APPENDIX 28-9. WATER MANAGEMENT PLAN

AGNICO EAGLE

MELIADINE GOLD MINE

Water Management Plan

MARCH 2024

VERSION 14

6513-MPS-11

EXECUTIVE SUMMARY

Agnico Eagle Mines Limited (Agnico Eagle) is operating the Meliadine Gold Mine (the Mine), located approximately 25 kilometres (km) north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut. The Mine Plan proposes open pit and underground mining methods for the development of the Tiriganiaq gold deposit, with two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) and one Underground Mine.

The water management objectives are to minimize potential impacts to the quantity and quality of surface water at the Mine. Water management structures (surface ponds, water retention dikes/berms, water diversion channels and culverts) are in place and will be constructed as needed to contain and manage the contact water from the areas affected by the Mine or mining activities. The major water management infrastructure includes water collection ponds, water retention dikes, berms, channels, a potable Water Treatment Plant (WTP), a Sewage Treatment Plant (STP), a Reverse Osmosis (RO) Plant, an Effluent Water Treatment Plant (EWTP), and a Saline Effluent Treatment Plant (SETP).

During mine Construction and Operations, contact water originating from affected areas on surface will be intercepted, diverted and collected within the various collection ponds. The collected water at the Mine will be eventually pumped and stored in Collection Pond 1 (CP1), where the contact water will be treated by the EWTP for removal of Total Suspended Solids (TSS) prior to discharge to the receiving environment. Contact water from the Underground Mine will be collected in underground storage stopes and sumps. Some water from Underground will be reused for underground operations. Excess saline contact water will be pumped to and stored in surface saline ponds, and subsequently treated at the SETP for discharge to the sea.

The long-term, post-closure water quality in the collection ponds and in the flooded open pit lakes will meet Metal and Diamond Mining Effluent Regulations (MDMER), Canadian Council of Ministers of the Environment Water Quality Guidelines (CCME-WQG) for the protection of aquatic life and/or the Site-Specific Water Quality Objectives (SSWQOs) developed for the Mine.

During mine closure, the water management infrastructure on site will remain in place until mine closure activities are completed and monitoring demonstrates that the water quality is acceptable for environmental discharge without treatment.

ᐊᐅᓚᑦᑎᔾᓂᖅᑳᕐᑐᑦ ᓇᐃᓈᖅᓯᔪᑦ

ᐊᒡᓃᑯ ᐋᒍ ᐅᔭᕋᒃᑕᓇᐊᓕᓇᔫᒃᑯᑦ (ᐊᒡᓃᑯᒃᑯᑦ) ᐊᐅᓛᖅᑎᑦᑎᔪᖅ ᑕᓯᕐᔪᐊᕐᒥᑦ ᒎᓗᒧᑦ ᐅᔭᕋᒃᑕᓇᐊᕐᒥᑦ (ᐅᔭᕋᒃᑕᓇᐊᖅ), 25 ᑭᓛᒥᑕᓪᓗᐊᓂᒃ ᐅᖓᓯᒃᑎᓯᔪᖅ ᐅᐊᖕᓇᖓᓂᑦ ᑲᖏᖅᓱᓂᐅᑉ, ᐊᒻᒪᓗ 80 ᑭᓛᒥᑕᓪᓗᐊᓂᒃ ᐅᖓᓯᒃᑎᓯᔪᖅ ᓂᒋᖅᐸᓯᐊᓂᑦ/ᐱᖓᖕᓇᖅᐸᓯᐊᓂᑦ ᐃᒡᓗᓕᒫᕐᔪᖕᒥᑦ ᑭᕙᓪᓕᕐᒥᑦ ᓄᓇᕗᒻᒥᑦ. ᐅᔭᕋᒃᑕᓇᐊᕐᒧᑦ ᐸᕐᓇᐅᑎ ᐅᔭᕋᒃᑕᕐᓂᕐᒧᑦ ᐱᓕᓇᐊᖃᕈᒪᔪᑦ ᓄᓇᒥᑦ ᐅᒃᑯᐃᖓᔪᒥᑦ ᐊᒻᒪᓗ ᐊᑐᖅᑕᐅᓂᐊᖅᑐᓂᒃ ᐱᕙᓪᓕᐊᓗᒍ ᑎᓇᓂᐊᖅ ᒎᓗᑕᓕᒃ, ᒪᕐᕉᖕᓂᒃ ᓄᓇᒥᑦ ᐅᒃᑯᐃᖓᔪᓂᑦ (ᑎᓇᓂᐊᖅ 1 ᐊᒻᒪᓗ ᑎᓇᓂᐊᖅ 2) ᐊᒻᒪᓗ ᐊᑕᐅᓯᖅ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐅᔭᕋᒃᑕᕐᓂᖅ.

ᐃᒪᕐᒥᒃ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐱᓕᓇᐊᖑᔪᒪᔪᑦ ᒥᑭᓛᒃᑰᖅᑎᓪᓗᒋᑦ ᐊᒃᑐᖅᓯᓂᐅᔪᖕᓇᖅᑐᑦ ᐃᒪᖃᖅᑎᒋᓂᖓ ᐊᒻᒪᓗ ᖃᓄᐃᓐᓂᖓᑕ ᖄᖓᓃᑦᑐᑦ ᐃᒪᐃᑦ ᐅᔭᕋᒃᑕᓇᐊᕐᒥᑦ. ᐃᒪᕐᒥᒃ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐋᖅᑭᐅᒪᔪᑦ (ᓄᓇᐅᑉ ᖄᖓᓂᑦ ᐃᒪᖅᓱᐃᑦ, ᐃᒪᕐᒥᒃ ᐸᐸᑦᑎᓂᕐᒧᑦ ᐊᕙᓗᐃᑦ, ᐃᒪᕐᒥᒃ ᓴᖑᑎᑦᑎᓂᕐᒧᑦ ᓱᑉᓗᐃᑦ ᐊᒻᒪᓗ ᓱᑉᓗᓖᑦ) ᑕᐃᒪᐅᔪᑦ ᐊᒻᒪᓗ ᓴᓇᔭᐅᓂᐊᖅᑐᑦ ᐱᔭᕆᐊᖃᕐᒪᑕ ᓄᖅᑲᖓᑎᓪᓗᒍ ᐊᒻᒪᓗ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐊᒃᑐᖅᑕᐅᔪᑦ ᐃᒪᐃᑦ ᐃᓂᐅᔪᓂᑦ ᐊᒃᑐᖅᑕᐅᓯᒪᔪᓂᑦ ᐅᔭᕋᒃᑕᓇᐊᕐᒥᑦ ᐅᕝᕙᓘᓐᓃᑦ ᐅᔭᕋᒃᑕᖅᑎᓪᓗᒋᑦ. ᐊᖏᔪᖅ ᐃᒪᓕᓇᕝᕕᖕᒥᑦ ᐃᓚᐅᔪᑦ ᐃᒪᕐᒥᒃ ᑲᑎᑦᑎᕝᕕᐅᔪᑦ ᑕᓯᕋᔭᐃᑦ, ᐃᒪᕐᒥᑦ ᐱᓯᒪᓂᕐᒧᑦ ᐊᕙᓗᐃᑦ, ᓱᑉᓗᐃᑦ, ᐃᒥᖅᑕᐅᓂᐊᖅᑐᒥᒃ ᐃᒪᓕᓇᕝᕕᒃ (WTP), ᖁᕝᕙᖕᒥᕐᒫᖅᑐᓕᓇᕝᕕᒃ (STP), ᐃᒪᑦᑎᐊᕙᓕᐅᕝᕕᒃ (RO), ᑯᕕᔪᓂᒃ ᐃᒪᓕᓇᕝᕕᒃ (EWTP), ᐊᒻᒪᓗ ᑕᓇᐅᓕᖕᒥᑦ ᐃᒪᕐᒥᑦ ᑯᕕᔪᓕᓇᕝᕕᒃ (SETP).

