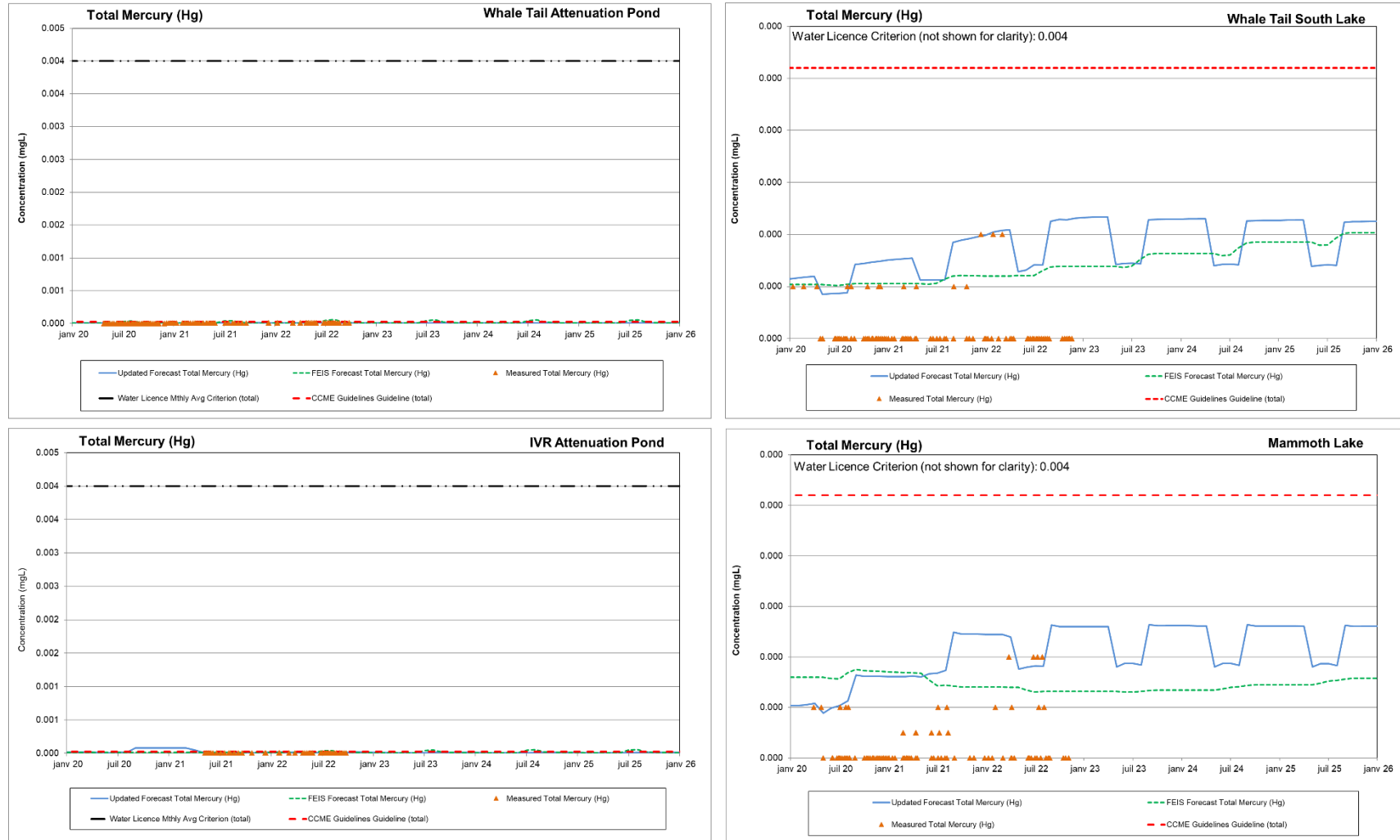


Figure A-7: Total Mercury Forecasted Concentrations during Operation

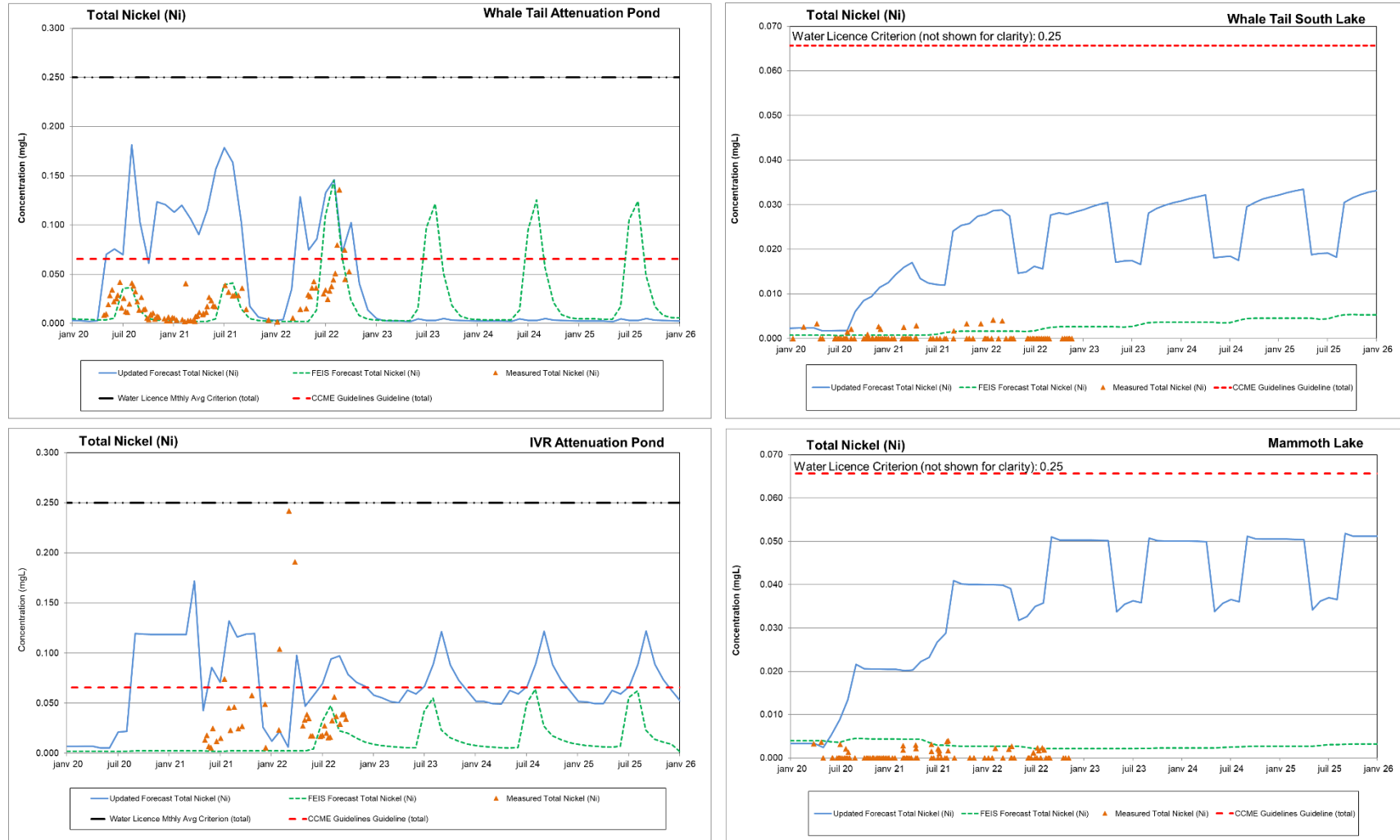


Figure A-8: Total Nickel Forecasted Concentrations during Operation