ᐅᔭᕋᒃᑕᓇᐊᖅ ᓴᓇᔭᐅᑎᓪᓗᒍ ᐊᒻᒪᓗ ᐊᐅᓛᖅᑎᑕᐅᑎᓪᓗᒍ, ᐊᒃᑐᖅᑕᐅᓯᒪᔪᖅ ᐃᒪᖅ ᐱᔭᐅᔪᖅ ᐊᒃᑐᖅᑕᐅᓯᒪᔪᓂᑦ ᐃᓂᐅᔪᓂᑦ ᓄᓇᐅᑉ ᖄᖓᓂᑦ ᐱᔭᐅᓂᐊᖅᑐᑦ, ᓴᖑᑎᑕᐅᓗᑎᒃ ᐊᒻᒪᓗ ᑲᑎᑕᐅᓗᑎᒃ ᐊᔾᔨᕆᙱᑦᑐᓐᑦ ᑲᑎᑦᑎᕝᕕᐅᔪᑦ ᑕᓯᕋᔭᖕᓄᑦ. ᑲᑎᑕᐅᓯᒪᔪᖅ ᐃᒪᖅ ᐅᔭᕋᒃᑕᓇᐊᕐᒥᑦ ᑯᕕᑎᑕᐅᓕᕋᑦᑕᕐᓂᐊᕐᓗᓂ ᐊᒻᒪᓗ ᑲᑎᑦᑎᕝᕕᐅᔪᖅ ᑕᓯᕋᔭᒃ 1-ᒧᐊᖅᑕᐅᓗᓂ (CP1), ᐊᒃᑐᖅᑕᐅᓯᒪᔪᖅ ᐃᒪᖅ ᐱᓕᓇᐊᖑᖃᑦᑕᖅᐳᓂ EWTP-ᒥᑦ ᐲᕐᓂᐊᕐᓗᒋᑦ ᑲᑎᓯᒪᔪᑦ ᑖᓂᖅᓱᖅᑐᑦ ᓯᑎᔪᐃᑦ (TSS) ᑯᕕᑎᑕᐅᓂᐊᕌᖅᑎᓪᓗᒍ ᓯᓚᒧᑦ. ᐊᒃᑐᖅᑕᐅᓯᒪᔪᖅ ᐃᒪᖅ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐅᔭᕋᒃᑕᓇᐊᕐᒥᑦ ᐱᔪᖅ ᑲᑎᑕᐅᓂᐊᖅᑐᖅ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᑐᖅᑯᖅᓯᓯᒪᕝᕕᖓᒧᑦ ᑯᕕᑎᑎᑦᔪᑎᓄᓪᓗ. ᐃᓚᖓ ᐃᒪᖅ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐱᔪᖅ ᐊᑐᖅᑕᐅᒃᑲᓂᕐᓂᐊᖅᑐᖅ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐊᐅᓛᖅᑎᑦᑎᓂᕐᓄᑦ. ᐊᒥᐊᒃᑰᔪᑦ ᑕᓇᐅᓕᒃ ᐊᒃᑐᖅᑕᐅᓯᒪᔪᖅ ᐃᒪᖅ ᑯᕕᑎᑕᐅᓂᐊᖅᑐᖅ ᐊᒻᒪᓗ ᑐᖅᕐᑯᖅᑕᐅᓗᓂ ᓄᓇᐅᑉ ᖄᖓᓂᑦ ᑕᓇᐅᓕᖓᓄᑦ ᑕᓯᕋᔭᖓᓄᑦ, ᐊᒻᒪᓗ ᐱᓕᓇᐊᖑᓕᕐᓗᓂ SETP-ᒥᑦ ᑯᕕᑎᑕᐅᓂᐊᕐᓗᓂ ᑕᓇᐅᕐᒧᑦ.

ᐊᑯᓂᐅᔪᒧᑦ, ᐅᒃᑯᐊᖅᓯᒪᓕᖅᑎᓪᓗᒍ ᐃᒪᐅᑉ ᖃᓄᐃᓐᓂᖓ ᑲᑎᑦᑎᕝᕕᐅᔪᑦ ᑕᓯᕋᔭᖕᓃᑦᑐᑦ ᐊᒻᒪᓗ ᐃᒻᒥᖅᑐᖅᑕᐅᓯᒪᔪᑦ ᓄᓇᒥᑦ ᐅᒃᑯᐃᖓᔪᑦ ᑕᔫᑦ ᑎᑭᐅᑎᓯᒪᓂᐊᖅᑐᑦ ᓴᕞᑦ ᐊᒻᒪᓗ ᓯᑎᔪᓂᑦ ᐅᔭᖅᖃᓂᒃ ᐅᔭᕋᒃᑕᓇᐊᕐᒥᑦ ᑯᕕᔪᓄᑦ ᒪᓕᒐᕋᓛᓂᑦ (MDMER), ᑲᓇᑕᒥᑦ ᒦᓂᔅᑕᐅᑏᑦ ᑲᑎᒪᔾᔪᑎᑦ ᐊᕙᑎᒥᑦ ᐃᒪᐅᑉ ᖃᓄᐃᓐᓂᖓᓄᑦ ᒪᓕᒃᑕᐅᔪᒃᓴᖏᓐᓂᑦ (CCME-WQG) ᒥᐊᓂᕆᓂᐊᕐᓗᒋᑦ ᐃᒪᕐᒥᐅᑕᐃᑦ ᐆᒪᔪᑦ ᐊᒻᒪᓗ/ᐅᕝᕙᓘᓐᓃᑦ ᐅᓂᐅᔪᒥᑦ ᐃᒪᐅᑉ ᖃᓄᐃᓐᓂᖓᓄᑦ ᐱᔭᒃᓴᐅᑎᐅᔪᑦ (SSWQOs) ᐋᖅᑭᒃᑕᐅᓯᒪᔪᑦ ᐅᔭᕋᒃᑕᓇᐊᕐᒧᑦ.

ᐅᔭᕋᒃᑕᓇᐊᖅ ᐅᒃᑯᐊᖅᐸᓪᓕᐊᑎᓪᓗᒍ, ᐃᒪᕐᒥᒃ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐱᕐᑰᑎᑦ ᐃᓂᐅᔮᓂᐊᖅᑐᑦ ᑭᓯᐊᓂ ᐅᔭᕋᒃᑕᓇᐊᖅ ᐅᒃᑯᐊᖅᑕᐅᕙᓪᓕᐊᓂᖓ ᐱᐊᓂᒃᐸᑕ ᐊᒻᒪᓗ ᖃᐅᔨᒋᐊᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓇᖅᓯᒃᐸᑦ ᐃᒪᐅᑉ ᖃᓄᐃᓐᓂᖓ ᓈᒻᒪᓕᕐᓂᖓᓄᑦ ᐊᕙᑎᒧᑦ ᑯᕕᑎᓐᓂᐊᕐᓗᒍ ᐱᓕᓇᐊᖑᕐᒥᓪᓗᓂ.

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LIST OF FIGURES

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DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
6	March 2019	All	All	Update is to fulfill annual review requirement (NWB)	Environment Department
		1	4	Update to Mine Development Plan information	
		3.1	8-12	Updated Version 6 changes	
		3.2	11-12	Updated existing water management control structures	
		3.3	12-14	Revised structure design semantics; corrections to culvert design; updated CP3, CP4 design parameters and naming convention; removed incorrect artifact pertaining to culvert 1 flow handling	
		3.6	15	Addition of SP3; updates to SP2 design	
		3.8, 3.9	17-21	Included as-built parameter values; updated berm and dike naming convention, thermistor information	
		3.11	21-22	Updated freshwater intake design information; updates to SWTP system; RO management; EWTP monitoring; removed incorrect information pertaining to Freshwater intake	
		4.1, 4.2	25-31	Updated management of saline discharge to sea; revised information proposed in initial design	
		4.6	35	Updated key management activities schedule to include discharge to sea; updated regarding underground inflow management; revised haul road management; revised wash bay management; updated process water quantities	
		6.3	37	Updated impacted waterbodies status	
		7	40	Revised semantics regarding flow paths	
				Included additional information regarding July 23rd exceedance	
		Figure 1.2		Updated Layout to most recent General Mine Site Plan	
		Figure 6.1, 6.2		Specified plan layouts are from feasibility level study	
		Figure 7.1a		Updated Layout with monitoring stations to most recent General Mine Site Plan	
7	August 2019	3.9.4	20	Updated EWTP trigger limit to account for variance introduced by TSS-turbidity correlation strength	
		4.1	26	Updated Key Activities (Table 10) to reflect changes to H19/H20 dewatering schedule	
		4.1.1	27-28	Revised H19/H20 dewatering plan with requirements for advancement in dewatering schedule; Updated dewatering schedule (Table 11)	

8	November 2019	3.5	15-16	Updated Saline Pond section to include current existence of SP2 and plans for construction of SP4.
		Figure 3.2	55	Figure changed from planned location of SP2 to planned location of SP4.
9	March 2020	All	All	Update is to fulfill annual review requirement (NWB)
		Exec. Summary		Updated to include SETP, excess saline contact water management
		3.1	9	Updated existing water management systems (saline ponds, SETP, discharge to sea)
		3.2		Updated Table 2 and Table 3
		3.3	12 13	Updated to include CP4 as existing structure and modified CP6 construction date
		3.4		Update to Section
		3.5	15	Updated to Section
		3.6	15	Updated Table 7
		3.9	16-17 19-21	Update to SWTP and EWTP systems, addition of SETP
		3.11	22	Updated management of saline water discharge to sea
		3.12		Update to Section
		4.1	23	Updated Table 10 and Section
		4.2	26-30	Updated process water management
		4.3	31 32-33	Updated Meliadine Lake diffuser effluent flow rates and EWTP sludge disposal options
		5		Update to Section
		7	33-34 40	Update to Section. Removed information already presented in annual report (i.e., MEL-14 and MEL-SR results).
		Figure 1.1		Updated Layout to most recent General Mine Site Location Plan
		Figure 1.2		Updated Layout to most recent General Mine Site Plan
10	July 2020 2021	All		Updated to support Water Licence Amendment
		3	All 11-22	Updated to include CP2, CP2-Berm, Channel 9 and 10, and decommissioning of SP2
		3.1		Updated Table 1 and section
		3.2	13	Updated Table 3 and section
		3.3	15	Updated Table 4 and section
		3.5	16	Removed SP2 and updated Table 6 and section
		3.6	18	Updated Table 7 and 8 and section
		3.9.4	18-20	Update to EWTP system
		4	25	Updated to add CP2 and update Table 9 and 10
		4.3	27-35	Update EWTP discharge rate and Table 13
		5	34-35 36-38	Water Balance update, moved section of Water Balance results and table into appendix C
		6		Water Quality update

		7	40-41	ICRP 2020 update and Table 16 to include CP2
		Figure 2	42	Updated layout to most recent General Mine Site
		Figure 4		Updated following decommissioning of SP2
		Figure 6		Updated to include CP2 monitoring
		Figure 8		Updated layout to most recent General Mine Site during closure
		Figure 9		Updated layout to most recent General Mine Site after closure
11	August 2021	All		Updated as per Part B, Item 13 of the Amended
			All	Water Licence
		2.2		Updated section to reflect current Mine Plan
		3	8-9	Added terminology and definitions for Plan clarity,
			10	removed Evaporators subsection
		3.1		Removed SWTP from water management systems,
			10	updated Table 1
		3.4		Updated section and Table 5 to reflect P-Area
			15-16	decommissioning
		3.5		Added section on Contaminated Snow Cell
		3.6	16	Updated section and Table 6 to include Tiriganiaq
			16-17	Pit 2 as saline water storage
		3.9.3		Updated section to reflect current SWTP status
		3.9.4	20-21	Section reorganized to include EWTP and SETP in
			21	Water Treatment Complex (WTC)
		3.9.4.3		Added section to discuss current and possible
			22	future sludge management options
		3.9.5		Updated to include second oil water separator at
			22	the maintenance shop wash bay
		4		Updated section and Table 9 to include Tiriganiaq
			26	Pits 1 and 2 in Water Management Strategy items
		4.1		Updated section and Table 10
		4.3	28-30	Updated section and Table 13
		5 & 6	35	Updated sections, removed WB and WQ results
			35,37	from document (these are/will be provided in Annual Reports)
12	April 2022	3.9.6	23	Added RO treatment section.
13	April 2023	2.1.5	8	Minor changes to the local hydrology section text
		3.1	10-12	Addition of channel 2 berm planned in Q2 2023
		3.2	14	Modification of as-built numbers
		3.4	15-16	Text update on section P-area containment ponds
		3.6	16-17	Addition of description on SP3 saline pond
		3.7	18	Update of as-built numbers for channels 9 and 10, addition of channel 2 berm
		4.1	30	Management activities accomplished in 2022 and planned for 2023
		4.1.2	32	Modification of predicted Groundwater inflows for version V14 of the Golder model
		4.3	38	Update of Effluent discharge numbers for 2022

14	March 2024	All	All	Improved grammar and general clarity.
		All	All	Added table and figure cross-reference links.
		2.1.5	9-10	Updated permafrost information from existing conditions report.
		3.6	18	Added statement regarding no water in saline ponds discharging to Meliadine Lake.
		3.9.4.1	22	Revised wording on EWTP flow rates and added current operating configuration.
		3.9.6	24-25	Updated RO permeate TDS average and added limit on permeate TDS.
		3.11	25-26	Removed statement on punctual saline water hauling operations.
		4.1	32	Updated major activities in Table 10 years 2023+.
		4.1.1	33	Added dewatering of lakes in 2022.
		4.1.2	34-35	Updated groundwater inflow predictions.
		4.1.4	35	Added landfill water management changes following Licence modification.
		4.3	37	Revised wording on EWTP flow rates and added current operating configuration.
		5.1	38-44	Inserted model WBWQM setup and methods from annual report. Results are now exclusive to annual report text.

ACRONYMS

Agnico Eagle	Agnico Eagle Mines Limited
AWAR	All Weather Access Road
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
CCME-WQG	Canadian Council of Ministers of the Environment Water Quality Guidelines
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
CP	Collection Pond
ECCC	Environment and Climate Change Canada
EQC	Effluent Quality Conditions
EWTP	Effluent Water Treatment Plant
FDP	Final Discharge Point
FEIS	Final Environmental Impact Statement
GTC	Ground Temperature Cable
GWMP	Groundwater Management Plan
ICRP	Interim Closure and Reclamation Plan
IDF	Inflow Design Flood
Licence	Type A Water Licence 2AM-MEL1631
MDMER	Metal and Diamond Mining Effluent Regulations
NIRB	Nunavut Impact Review Board
NWB	Nunavut Water Board
Mine	Meliadine Gold Mine
OP	Ore Pad
RO	Reverse Osmosis
SD	Support Document
SETP	Saline Effluent Treatment Plant
SP	Saline Pond
SSWQO	Site Specific Water Quality Objective
STP	Sewage Treatment Plant
SWTP	Saline Water Treatment Plant
TDS	Total Dissolved Solids
TSF	Tailings Storage Facility
TSS	Total Suspended Solids
WBWQM	Water Balance and Water Quality Model
WMP	Water Management Plan
WQ-MOP	Water Quality Management and Optimization Plan
WRSF	Waste Rock Storage Facility
WTC	Water Treatment Complex