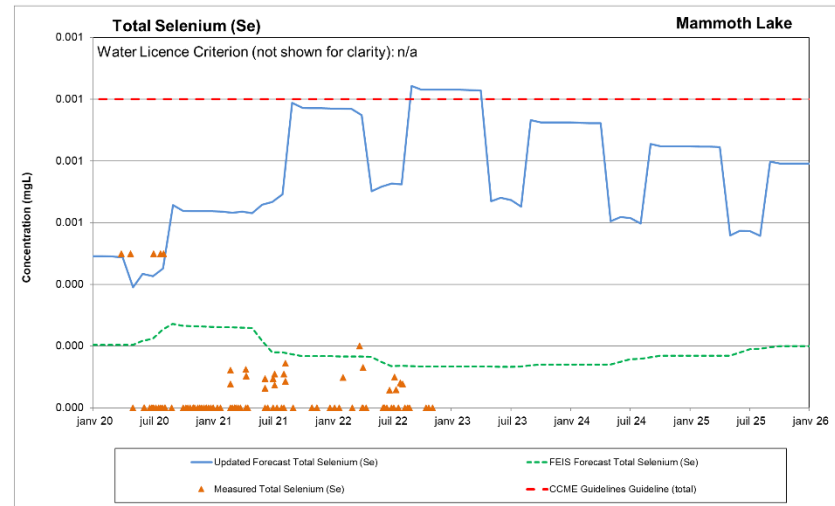
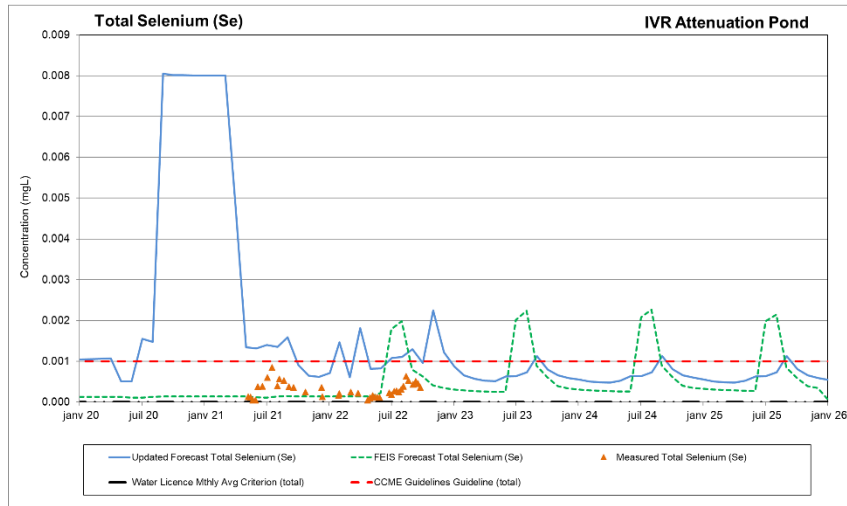
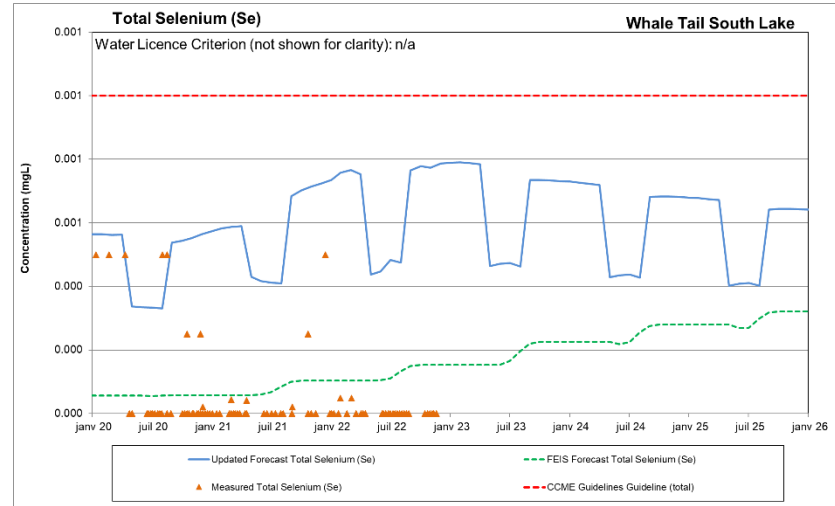
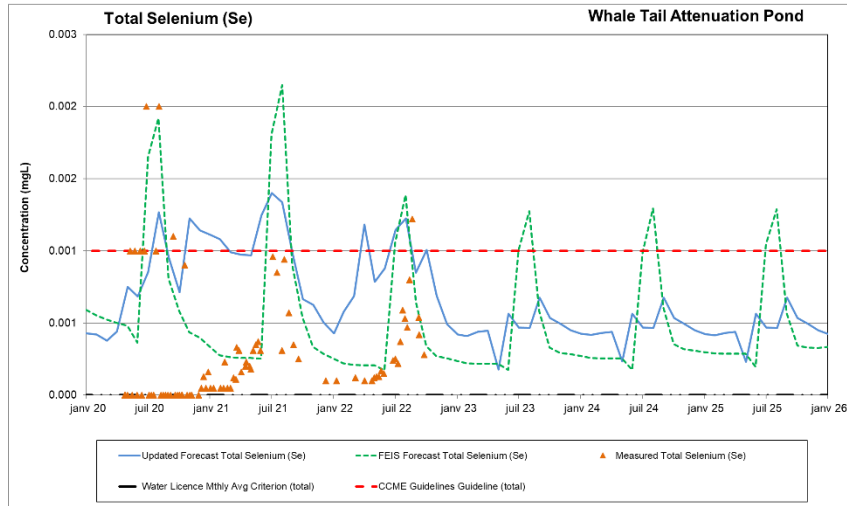


Figure A-9: Total Selenium Forecasted Concentrations during Operation.