WTP	Water Treatment plant

UNITS

%	percent
°C	degrees Celsius
°C/m	degrees Celsius per metre
mg/L	milligram per litre
km	kilometer(s)
km^2	kilo square meter(s)
m	metre
mm	millimetre
m^3	cubic metre(s)
m^3/day	cubic metre per day
m^3/s	cubic metre per second
m^3/hour	cubic metre per hour
m^3/year	cubic metre per year
Mm^3/year	million cubic metre (s) per year
Mm^3	million cubic metre(s)
masl	metres above sea level
Mt	million tonne(s)

SECTION 1 • INTRODUCTION

Agnico Eagle Mines Ltd. (Agnico Eagle) operates the Meliadine Gold Mine (the Mine) located approximately 25 kilometres (km) north of Rankin Inlet (Figure 1), Nunavut, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut. The Mine is subject to the terms and conditions of both the amended Project Certificate 006 issued by the Nunavut Impact Review Board (NIRB) in accordance with the Nunavut Land Claims Agreement Article 12.5.12 on March 2nd, 2022 (NIRB, 2022) and the Amended Water Licence No. 2AM-MEL1631 (the Licence), issued by the Nunavut Water Board (NWB) on May 13th, 2021 and approved by the Minister of Northern Affairs on June 23rd, 2021 (NWB, 2021).

This document presents an updated version of the Water Management Plan (WMP).

1.1. Water Management Objectives

The water management objectives are to minimize potential impacts to the quantity and quality of surface water at the Mine and surrounding waterbodies. The purpose of the WMP is to provide information to applicable mine departments (e.g., Environment, Engineering, Mine, Energy and Infrastructure, etc.) for sound water management practices, proposed and existing infrastructure, the water balance model, water quality predictions, and for the water quality monitoring plan for the Mine.

Water management structures (collection ponds, culverts, sumps, pipelines, water diversion channels and water retention dikes/berms) are utilized to contain and manage contact water from areas affected by mining activities. Measures have been implemented for the Mine Construction and Mine Operation phases.

1.2. Management and Execution of the Water Management Plan

Revisions of the WMP can be initiated by changes in the Mine Development Plan (Mine Plan), operational performance, personnel or organizational structure, regulatory or social considerations, and/or design philosophy. The WMP will be reviewed annually by Agnico Eagle and updated as necessary. When updates are made, the new version of the WMP will be submitted to the NWB for approval.

SECTION 2 • BACKGROUND

2.1. Site Conditions

The Mine is located in an area of poorly drained lowlands near the northwest coast of Hudson Bay. The dominant terrain in the area consists of glacial landforms such as drumlins (glacial till), eskers (gravel and sand), and many small lakes. The topography is gently rolling with a mean elevation of 65 metres above sea level (m asl) and a maximum relief of 20 meters.

The local overburden consists of a thin layer of topsoil overlying silty gravelly sandy glacial till. Cobbles and boulders are present throughout the region at various depths. Bedrock at the Mine site area consists of a stratigraphic sequence of clastic sediments, oxide iron formation, siltstones, graphitic argillite, and mafic volcanic flows (Snowden, 2008; Golder, 2009).

The climate is extreme in the area, with long cold winters and short cool summers, and mean air temperatures of 12°C in July and -31°C in January. The mean annual air temperature at the Mine site is approximately -10.4 °C (Golder, 2012a). Strong winds blow from the north and north-northwest direction more than 30 percent of the time.

The mean annual precipitation in the area is approximately 412 mm and is typically equally split between rainfall and snowfall.

2.1.1. Local Hydrology

The Mine is located within the Meliadine Lake watershed. Meliadine Lake has a water surface area of approximately 107 square kilometres (km^2), a maximum length of 31 km, features a highly convoluted shoreline of 465 km, and has over 200 islands. Unlike most lakes, it has two outflows that drain into Hudson Bay through two separate river systems. It has a drainage area of 560 km^2 upstream of its two outflows. Most drainage occurs via the Meliadine River, which originates at the southwest end of the lake. The Meliadine River flows for a total stream distance of 39 km. The Meliadine River flows through a series of waterbodies, until it reaches Little Meliadine Lake and then continues into Hudson Bay. A second, smaller outflow from the west basin of Meliadine Lake drains into Peter Lake, which discharges into Hudson Bay through the Diana River system (a stream distance of 70 km). At its mouth, the Diana River has a drainage area of 1,460 km^2.

Watersheds in the Mine area are comprised of an extensive network of waterbodies, and interconnecting streams. The hydrology of these watersheds is dominated by lake storage and evaporation.

2.1.2. Ice and Winter Flows

Late-winter ice thicknesses on freshwater lakes in the Mine area range between 1.0 to 2.3 m with an average thickness of 1.7 m. Ice covers usually appear by the end of October and are completely formed in early November. The spring ice melt (freshet) typically begins in mid-June and is complete by early July (Golder, 2012b).

2.1.3. Spring Melt (freshet) and Freeze-up Conditions

With the exception of the main outlet of Meliadine Lake, which has been observed to flow continuously throughout the year, outlets of waterbodies near the Mine typically start flowing late May or early June, followed by freshet flows in mid-to-late-June. Flows steadily decrease in July and low flows are ongoing from August to the end of October, prior to winter freeze.

2.1.4. Permafrost

The Mine is located in an area of continuous permafrost. The depth of permafrost is estimated to be in the order of 320 to 490 m (WSP, 2024). The depth of the active layer ranges from about 1 m in areas with shallow overburden, up to 3 m adjacent to the lakes. The typical permafrost ground temperatures at the depths of zero annual amplitude (typically at the depth of below 15 m) are in the range of -5.0 to -7.5 °C in the areas away from lakes and streams. The geothermal gradient ranges from 0.012 to 0.02 °C/m (Golder, 2012b).

2.1.5. Local Hydrogeology

Continuous permafrost areas, in dominant presence in the Mine area, are subject to the following groundwater flow regimes characteristics:

- A shallow flow regime located in an active layer (seasonally thawed) near the ground surface and above permafrost, also called suprapermafrost groundwater; and,
- A deep groundwater flow regime beneath the base of the permafrost, also called subpermafrost groundwater.

From late spring to early autumn, when temperatures are above 0 ˚C, the shallow active layer thaws. Within the active layer, the water table is projected to be a subdued replica of topography. Groundwater within the active layer flows to local depressions and ponds that drain to larger waterbodies. The talik, or unfrozen ground, beneath large waterbodies will be open. Open taliks define areas of connections between suprapermaforst groundwater and deep groundwater flow regime beneath the permafrost.

Analytical solutions were used by Golder (2012a) to evaluate the critical lake sizes to support open taliks. The analysis indicated that taliks extending through permafrost will exist beneath circular lakes with minimum radius of 290 to 330 m and beneath elongate lakes having a minimum half width of approximately 160 to 195 m. When terrace effects are included in the analysis, the critical radius for a circular lake increases to between approximately 305 to 485 m, and the critical half width for an elongate lake increase to between approximately 170 and 280 m. Meliadine Lake, Lake B7, Lake B8 and Lake D7 will have open taliks connected to the deep groundwater flow regime. Lake A8 and Lake B5 are considered possible (WSP, 2024).

2.2. Mine Development Plan

The Mine Plan and key mine development activities, including mine waste management are currently used concurrently with the WMP.

The Mine Plan includes one underground mine (Tiriganiaq Underground Mine) and two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) for the development of the Tiriganiaq gold deposit.

The Mine is expected to produce approximately 14.6 million tonnes (Mt) of ore, 35 Mt of waste rock, 8.8 Mt of overburden waste, and 14.6 Mt of tailings. The following phased approach is proposed for the development of the Tiriganiaq gold deposit;

- Phase 1: 3.5 years for Mine Construction (Q4 2015 to Q2 2019);
- Phase 2: 8.5 years for Mine Operations, beginning in 2019 (Q2 2019 to 2027);
- Phase 3: 3 years Mine Closure (2028 to 2030); and;
- Phase 4: Post-Closure (2030 forward).

Mining facilities on surface include a plant site and accommodation buildings, an ore stockpile, a tailings storage facility (TSF), two waste rock storage facilities (WRSFs), a water management system that includes collection ponds, water diversion channels, retention dikes/berms, and a series of water treatment plants. The general mine site layout plan is shown on Figure 2.

SECTION 3 • WATER MANAGEMENT CONTROLS AND STRUCTURES

There are three major sources of water at the Mine requiring management under the Mine water management system: freshwater pumped from Meliadine Lake, natural runoff from precipitation, and natural groundwater inflow to the Underground Mine. For the purpose of clarity and consistency, terminology and definitions are applied to these three main sources as follows below. These terms are applied throughout the remainder of the WMP.

- **Freshwater**: Water contained within natural water bodies (e.g., Meliadine Lake) which has not come into contact with the mine infrastructure.

- **Surface Contact Water**: Rain and snowmelt that has come into contact with the mine infrastructure and is collected within the collection ponds.

- **Saline Contact Water**: Saline groundwater which flows into the underground mine and comes into contact with the underground mine infrastructure.

A network of berms, dikes, collection ponds, channels, culverts and sumps are in place and maintained to facilitate water management. Design Reports and As-Built Reports have been submitted and approved for the water management structures discussed in this section, as applicable. This section is included to summarize design and as-built information.

3.1. Water Management Systems

The water management systems, as shown in Figure 2 and Figure 3, include the following components:

- Six water collection ponds (CP1, CP2, CP3, CP4, CP5, and CP6) and their associated dikes or thermal berms (D-CP1, Berm CP2, Berm CP3, Berm CP4, D-CP5, and Berm CP6)
- Two saline storage ponds (SP1 and Tiriganiaq Pit 2)
- The P-Area (Pond P3 and associated berm DP3 [Ponds P1 and P2 have been decommissioned])
- Three diversion berms (Berm 1, Berm 2, and Berm 3)
- Ten water diversion channels (Channel 1 to Channel 10)
- Sixteen water passage culverts to convey surface contact water (Culverts 1 to 8, 10, 11, 13, 14 to 16, 18, 19 and 20)
- A reverse osmosis treatment plant (RO)
- An effluent water treatment plant (EWTP)
- A saline effluent treatment plant (SETP)
- A water treatment complex (WTC) building – housing the EWTP and SETP
- A sewage treatment plant (STP)
- A potable water treatment plant (WTP)

- A network of surface pumps and pipelines
- A freshwater intake
- Two jetties and pumping infrastructure (CP1 and CP5)
- An effluent diffuser located in Meliadine Lake
- An effluent diffuser located in Melvin Bay

The status of construction and planned construction dates of the above are listed in Table 1.

Surface contact water is intercepted, diverted and collected within various collection ponds prior to passive evaporation, treatment and/or discharge. Surface contact water collected in CP3 and CP4 is discharged into Culvert 2 where it flows to CP1. Surface contact water collected in CP5 is discharged into CP1. Surface contact water from the WRSF3 will be collected in CP2 and CP6 ponds and then pumped into CP1. Surface contact water collected in CP1 is treated for total suspended solids (TSS) at the EWTP (housed within the WTC) and discharged through the diffuser located in Meliadine Lake (Section 3.10).

Saline contact water from the Underground Mine is collected in underground sumps, transported to a clarification system, and subsequently recirculated for use in various underground operations. Excess saline contact water is pumped to surface where it is stored in Tiriganiaq Pit 2. Saline contact water that is not used for operations is treated at the Saline Effluent Treatment Plant (SETP). The treated water is then trucked to Itivia, as needed, and discharged through a diffuser in Melvin Bay (Section 3.11). Further details are found in Appendix A.

During the mine closure, the water management infrastructure will remain in place until closure activities are completed and monitoring demonstrates that water quality is acceptable for discharge to the environment without treatment.

A list of the water management control structures is presented in Table 1 with each respective construction status. Figure 2 shows the location of the respective structures over the development stages (Year – 5 to Year 8) of the mine life. Final design details of these structures will be provided to the Regulators for approval at least 60 days prior to construction, as per the Licence.

Table 1: Water Management Control Structures

Mine Phase	Infrastructure Name	Construction Status
Pre-Production Construction (Y-5 to Y 1)	Channel 1	Constructed
	Channel 2	Constructed
	Channel 3	Constructed
	Channel 4	Constructed
	Channel 5	Constructed

	Channel 6	TBD*
	Channel 7	Constructed
	Channel 8	Constructed
	Culvert 1	Constructed
	Culvert 2	Constructed
	Culvert 3	Constructed
	Culvert 4	Constructed
	Culvert 5	TBD*
	Culvert 6	TBD
	Culvert 7	Constructed
	Culvert 8	Constructed
	Culvert 10	Constructed
	Culvert 11	Constructed
	Culvert 13	Constructed
	Culvert 14	TBD
	Culvert 15	Constructed
	Culvert 16	Constructed
	Culvert 18	Constructed
	Culvert 19	TBD
	Culvert 20	Constructed
	CP1	Constructed
	CP3	Constructed
	CP4	Constructed
	CP5	Constructed
	D-CP1	Constructed
	Berm CP3	Constructed
	Berm CP4	Constructed
	D-CP5	Constructed
	CP1 Jetty	Constructed
	CP5 Jetty	Constructed

	Saline Pond (SP1)	Constructed
	Berm 1	Constructed
	Berm 2	Constructed
	Berm 3	Constructed
	Freshwater Intake Causeway & Pump Station	Constructed
	Submerged Diffuser	Constructed
	WTP Intake	Constructed
Sustaining Construction during Mine Operation (Y1 to Y 8)	CP6 and Berm CP6	Constructed
	Saline Pond 3 (SP3)	Constructed
	Saline Pond 4 (SP4)	Constructed
	CP2 and Berm CP2	Constructed
	Channel 9	Constructed
	Channel 10	Constructed
	Channel 2 Berm	Constructed

* Construction tentative based on future water management strategies

3.2. Water Management Structures Design Criteria

The water management systems meet the following criteria:

- Treated surface contact water quality will meet regulatory criteria of the Licence and MDMER (described in Appendix D).
- Treated saline water quality will meet MDMER criteria (described in Appendix D).
- Design capacity of the EWTP is sufficient to ensure that D-CP1 and CP1 is able to manage the surface contact water from the entire site for a 1:100 wet year spring freshet, or a 1:2 mean year spring freshet in combination with a 1:1000 return 24-hour extreme rainfall.
- D-CP5 and CP5 are able to manage the surface contact water from its catchment area for 3/7 of a 1:100 wet year spring freshet or a 1:1000 return 24-hour extreme rainfall. This design is based on an allowable 3-day delay in initiation of pumping during a 7-day, 1:100 year freshet. Design capacity of pumping from CP5 to CP1 is sufficient to ensure that remaining freshet inflows to CP5 are managed via pumping to CP1.

- Storage capacity of each of the other water management ponds (CP2, CP3, CP4, CP6) is able to manage the surface contact water from their respective catchment area for 3/7 of a 1:100 wet year spring freshet or a 1:1000 return 24-hour extreme rainfall.
- The daily pumping rate for each of the ponds (CP2, CP3, CP4, CP5, CP6) is designed to have sufficient pumping capacity to handle the runoff surface contact water, which would result from one day (24.4 mm) of a 1:100 return wet spring freshet plus a 1:2 return one-hour rainfall (9.8 mm).