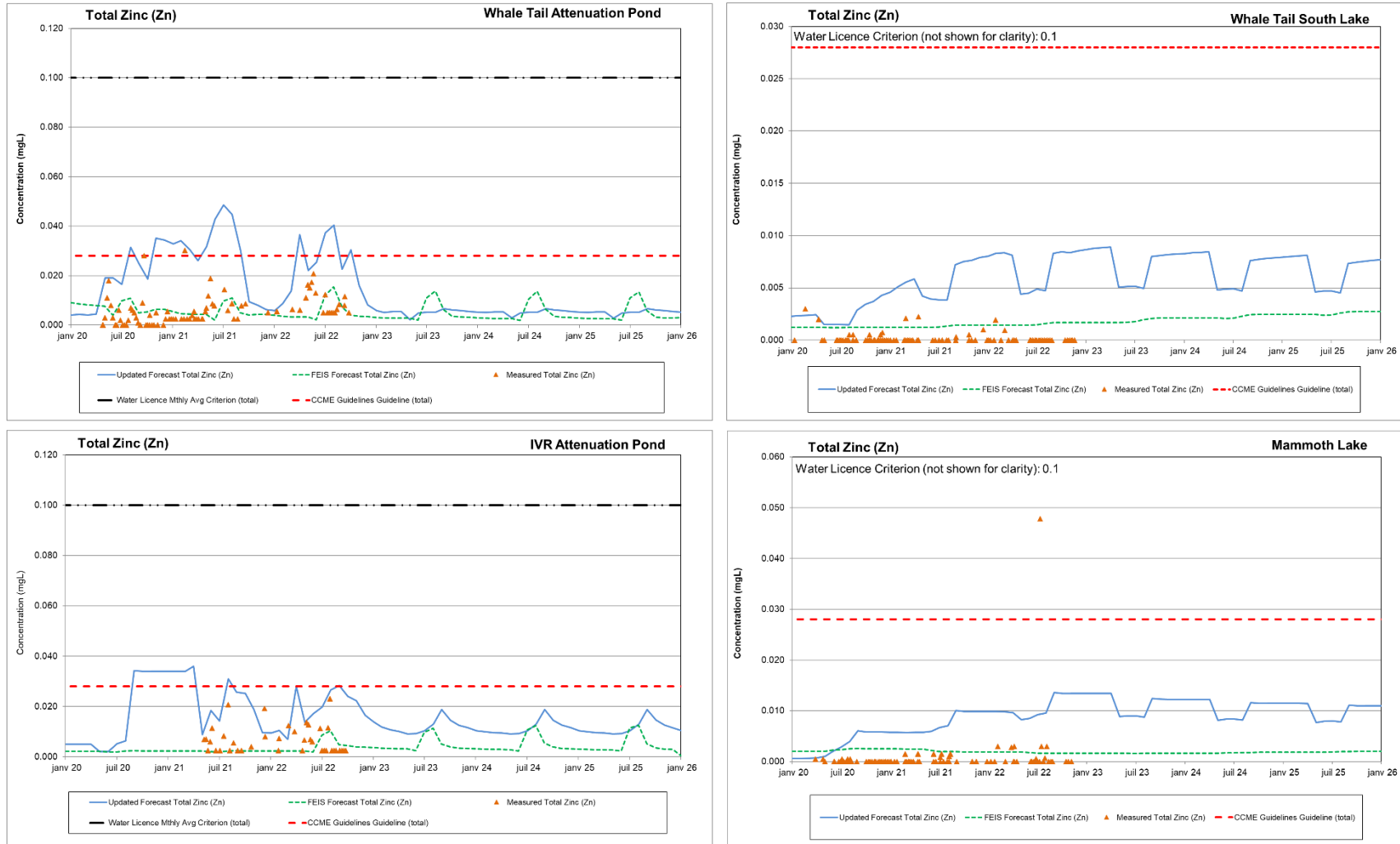


Figure A-10: Total Zinc Forecasted Concentrations during Operation

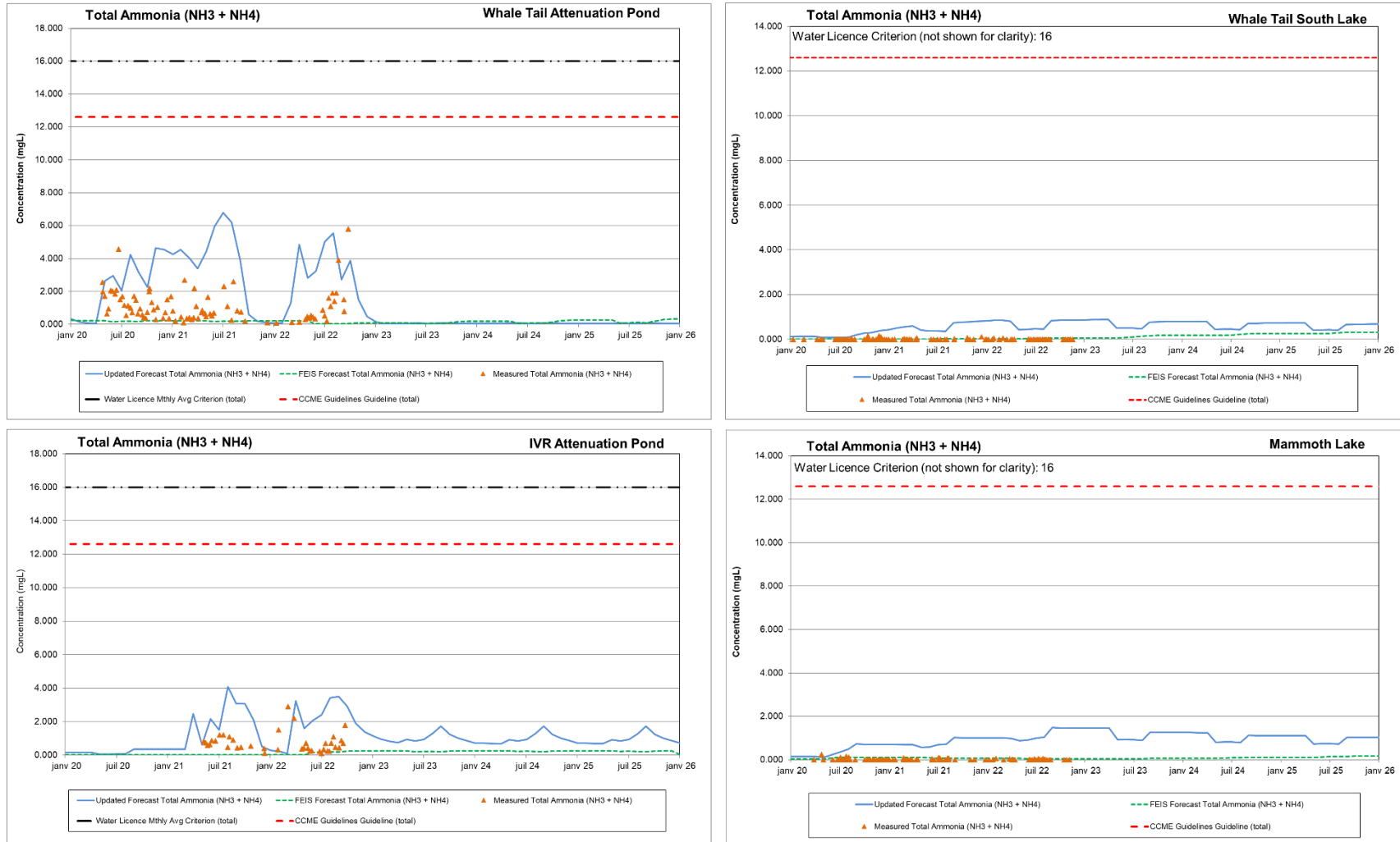


Figure A-11: Total Ammonia Forecasted Concentrations during Operation

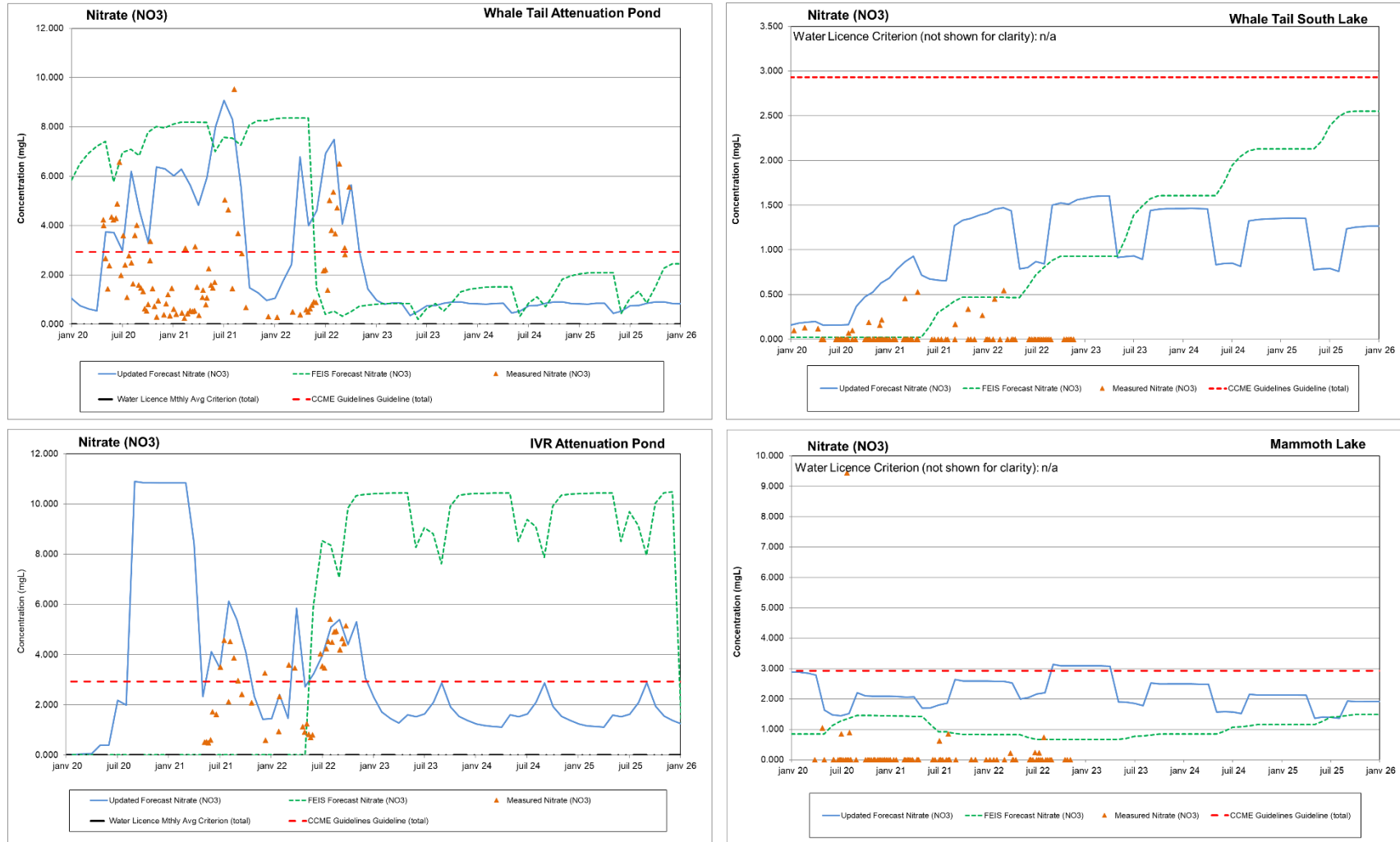


Figure A-12: Nitrate Forecasted Concentrations during Operation

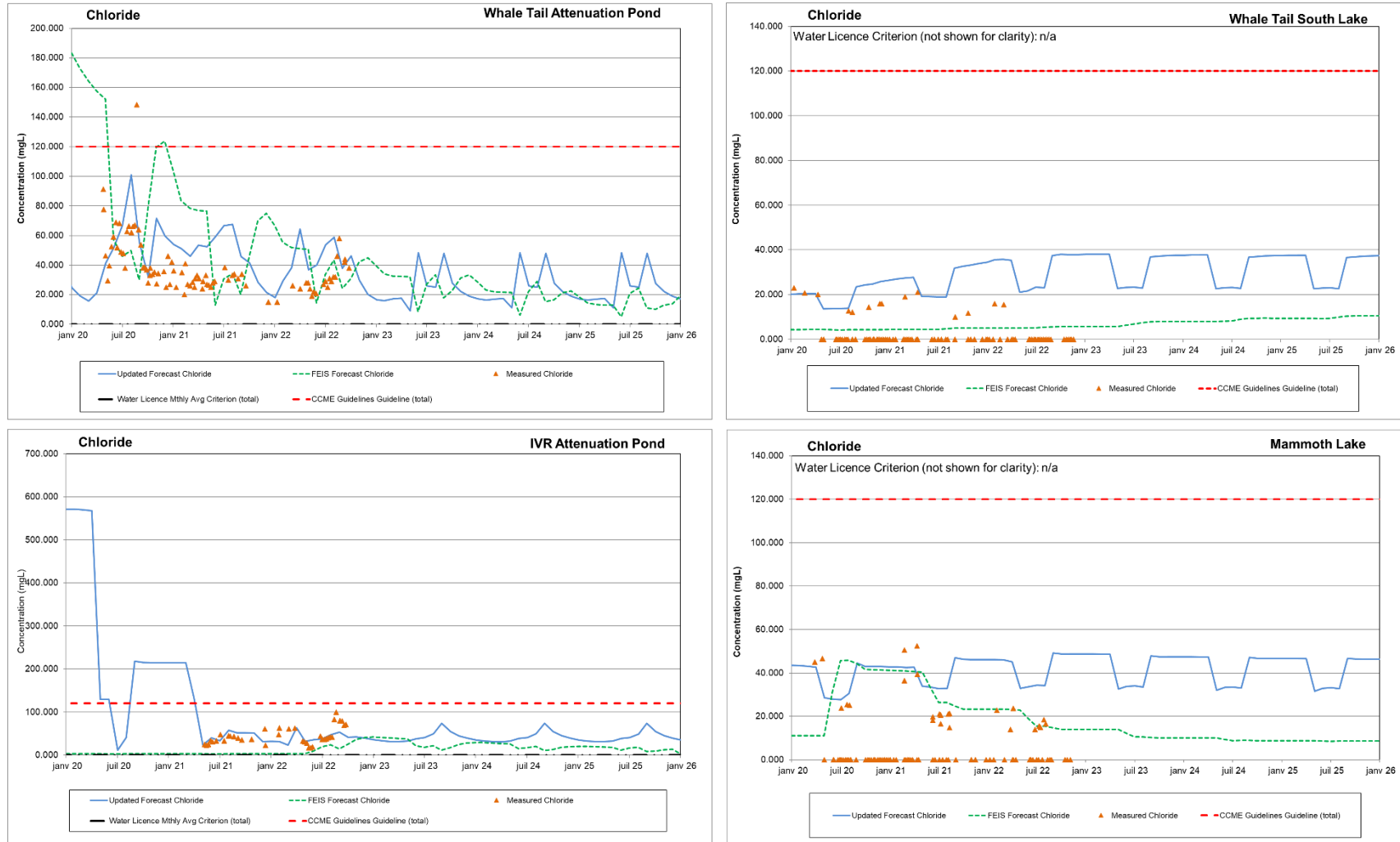


Figure A-13: Chloride Forecasted Concentrations during Operation

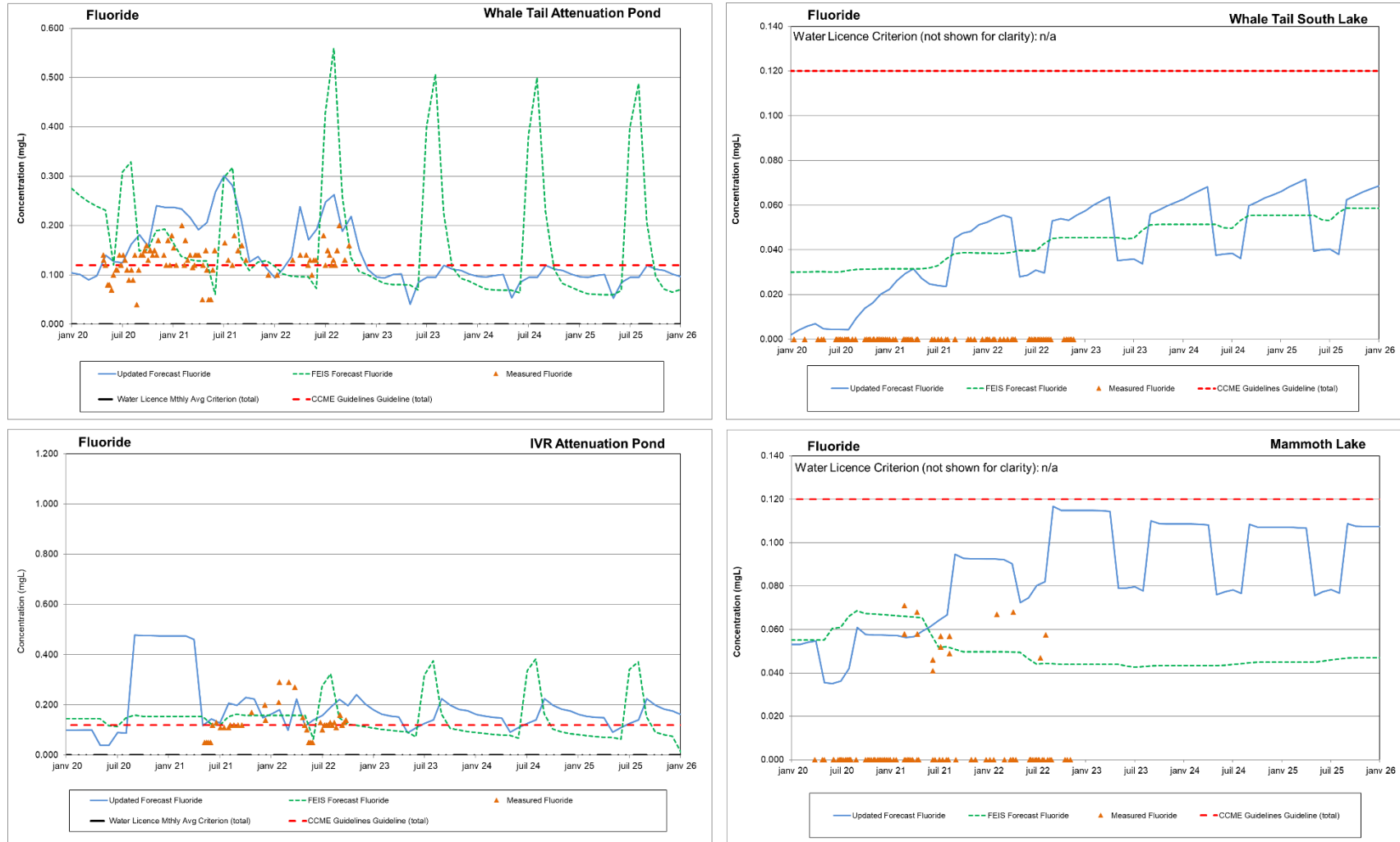


Figure A-14: Fluoride Forecasted Concentrations during Operation

**APPENDIX E • 2023 FRESHET ACTION PLAN**

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**AGNICO EAGLE**

**MEADOWBANK COMPLEX**

**WHALE TAIL FRESHET ACTION PLAN**

**MARCH 2023**

**VERSION 5**

## EXECUTIVE SUMMARY

The purpose of this Freshet Action Plan is to identify areas of concern around the Whale Tail Mine and the associated Hauling road needing to be managed in an organized and timely manner during the annual freshet period to prevent adverse environmental and operational impacts. The Plan outlines specified actions that will be taken by Agnico to manage and mitigate areas where environmental incidents could occur, as well as addressing historical incidents, specifically the WRSF dike seepage.