Channel 2 to Channel 4 are in place to pass an extreme intensity flow under a 5-minute 1:100 return rainfall of 9.2 mm. Channels 9 and 10 were designed to pass an extreme intensity flow under a 5-minute 1:100 return rainfall of 5.0 mm. Channel 1 and Channel 5 to Channel 8 are designed as internal channels where any surface contact water overflowing the channels will remain within the catchment areas of various collection ponds. Hydraulic analyses indicated that very wide channels are required to pass an extreme intensity flow under a 5-minute 1:100 return rainfall of 9.2 mm. As a result, these channels were designed to have a reasonable bottom width to pass a flow with lesser intensity, but the surface contact water overflowing the channels can be safely managed by berms or temporarily stored in a lower basin nearby. For example, surface contact water overflowing Channel 5 can be contained by Berm 3. Water overflowing Channel 7 and Channel 8 can be stored in the lower basin in the drained Pond H13, and Berm 1 combined with a mass till backfill protects the Portal No.2 entrance from flooding. Furthermore, the MULTI-PLATE at Portal No. 2 is protected by compacted, engineered structural fill. Surface contact water overflowing Channel 1 will flow through the flat ground between the Stage 1 pad and Stage 2 pad of Ore Storage Pad 2 (OP2) into CP1. Table 2 presents the as-built parameters for CP1 and CP5.

Table 2: As-Built Parameters for CP1 and CP5

Pond	CP1	CP5
Pond Volume at Maximum Operating Elevation under Normal Operating Conditions and Mean Precipitation Years (m3)	742,075	46,674
Maximum Operating Water Elevation (m)	66.2	66.0
Maximum Water Elevation during IDF (m)	66.6	66.3
Estimated Pond Volume for Water Elevation at Maximum Operating Water Elevation during IDF (m^3)	855,245	70,000
Dike for Pond	D-CP1	D-CP5
As-Built Crest Elevation of Dike Collection Element (liner system) (m)	67.37	66.72

CP2, CP3, CP4 and CP6 are established through excavation of the original ground to increase water storage capacity and help ensure water levels do not reach the thermal protection berms. The as-built parameters for CP2, CP3, CP4 and CP6 are provided in Table 3 and are discussed in further detail within Tetra Tech (2022), Agnico Eagle (2019c), Agnico Eagle (2019d), and Tetra Tech (2020a).

Table 3: As-Built Parameters for CP2, CP3, CP4, and CP6

Pond	CP2	CP3	CP4	CP6
Elevated Pond Bottom Elevation (m)	41.4	53.3	51.0	51.1
Estimated Maximum Water Elevation during IDF (m)	52.0	63.0	63.0	62.0
Pond Volume at Estimated Maximum Water Elevation during IDF (m^3)	48,160	44,848	48,995	67,799
Thermal Berm for Pond	Berm-CP2	Berm-CP3	Berm-CP4	Berm-CP6

3.3. Water Collection ponds

Six water collection ponds (CP1, CP2, CP3, CP4, CP5, and CP6) have been constructed to date as part of the water management infrastructure. Table 4 presents the locations and the required operational period of the collection ponds. The locations of the six water collection ponds are shown in Figure 2.

Table 4: Location of Collection Pond and Required Operation Periods

Collection Pond	Relative Location	Required Operation Period
CP1	Pond H17 and H6	Year 2017 to Mine closure
CP3	North of Lake B7 and southwest of TSF	Year 2019 to Mine closure
CP4	Southeast of Lake B7 and south of WRSF1	Year 2019 to Mine closure
CP5	North of Tiriganiaq Pit 2	Year 2017 to Mine closure
CP6	Pond H19 and north of WRSF3	Year 2020 to Mine closure
CP2	East of WRSF3	Year 2022 to Mine closure

3.4. P-Area Ponds

The P-area formerly consisted of three storage ponds as part of the saline contact water management system from 2016 to 2018.

In 2019, inputs to the P-Area were limited in an effort to begin the decommissioning process of the containment structures. In 2020, no saline contact water inputs to the P-Area took place, with the only planned inputs resulting from precipitation runoff. Backfilling of the P-Area cells (P1 and P2) began in Q3 of 2020 and finished in Q3 of 2021 using waste rock obtained form the underground mine and open pits to promote permafrost aggradation. Backfilling of P3 is expected to take place in 2024, with a small portion of the cell being retained for the continued capture and management of water in this area.

Surface contact water captured by P3 is discharged to SP1 or CP5 based on TDS monitoring in P3, where marginally saline water (i.e. water suitable for treatment at the RO Plant [section 3.9.6]) is directed to SP1.

Table 5 presents the P3 capacity and maximum operating elevation. Figure 3 presents the layout of P3.

Table 5: As-Built Capacity for P-Area Ponds

Pond	P3
As-built Capacity (m^3)	2,912*
Maximum Design Water Elevation (m)	66.22*

*Former total as-built volume of P3 was 18,432 m^3, due to construction of SP3 and some filling within the P3 footprint, the volume corresponding to the maximum design water elevation is now reduced to 2,912 m^3.

Water monitoring protocols for P3 have been implemented to include water quality and transfer data, such as locations and flow volumes for water pumped to and from the collection ponds. This is discussed further in Appendix D.

3.5. Contaminated Snow Cell

A contaminated snow cell is used to store snow containing hydrocarbons (i.e., snow on which spills occur). The contaminated snow cell was constructed in 2017 (Agnico Eagle, 2017a) and is currently in place as a contingency measure for contaminated snow storage over the winter (Freshet Management Plan in Appendix B). Upon snowmelt, water within the contaminated snow cell is transferred to the Landfarm for treatment at the oil-water separator (Section 3.9.6).

The snow cell is lined with a polyethylene liner to avoid seepage of melting snow into the surrounding environment. The cell is designed to contain a volume of 1500 m^3 of snow and to contain 930 m^3 of water at a water surface elevation of 69.5 m.

3.6. Saline Ponds

Saline Pond 1 (SP1) was constructed in Q3 2016 to accommodate excess saline contact water from the Underground Mine. SP1 is located north of CP5 (Figure 2). Table 6 summarizes the Saline Pond capacity for storage and maximum designed operating water levels.

Saline Pond 2 (SP2) was constructed within the footprint of Tiriganiaq Pit 2 in Q2 2019 as a temporary saline contact water storage pond on site, accommodating excess saline contact water from the Underground Mine. In Q2 2020 SP2 was decommissioned to allow mining of Tiriganiaq Pit 2. Saline contact water stored in SP2 was emptied into Saline Pond 4 (SP4) which was commissioned in March of 2020.

Saline Pond 3 (SP3) was constructed within the footprint of P-Area Pond 3 (P3). Construction of SP3 was completed in Q2 2019. SP3 is part of the medium-term groundwater management strategy, that consists of treating groundwater from the Meliadine Underground with respect to quality standards and discharge the treated water effluent into Melvin Bay. SP3 was used to store the treated water exiting the former Saline Effluent Treatment Plant (SETP) (i.e., the SETP not within the WTC) before being discharged to sea.

Saline Pond 4 (SP4) was temporary in nature and allowed for the dewatering of SP2 to facilitate construction of Tiriganiaq Pit 2 while providing additional storage for saline contact water from the underground mine. SP4 was constructed in bedrock within the footprint of Tiriganiaq Pit 1 (Figure 4). SP4 was dewatered to Tiriganiaq Pit 2 in 2021 to facilitate mining beneath the facility and allow for mining to continue in Tiriganiaq Pit 1 in this area.

In Q3 2021, mining in Tiriganiaq Pit 2 was stopped and the pit was subsequently converted to a saline water storage facility. Tiriganiaq Pit 2 has a total saline water capacity of 1,616,554 m^3 and will be used to store the saline contact water pumped out of the underground mine. Further information on the saline contact water storage strategy is provided in Appendix A.

Groundwater from the underground mine is pumped to Tiriganiaq Pit 2 where it will remain in storage until it is treated at the SETP for discharge to sea (see Section 3.11 or Appendix A). In addition to storing saline groundwater, water held in the saline ponds also includes surface contact runoff (rain and snowmelt) that falls within the saline pond catchments. Water stored in the saline ponds is isolated from the surface runoff collection system (i.e., CP1 to CP6) and will thus not be discharged to Meliadine Lake. However, permeate water produced by the treatment of marginally saline water at the RO Plant is discharged to CP1 (section 3.9.6).

Table 6: Storage Capacities for Saline Pond 1 and Tiriganiaq Pit 2

Item	Saline Pond 1	Tiriganiaq Pit 2
Maximum Operational Water Elevation (m)	62.9	62.0
Maximum Water Capacity (m^3)	32,686*	1,616,554

* Tetra Tech (2017) maximum operating capacity, not including IDF storage

Saline pond water capacity in relation to stored volumes can be found in Table 2 of the Groundwater Management Plan (Appendix A).

3.7. Water Diversion Channels, Dikes and Berms

3.7.1. Water Diversion Channels

Nine water diversion channels (Channels 1 to 5, and 7 to 10) have been constructed and form part of the surface contact water management infrastructure. Construction of Channel 6 is tentative based on future water management strategies downstream of the P-area. Construction of Channels 9 and 10 was completed in Q2 2022. The as-built and design parameters for the water diversion channels are presented in Table 7.

Table 7: As-Built and Design Parameters for Channels

<table>
<tr><th>Channel</th><th>Approximate Total Length (m)</th><th>Bottom Width (m)</th><th>Side Slopes</th><th>Rip-rap Thickness (m)</th><th colspan="2">Minimum Bottom Slope Gradient (%)</th></tr>
<tr><td>1(As-built)</td><td>528</td><td>3</td><td>3(H):1(V)**</td><td>0.3 to 0.5</td><td colspan="2">0.2</td></tr>
<tr><td>2(As-built)</td><td>269.5</td><td>1.257</td><td>1.82(H):1(V)</td><td>0.277</td><td colspan="2">0.30†</td></tr>
<tr><td>3(As-built)</td><td>656</td><td>1.2 to 2.4 or 0.8 to 3.3*</td><td>1.8(H):1.0(V) to 3.5(H):1.0(V)</td><td>0.3†</td><td>5.3 (upper)</td><td>0.4 (lower)</td></tr>
<tr><td>4(As-built)</td><td>930</td><td>1.0 to 1.7 or 0.8 to 4.5*</td><td>1.8(H):1.0(V) to 5.0(H):1.0(V)</td><td>0.37</td><td>2.1 to 5.3 (upper)</td><td>0.1 to 4.2 (lower)</td></tr>
<tr><td>5(As-built)</td><td>429†</td><td>2.3 to 2.9</td><td>1.9(H):1(V)</td><td>0.2</td><td colspan="2">0.17†</td></tr>
<tr><td>6</td><td>69</td><td>1</td><td>3(H):1(V)</td><td>0.3</td><td colspan="2">0.44</td></tr>
<tr><td>7(As-built)</td><td>240</td><td>2</td><td>3(H):1(V)</td><td>0.59</td><td colspan="2">0.8 (Avg.)</td></tr>
<tr><td>8(As-built)</td><td>114</td><td>2.4</td><td>3(H):1(V)</td><td>0.3</td><td colspan="2">1.4 (Avg.)</td></tr>
<tr><td>9(As-built)</td><td>713</td><td>1.55 to 3.13 (avg 2.41)</td><td>1.6(H) to 2.5(H):1(V)</td><td>0.48</td><td colspan="2">0.7</td></tr>
<tr><td>10(As-built)</td><td>200</td><td>2.03 to 3.27 (Avg 2.64)</td><td>1.7(H) to 2.7H:1(V)</td><td>0.34</td><td colspan="2">1.5</td></tr>
</table>

* 1 m bottom width for first 100 m upstream section, and 2 m bottom wide for the remaining channel section

** Except from Sta. 0+050 to 0+130: 2(H):1(V)

† As-built parameter values not available; value displayed is from design

3.7.2. Water Retention Dikes and Berms

In general terms, “dikes” were constructed with impervious liner systems and “berms” are constructed with entirely till cores. At the end of Mine closure, when the water quality in the corresponding pond meets direct discharge criteria, each of the dikes and berms on site (except for Berm 2) will be breached to restore the original natural drainage paths. Berm 2 will remain in place to prevent non-contact water from off site from flowing into the TSF.

Water retention dikes D-CP1 and D-CP5 have been designed as a zoned earth fill dams with a geomembrane liner keyed into the permafrost foundation to limit the seepage through the dike and its foundation. The characteristics of the dikes and berms required for the WMP are summarized in Table 8.

Table 8: As-Built and Design Parameters for Water Retention Dike/Berm

Dike/Berm	Approximate Maximum Height (m)	Maximum Elevation (m)	Maximum Head of Water Retained (m)
D-CP1	6.6	68.5	3.6
Berm-CP2	5.07	58.6	0
Berm-CP3	4.9	69.9	0
Berm-CP4	5.0	69.1	0
D-CP5	3.3	67.3	1.4
Berm-CP6	6.0	68.0	0
DP1-A	3.7	70.5	68.5
DP1-B	3.4	70.7	68.7
DP2-A	4.0	69.5	67.5
DP3-A	3.4	69.0	67
Berm1	2.6	69.0	0
Berm2	1.5	varies	0
Berm3	2.76	67.37	0
Channel 2 Berm	1.7	-	-

3.7.2.1. Thermal Monitoring

Horizontal Ground Temperature Cables (GTCs) are installed along the key trenches of D-CP1 and D-CP5 at a depth of approximately 3 m below the original ground level. These installations are in place to verify that the foundations remain frozen and dike integrity is not compromised. D-CP1 and D-CP5 also contain vertical GTCs installed to an approximate depth of 15 m below the crest of each dike. Thermal berms of CP2, CP3, CP4 and CP6 contain vertical GTCs installed to approximately 8 m below original ground elevation to monitor the thermal performance of the foundation materials. Thermal records collected from these sensors provide temporal analysis of vertical temperature profiles to assess whether the structures are performing as designed.

D-CP1 and D-CP5 readings are obtained, recorded, and assessed weekly during open water season and monthly after freeze-up. Data loggers are set to record temperatures in the dikes every 12-hours. Reading frequency at the thermal berms is generally monthly during the first year following construction and quarterly thereafter. The measured readings are analyzed by an Agnico Eagle geotechnical engineer and are reported in the annual geotechnical inspection report.

In addition to thermal monitoring, visual geotechnical inspections of water management structures are performed, as described in Section 3.12 below.

3.8. Freshwater Intake

Freshwater usage at the Mine includes potable uses, fire suppression, make-up water for the mill, and other operational requirements, such as drilling water, dust suppression, paste backfill production, and use at the washbay. The main freshwater intake is located northeast of the industrial pad in Meliadine Lake, as shown on Figure 2. The intakes consist of vertical filtration wells fitted with vertical turbine pumps that supply water on demand. Both intake pipes are fitted with a screen of an appropriate mesh size to ensure that fish will not be entrained and shall withdraw water at a rate such that fish do not become impinged on the screen (NWB, 2021).