The freshet period is typically initiated during the annual snow and ice melt sometime around mid-May. During this period excess water is created and must be managed through additional pumping and management practices at vulnerable areas around the site. Mitigation techniques, timeframes and specified roles and responsibilities are outlined in this document for each area of concern.

The main areas of concern are the mining pit, the WT WRSF surrounding and pond, the IVR WRSF, the Whale Tail Attenuation Pond, the IVR attenuation Pond, the South Whale Tail Diversion Channel, and the IVR Diversion Channel.

It is important for all water management and associated infrastructure to be in good working order and adequate to manage the expected water flows associated with the freshet period; this includes but is not limited to pumps, ditch, culvert and sump maintenance, critical piping system installation and inspection, as well as adequate resource allocation for preparative work. A summary of the 2023 preparation works and roles and responsibilities is presented in the attached Appendix 1 (2023 Freshet Action Plan Procedures). Appendix 1 will be updated yearly to reflect changes in conditions at the Whale Tail site.



## DOCUMENT CONTROL

#	Revision			Pages Revised	Remarks
	Prep.	Rev.	Date		
01	Agnico	Internal	March 2019	All	Initial Version
02	Agnico	Internal	March 2020	All	Comprehensive update from 2019 plan
03	Agnico	Internal	March 2021	All	Comprehensive update from 2020 plan to include IVR infrastructures
04	Agnico	Internal	March 2022	All	Comprehensive update from 2021 plan
05	Agnico	Internal	March 2023	2	Figure 2-1 was updated
				5	Included the new pads that were built in 2022
				6	Section 2.13 was added to include the east and west abutment
				Appendix 2	Included a 2023 version
				Appendix 3	Included a 2023 version - Modifications with the pit transfers

Prepared By: Meadowbank Environment

Approved by:



Eric Haley

Environment & Critical Infrastructure Superintendent

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## 1 INTRODUCTION

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The purpose of the Whale Tail (WT) Freshet Action Plan is to ensure that Agnico can address and manage excess water associated with the freshet season at the Whale Tail site, and to ensure Agnico has implemented specific management and mitigation measures in response to environmental incidents with potential for off site impacts to water or land.

The freshet season is loosely defined as starting approximately May 15<sup>th</sup>, and in some cases, actions and mitigation measures can extend up to early fall when freezing re-occurs. There are many areas around the site that are vulnerable to excess water; the goal is to identify these areas and develop a clear plan with defined roles and responsibilities (amongst Agnico departments), and to manage the freshet flows.

In addition, several guiding principles are applicable to the formation of this plan. The highest priority principles are:

- 1) to ensure that the health and safety of Agnico employees is protected, especially with respect to mining operations when excess water is present;
- 2) to ensure that mine contact water from runoff or seepage is managed to prevent adverse environmental impacts; and
- 3) to make sure the site is in compliance with the Nunavut Water Board (NWB) License, Part D, Item 21 and Part E, Item 11.

The plan will identify the areas of concern and discuss the potential risks as well as mitigation measures necessary to address the identified issues. The overall site footprint has increased, and experience needs to be gained in identifying key location; lessons learned from the Meadowbank site will provide the necessary guidance. Appendix 1 contains the defined 2023 procedures, the roles and responsibilities and associated timelines. Agnico's intent is to update the Procedural Appendix on a yearly basis. There may be additional mitigation measures for a defined problem area or in some cases a previously defined issue may be permanently rectified.

The main areas of concern are:

- Mining pits and pit walls;
- Whale Tail WRSF and WRSF pond;
- IVR WRSF;
- South Whale Tail Diversion Channel;
- IVR Diversion Channel;
- Whale Tail Attenuation pond;
- Whale Tail Dike Seepage;
- IVR Attenuation Pond;
- WT Fuel Tank farms;
- Haul road culverts and bridges;
- Pads and roads built since 2022;
- Underground WRSF;and
- Whale Tail Dike East and West Abutment.

Each area identified above will be discussed in detail below. All areas of concern are considered priorities based on the guiding principles.

## 2 AREAS OF CONCERN

Table 2-1 View of Whale Tail Areas



## 2.1 MINING PITS AND PIT WALLS

All ramps, jump ramps, ditches and sumps must be cleaned of all ice and snow before May in order to contain any water resulting from the snow melt. All allocated pumps must be checked and serviced before the month of May. In addition, a check must be completed confirming that all piping systems starting from the different pits leading to the Whale Tail attenuation pond are free of ice, or any obstruction.

The water management strategy for the pits will be to send water from the WT Pit and IVR Pit area to either the WT Attenuation Pond or the IVR Attenuation Pond.

- A sump and ditch system is used to manage runoff water within the pit footprints. The infrastructures location will be modified or added as required based on the mining sequence.
- Sumps outside of the pit footprint are planned to prevent runoff from reporting to the Pit and to prevent water from ponding against the pit crest;
  - At WT Pit this includes the sumps located at the downstream area of Mammoth Dike and the North-West sump;
  - At IVR Pit this include the sump located in former Lake A47 (A47-S sump) and in the Northern area of IVR Pit (A47-N sump).

## 2.2 WHALE TAIL WASTE ROCK STORAGE FACILITY

Runoff from the Whale Tail Waste Rock Storage Facility (WT WRSF) is collected by 5 sumps (WT WRSF 1,2,3,4 & 5) as well as the WRSF pond delimited by WRSF Dike. Water from these sumps is pumped to the WRSF Pond and the WRSF Pond water is pumped to the WT Attenuation Pond or IVR Attenuation Pond.

The WT WRSF will require weekly inspections around the perimeter beginning as soon as the freshet starts (May) until freeze up to identify any seepage. In the event that seepage is observed from the WT WRSF, it must be reported to the Environment Departments and samples must be taken to determine the water quality and source. A mitigation plan will be prepared and implemented if necessary. Based on field observation, it may be deemed necessary to remove snow accumulation in the sumps around the WT WRSF to mitigate risk of snowmelt reporting to the surrounding environment. Runoff originating from the WT WRSF ultimately ends up in the WT WRSF pond. In August 2019, seepage from this pond was found to have reported through the WRSF Dike to the Mammoth lake. Remediation measures put in place in 2020 demonstrated to be successful. Daily inspections of the WRSF Downstream Pond will be required to confirm no seepage is occurring. A pump must be available in this location to pump any water potentially seeping through the structure back into the WRSF Pond.

## 2.3 IVR WASTE ROCK STORAGE FACILITY

Runoff from the IVR Waste Rock Storage Facility (WRSF) is collected by 5 sumps (IW A,B,C,D,E). Water from these sumps is sent to the IVR Attenuation Pond either by pumping or by gravity.

The IVR Waste Rock Storage Facility (IVR WRSF) will require weekly inspections around the perimeter beginning as soon as the freshet starts (May) until freeze up to identify any seepage and ensure that the gravity flow to the IVR Attenuation Pond are occurring as planned. In the event that



seepage is observed from the IVR WRSF, it must be reported to the Environment Departments and samples must be taken to determine the water quality and source. A mitigation plan will be prepared and implemented if necessary. Based on field observation, it may be deemed necessary to remove snow accumulation in key locations around the IVR WRSF to mitigate risk of snowmelt reporting to the surrounding environment.

## **2.4 SOUTH WHALE TAIL DIVERSION CHANNEL**

The South Whale Tail Diversion Channel was constructed in 2020. In early May, partial snow removal will be required in this infrastructure to form a preferential water path and prevent snow blockage. Daily inspection at the start of freshet will be required until freshet is completed and following rain events, to ensure no contaminant is transported into Mammoth Lake. Turbidity barriers were left in place at the end of the previous summer to secure subsequent freshets. Barrier inspection will be required to ensure they perform as intended.

## **2.5 IVR DIVERSION CHANNEL**

The IVR Diversion Channel was constructed during the fall of 2020. The IVR Diversion Channel serves to divert the watershed reporting to the IVR Pit towards the C-Watershed. This will reduce the amount of contact water to manage on site. In early May, partial snow removal will be required in this infrastructure to form a preferential water path and prevent snow blockage. Daily inspection at the start of freshet will be required until freshet is completed and following rain events, to ensure no contaminant is transported into the surrounding environment. Additional mitigation measures may be required, based on field observations.

## **2.6 WHALE TAIL ATTENUATION POND**

The Whale Tail Attenuation Pond is the secondary contact water management basin on site. Contact water from surrounding infrastructure is pumped to the pond. From there, Whale Tail Attenuation Pond water can be pumped to either the IVR Attenuation Pond or the AsWTP, for treatment, if required, and discharge to approved final effluent locations within Whale Tail South or Mammoth lake. A 10-day notice prior to changing effluent discharge locations must be submitted to CIRNAC. The plant's treatment abilities were designed to remove TSS and arsenic. All piping and the discharge diffuser must be inspected prior to freshet, in order to have all installations in place to proceed with pumping and/or treatment activities during freshet. The pond water levels will be managed closely and inspected regularly.

## **2.7 WHALE TAIL DIKE SEEPAGE**

Water from the Whale Tail Dike seepage is reporting to the WT Attenuation Pond through either a pumping system or by gravity. If water quality criteria are met, it is possible for the system to discharge directly to WTS, a 10-day notice to ECCC would be required. The system is not expected to be put in operation due to the current water quality.

## **2.8 IVR ATTENUATION POND**

The IVR Attenuation Pond is the main contact water management basin on site. Contact water from surrounding infrastructure is pumped to the pond. From there, water can be discharged to approved final effluent locations within Whale Tail South or Mammoth lake, or may be sent to the AsWTP, for

treatment, if required, prior to discharge. A 10-day notice prior to changing effluent discharge locations must be submitted to CIRNAC. The plant's treatment abilities were designed to remove TSS and arsenic. All piping and the discharge diffuser must be inspected prior to freshet, in order to have all installations in place to proceed with pumping and/or treatment activities during freshet. The pond water levels will be managed closely and inspected regularly.

## **2.9 WHALE TAIL FUEL TANK FARMS**

The main fuel farm containments were built in 2019, and will be monitored throughout freshet. Snow and ice accumulation within the fuel tank farms must be adequately managed to prevent overflow to the environment and/or damage to the fuel handling systems. The Energy and Infrastructure Department will advise the Environmental Department of their intent to pump the containment area once ice/snow begins to melt. Water samples will be taken in accordance with the Water License to ensure compliance prior to its release. A notice must be provided to the CIRNAC Inspector 10 days prior to this pumping activity. Once sample results have been obtained, the Environmental Department will advise the Energy and Infrastructure Department. If sample results permit, the pumping may begin to direct water to the tundra/ground in a way to prevent erosion. The volume of water pumped from secondary containment(s) will be track by the Energy and Infrastructure Department and/or Environment Department. In the event that the water sample results do not meet discharge criteria the water could be trucked in a tanker and transported to the Meadowbank site to be disposed of in the TSF.

## **2.10 HAUL ROAD CULVERTS AND BRIDGES**

Daily inspections will be undertaken starting in May at all culverts and bridges along the Haul road to ensure that water during freshet is flowing freely and no erosion is occurring. If elevated TSS/Turbidity levels are observed sampling will occur and the results assessed. Turbidity barrier will be installed if required. The Mine department will also be advised if severe erosion/scouring is observed. In addition, snow and ice removal may be required to allow the water to flow as per design specifications. Daily inspections will be performed during the freshet period by the Environment department.

## **2.11 2022-2023 PAD CONSTRUCTIONS AND ROAD CULVERTS**

Weekly inspections at the start of snowmelt will be required to monitor for potential erosion and sediment transport. Mitigation measures may be required to minimize transport of sediments towards water bodies. See below for a list of such constructions:

- Underground Emulsion transfer pads;
- Nemo Lake pad;
- Mammoth Lake road; and
- Qamanittuaq SANA crusher pad.

In addition to the pads, some culverts around site drain towards water bodies. Daily inspections will be undertaken by the Environment Department starting in May for all culverts around the mine site to ensure the water during freshet is flowing freely and no erosion is occurring. If elevated TSS/Turbidity levels are observed sampling will occur and the results assessed. Turbidity control

equipment will be installed if required. Snow and ice removal may be required to allow the water to flow as per design specifications.

### **2.12 UNDERGROUND WRSF WATER COLLECTION SYSTEM**

The Underground WRSF Water Collection System was built in 2019 to collect any water running off the underground infrastructure, and direct runoff water into GSP1. Steaming of culverts may be necessary if snow or ice blockage are identified prior to the start of freshet. Weekly inspection will be required during freshet to validate operationality and liner integrity of collection system.

### **2.13 WHALE TAIL DIKE EAST AND WEST ABUTMENT**

In 2022-2023, two thermal berms at the East and West abutment of Whale Tail Dike were built to prevent water to ingress further in the abutment. Daily inspections of the East and West abutment of Whale Tail Dike will be monitored throughout freshet and following rain events. TSS control measures such as turbidity barrier may be installed at the abutments if required.

## **3 ADAPTIVE WATER MANAGEMENT STRATEGY**

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An Adaptive Water Management Plan was developed to document specific mitigation measures and associated management actions to be taken when specified thresholds are exceeded. Mitigation measures may include special studies, operational changes, revised or new water and waste management systems, structures and/or facilities, or implementing mitigation activities to prevent, stabilize or reverse a change in environmental conditions or to otherwise protect the receiving environment. The Adaptive Management Plan is to be reviewed periodically to account for the dynamics of mine construction and operation, and adjusted as needed.

Various level thresholds were identified for surface water management, based on the capacity of different water management infrastructure to retain water on site. The objective is to trigger management strategy actions based on the capacity of these structures. The main management response is based on increasing the discharge rate especially when water is meeting effluent discharge criteria.

## **4 SNOW MANAGEMENT**

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A snow management procedure has been developed internally in 2020 and will be updated annually. Refer to Appendix 2 for the snow management map. Temporary snow storage dumps and snow accumulation areas of concern were identified on a map. Removal will be managed accordingly.





## **APPENDIX 1**

### **2023 Freshet Action Plan Procedure**

Section	Area of Concern	Role/Action	Responsibilities	Dates
2.1 MINING PITS AND PIT WALLS				
2.1	Mining Pit and Pit walls - General	1) Clean all ice, mud and snow on all permanent ramps, jump ramps, etc.	Mine Operations	Before May
		2) Check and service all pumps.	E&I (Energy and Infrastructure) and Maintenance	Before May
		3) Check that all piping systems starting from the pit leading to the Attenuation ponds are free of ice by validating pumping values (if pumping systems active) and/or performing an air test in the pipe with a compressor.	E&I/Mine Operations	Before May
2.2 WHALE TAIL WASTE ROCK STORAGE FACILITY				
2.2.	WT WRSF Inspection	1) Weekly inspection around the WRSF perimeter to identify any seepage.	Env. Department	May - as soon as freshet starts until freeze up
		2) Pump if required from the WRSF periphery to WRSF Pond	E&I	May - as soon as freshet starts until freeze up
		3) If seepage observed notify Env Department AND sample for Water License Parameters.	Env. Department	May - as soon as freshet starts until freeze up
WRSF Pond		Daily inspection - keep record	Env. Department	May - until freshet complete

				and after rain events
		1) Maintain WRSF Pond as dry as possible	E&I	May - until freeze up
		2) Pump any water reporting to the WRSF downstream water collection system – Volumes required to be documented	E&I/Engineering	May - until freeze up
		3) Sample upstream and downstream	Env. Department	May - until freeze up
		4) Report any discharge of TSS to Mammoth Lake to ECCC/NWB (if grab > 30 mg/L).	Env. Department	May - until freshet complete and after rain events
<b>2.3 IVR WASTE ROCK STORAGE FACILITY</b>				
2.3.	IVR WRSF Inspection	1) Weekly inspection around the IVR WRSF perimeter to identify any seepage.	Env. Department	May - as soon as freshet starts until freeze up
		2) Pump if required from the IVR WRSF periphery to IVR attenuation pond	E&I	May - as soon as freshet starts until freeze up
		3) If seepage observed notify Env Department AND sample for Water License Parameters.	Env. Department	May - as soon as freshet starts until freeze up

2.4 SOUTH WHALE TAIL DIVERSION CHANNEL				
2.4	South Whale Tail Diversion Channel	1) Daily inspection - keep record	Env. Department	May - until freshet complete and after rain events
		2) Install mitigation measures, if needed (elevated TSS observed), and maintain	Env. Department	May - until freshet complete and after rain events
		3) Sample monitoring for TSS, if excess turbidity observed - use external lab.	Env. Department	May - until freshet complete and after rain events
		4) Report any discharge of TSS to Mammoth Lake to ECCC/NWB (if grab > 30 mg/L).	Env. Department	May - until freshet complete and after rain events
2.5 IVR DIVERSION CHANNEL				
2.5	IVR Diversion Channel	1) Daily inspection - keep record	Env. Department	May - until freshet complete and after rain events
		2) Install mitigation measures, if needed (elevated TSS observed), and maintain	Env. Department	May - until freshet complete and after rain events
		3) Sample monitoring for TSS, if excess turbidity observed - use external lab.	Env. Department	May - until freshet complete and after rain events

		4) Report any discharge of TSS to Mammoth Lake to ECCC/NWB (if grab > 30 mg/L).	Env. Department	May - until freshet complete and after rain events
2.6 WHALE TAIL ATTENUATION POND				
2.6	Whale Tail Attenuation Pond	1) Set-up pumping of the WT Attenuation Pond to prevent water from flowing into the pit area, keeping track of all daily volumes	E&I	At all time
		2) Notify Environmental Department before any environmental discharge.	E&I	At all time
		3) Inspect all piping and discharge diffuser	E&I	May
2.8 IVR ATTENUATION POND				
2.8	IVR Attenuation Pond	1) Set-up pumping of IVR Attenuation Pond through the AsWTP, keeping track of all daily volumes	E&I	At all time
		2) Notify Environmental Department before any environmental discharge.	E&I	At all time
		3) Inspect all piping and discharge diffuser	E&I	May
2.9 FUEL TANK FARMS				
2.9	WT Tank Farm	1) E&I Dept to advise Env Dept in advance of intent to pump once ice melts in containment area.	E&I and Env. Department	Probably mid-June and September

		2) Sample water in accordance with Water License to ensure compliance with limits prior to release.	Env. Department	Probably mid-June and September
		3) Provide notice to Inspector 10 days prior to pumping.	Env. Department	Probably mid-June and September
		4) Advise Energy and Infrastructure Dept if pumping can begin based on sample results.	Env. Department	Probably mid-June and September
		5) Pump to tundra/ground or Meadowbank TSF. <b>NOTE: The water cannot be pumped out to the tundra if it does not meet the Water License criteria.</b>	E&I	Probably mid-June and September
2.10 WHALE TAIL HAUL ROAD CULVERTS AND BRIDGES				
2.10	Recent pad and road constructions	1) Daily inspection of and bridges on the Whale Tail Haul Road	Env. Department	May and after rain events
		2) Sample for TSS and Turbidity if elevated TSS observed.	Env. Department	May - until freeze up
		3) Notify E&I Dept & the mine department if severe erosion/scouring observed - for repair action.	Env. Department	May - until freeze up
		4) Install mitigation measures if required.	Env. Department	May - until freeze up
2.11 RECENT PAD AND ROAD CONSTRUCTIONS				

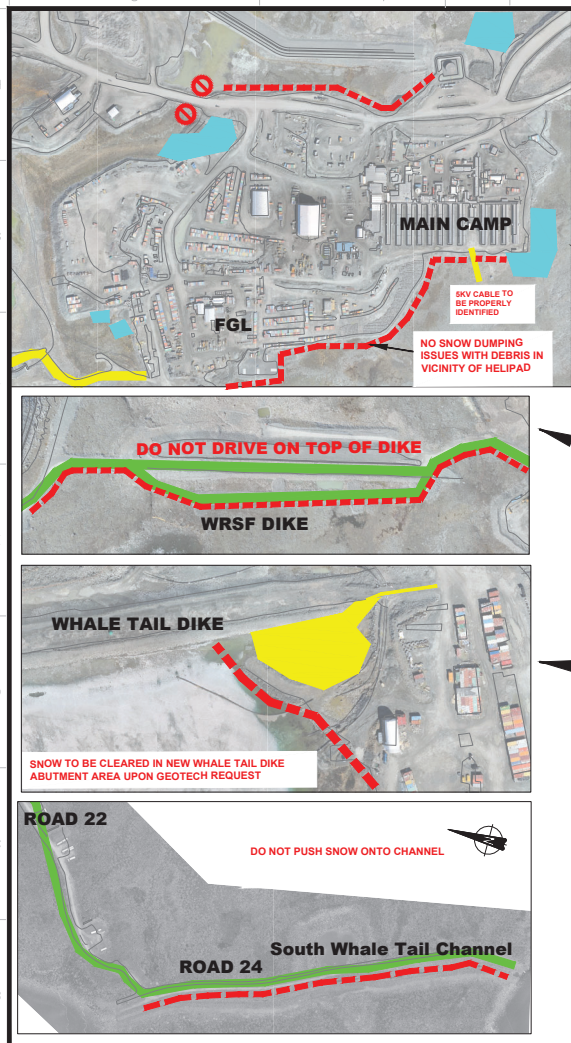
2.11	Recent pad and road constructions	1) Daily inspection of culverts around site (Road to emulsion plant, IVR access road)	Env. Department	May and after rain events
		2) Weekly inspection of toes of constructions built in the last year.	Env. Department	May and after rain events
		3) Sample for TSS and Turbidity if elevated TSS observed.	Env. Department	May - until freeze up
		4) Notify E&I Dept if severe erosion/scouring observed - for repair action.	Env. Department	May - until freeze up
		5) Install mitigation measures if required.	Env. Department	May - until freeze up




## APPENDIX 2

### 2022-2023 Snow Management Map





	DRAWN BY	T. DAHM/G. BARIL		DATE	2022-10-30		TITLE AGNICO-EAGLE — MEADOWBANK DIVISION GEOTECHNICAL REQUIREMENTS SNOW CLEARING MAP 2022-2023		
	CHECKED BY								
	APPROVED BY								
	PROJECT NO.								
	DATE			SCALE	N.T.S.		FILE	.DWG	
			DRAWING NO.				REVISION	SHEET 1 / 1	

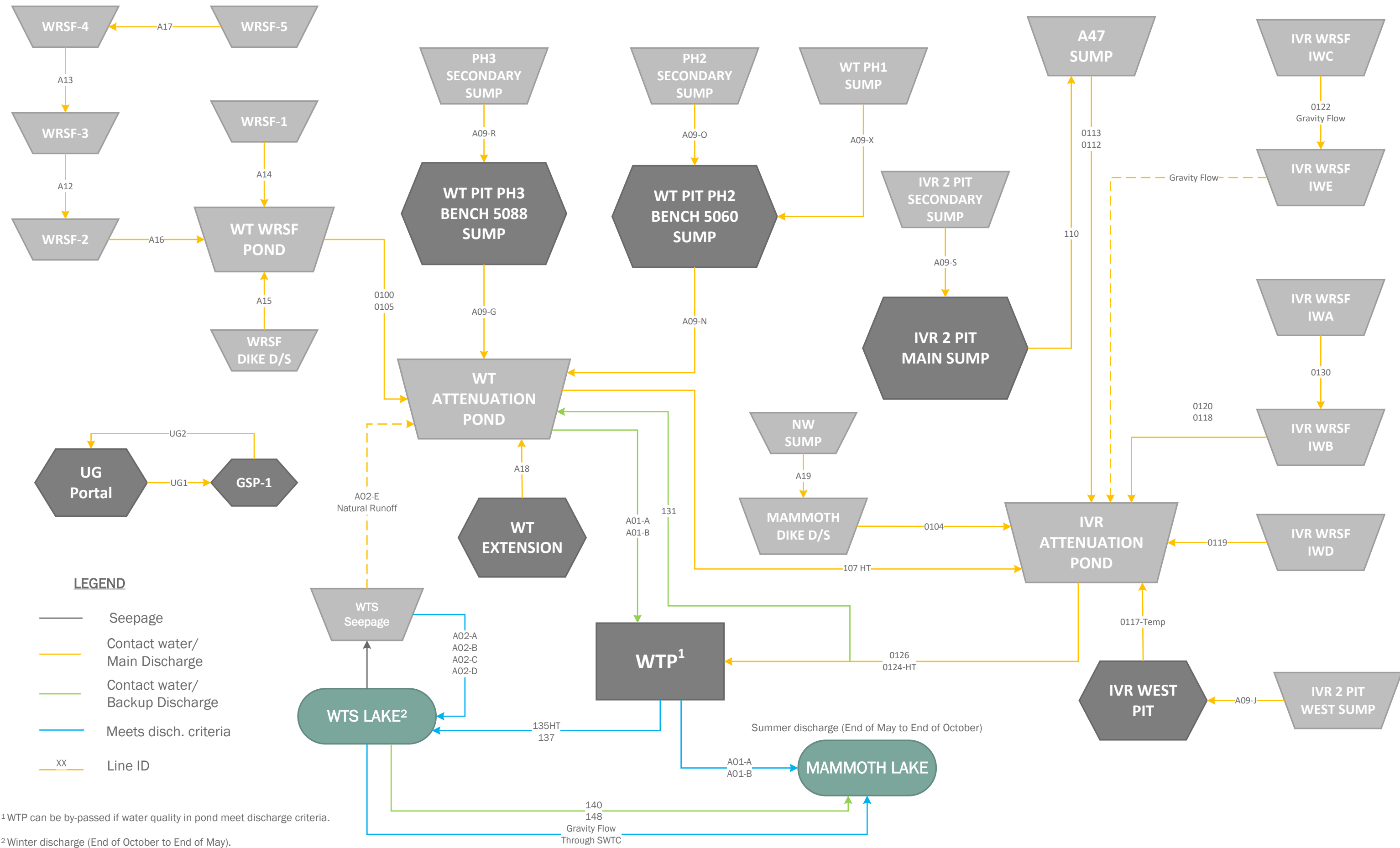


## APPENDIX 3

2023 Freshet flowchart and plan view

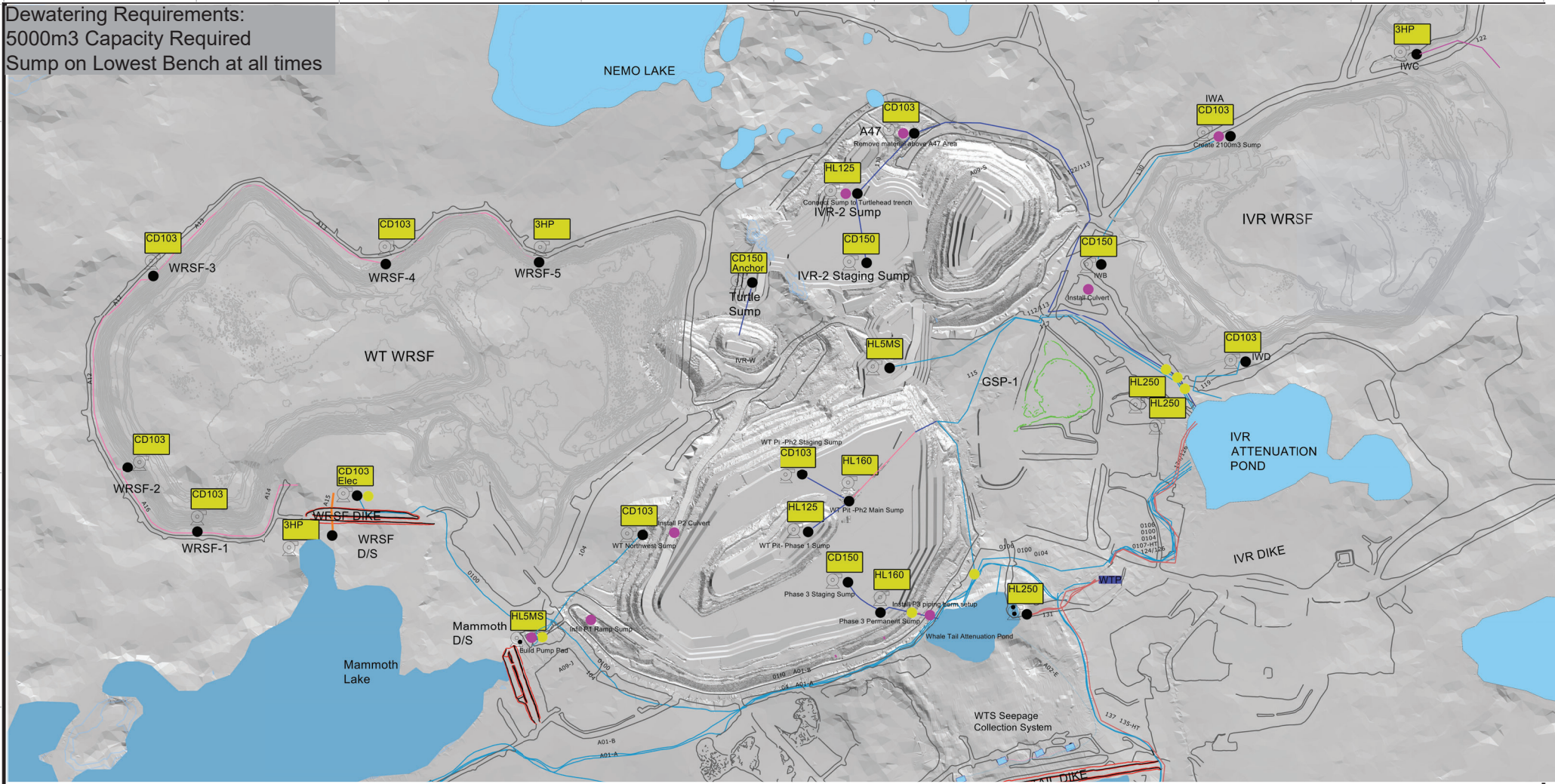
Whale Tail Mine 2023 Detailed Freshet Flowsheet

Updated by : C. Pelletier  
Date: 2022-03-25





Dewatering Requirements:  
5000m3 Capacity Required  
Sump on Lowest Bench at all times



LEGEND	Description	Color	Sump	Earthworks
	4" HDPE DR11	Pink	Black circle	Purple circle
	4" HDPE DR17	Yellow		
	4" Layflat	Orange		
	8" HDPE DR9	Blue		
	8" HDPE DR11	Red		
	8" HDPE DR17	Green		
	12" MineFlex	Cyan		
	14" HDPE DR11	Light Blue		
	14" HDPE DR17	Dark Blue		
			Yellow circle	Orange rectangle
				Pump Model

Pump	Required			On Site*	Surplus
	AMO	MSK	TOTAL		
3HP	3	11	14	18	4
HL250M	3	3	7	9	2
HL160M	3	0	3	4	1
HL125M	2	0	2	2	0
HL5MS	2	0	2	2	0
John Deere	0	0	0	1	1
CD150M	3	0	3	4	1
CD103M	9	3	12	14	2
CD103M-ELEC	1	2	3	4	1
CD100M	0	1	1	1	0
CD80	0	1	1	2	1
40HP	0	1	1	4	3
150HP	0	1	1	7	6



John Gage	DATE 2023-03-11
John Gage	DATE 2023-03-15
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TITLE		Whale Tail Mine Freshet 2023 Plan	
DATE			
SCALE 1:10000	3/21/2023	FILE	
DEPARTMENT	ENVIRONMENT	REVISION	SHEET 1 / 1