3.9. Water Treatment

Contact water will be treated (if necessary) to meet Licence requirements prior to being discharged to the environment. TSS mitigation techniques (i.e., attenuation ponds, silt screens, etc.), oil separation treatment, the STP, the SETP, the RO Plant, and the EWTP are used accordingly at various locations at the Mine prior to water being transferred to collection ponds and/or prior to effluent discharge to Meliadine Lake or Melvin Bay. Water quality criteria are discussed in Section 7 and Appendix D.

3.9.1. Freshwater Treatment Plant (WTP)

Freshwater from Meliadine Lake is treated in the WTP before being directed to the camp areas for potable (domestic) water uses. The design flow rate for freshwater for the main camp and accommodations is 216 m^3/day. In the WTP, freshwater is pumped through cartridge filters, then pumped through ultraviolet units, and finally treated with sodium hypochlorite (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. Operation and maintenance details for the WTP can be reviewed in the Operational & Maintenance Manual – Water Treatment Plant (Agnico Eagle, 2020a).

3.9.2. Sewage Treatment Plant (STP)

Wastewater from the accommodation complex and from satellite sewage tanks will be treated in the STP using a membrane bioreactor process before being directed to CP1. Operation and maintenance details for the STP can be reviewed in the Operational & Maintenance Manual – Sewage Treatment Plant (Agnico Eagle, 2021a). Sludge is pressed using a volute dewatering unit and stored in the active deposition zone WRSF1 or WRSF3 to ensure coverage with waste rock.

3.9.3. Saline Water Treatment Plant (SWTP)

In 2018, Agnico Eagle constructed and commissioned a Saline Water Treatment Plant (SWTP) consisting of two evaporator-crystallizers (SaltMakers) to treat saline contact water. The SWTP removes total suspended solids (TSS), calcium chloride ($CaCl_2$), sodium chloride (NaCl), metals, phosphorous (P), and nitrogen compounds from the influent saline contact water. Further specifications of the SWTP can be found within the SWTP Design Report (Agnico Eagle 2018) and the SWTP As-Built Report (Agnico Eagle 2019a).

In March 2020, operation of the plant was suspended due to poor performance coupled with high energy consumption and plant safety concerns. The SWTP is not currently a component of the groundwater management strategy. More information regarding the groundwater management strategy can be found in the Groundwater Management Plan (Appendix A).

3.9.4. Water Treatment Complex (WTC)

The WTC is a building designed to house both the EWTP and SETP. The design rationale for the WTC is to address concerns with the stability of the concrete slab at the previous EWTP building location. Additionally, the WTC provides a centralized building for contact water treatment, allowing for improved operational synergy.

Construction of the WTC commenced in Q3 2020. Further information regarding the WTC can be found the As-Built Report (Agnico Eagle 2021b).

3.9.4.1. Effluent Water Treatment Plant (EWTP)

The installation of the EWTP within the WTC (EWTP-WTC) was completed in Q2 2021 to allow for discharge to Meliadine Lake during the open water season.

The purpose of the EWTP-WTC (Actiflo® model ACP-700R) is to reduce Total Suspended Solids (TSS) to a target maximum concentration of 15 mg/L from the influent surface contact water pumped from CP1 prior to its discharge through the diffuser into Meliadine Lake.

The EWTP is designed to meet the minimum required rate of 12,000 m^3/d per the design requirements of dike D-CP1 (Tetra Tech, 2016b). While EWTP equipment has an operational range up to 28,000 m^3/d, the current system is configured to operate a maximum discharge rate of 18,000 m^3/d to prevent over-pressuring in the HDPE line that conveys water from the EWTP to the diffuser. Further information regarding EWTP-WTC operation can be found in the EWTP-WTC Operation and Maintenance Manual (Agnico Eagle 2021c).

Trigger limits for stopping discharge are in place at the EWTP-WTC as a component of TSS and TDS exceedance mitigation during periods of discharge. These trigger limits are derived from a regression analysis of TSS concentration as a function of turbidity, and TDS as a function of specific conductivity. The regressions are developed using MEL-14 grab sample laboratory measured specific conductivity and turbidity readings paired with corresponding TDS and TSS results. Rating curves are then applied to continuous *in situ* specific conductivity and turbidity readings taken from internal probes within the EWTP-WTC prior to discharge to approximate TDS and TSS, respectively. When a trigger limit is reached, the EWTP-WTC stops discharge immediately and begins recirculating treated water to CP1.

Agnico Eagle will continue to gather calibration/confirmatory paired samples in the future to actively increase the number of data points and strengthen the turbidity-TSS and conductivity-TDS correlations.

3.9.4.2. Saline Effluent Treatment Plant (SETP)

Prior to discharge of saline effluent to sea at Melvin Bay (see Section 3.11 and Appendix A), saline contact water on site is stored in saline ponds (Section 3.6). Saline contact water as well as other contact water is pumped to the SETP for ammonia and total suspended solids treatment. Treated saline contact water will meet MDMER end-of-pipe discharge criteria. Initial treatment includes a clarification unit for TSS removal. Next, break-point chlorination treatment is applied as necessary to remove elevated ammonia levels, which are inferred to be the result of the use of explosives and washing of development faces/muck underground. Excess chlorine is removed with activated carbon filters. The SETP was designed to treat 1,600 m^3/day of saline water for TSS and ammonia. Further information on the SETP design can be found in Agnico Eagle (2020b).

Commissioning of the new SETP within the WTC (SETP-WTC) is expected to take place in 2025. Operation of the SETP-WTC and subsequent discharge will occur following construction and commissioning of the waterline (more information can be found in Appendix A). Further information on the SETP-WTC design can be found in Agnico Eagle (2021d).

Prior to movement of saline water from the Meliadine Site to Itivia for discharge to sea over the open water season, Agnico Eagle will measure pH, chlorine, ammonia, turbidity, specific conductivity, and temperature of the effluent as a means to continually advise discharge operations and help ensure discharge parameters are met. Final discharge point (FDP) samples will be analyzed at an accredited laboratory as per MDMER requirements, as discussed within the Water Quality and Flow Monitoring Management Plan (Appendix D).

3.9.4.3. Sludge management

Sludge produced as part of the TSS removal processes at the EWTP-WTC is currently discharged into saline water storage. The sludge is sampled monthly to determine potential impact on the receiving saline ponds.

Prior to discharge, water from Tiri 02 will be treated to meet MDMER requirements. This treatment process will include the removal of suspended solids introduced through sludge deposition.

3.9.5. Oil Separators

An oil-water separator is installed at the Landfarm. The oil-water separator located at the Landfarm is used to treat both direct precipitation to the landfarm footprint and melt from snow containing hydrocarbons (i.e., snow on which spills occur) that is stored either in the landfarm or the contaminated snow cell over winter (Section 3.4). Treated water is analyzed for benzene, toluene, ethylbenzene and xylene (BTEX), lead, and oil and grease prior to discharge to CP1 or used on the windrows to increase moisture content, as required. Hydrocarbons removed from water are stored and managed as hazmat.

A second oil water separator is applied to treat water from the maintenance shop wash bay, in which mining equipment from both surface and underground operations undergo cleaning (Section 4.1.6). Treated water is analyzed for BTEX, lead, and oil and grease prior to discharge to CP1 or saline ponds depending on *in situ* specific conductivity applied to approximate TDS concentrations. Hydrocarbons removed from water are stored and managed as hazmat.

3.9.6. Reverse Osmosis Plant (RO)

A reverse osmosis (RO) treatment plant is used to treat marginally saline runoff water captured by site water management infrastructure that would otherwise be directed to saline water storage. The application of the RO through these means is intended to reduce storage requirements of saline water on site until the Waterline (see Appendix A) is operational (expected 2025). Permeate water produced by the RO – treated water of low salinity that passes through the semi-permeable membranes – is directed to CP1. Brine water – high salinity water rejected by the semi-permeable membranes – is directed to saline storage.

Efficacy of treatment is generally dependent on the quality and homogeneity of water being treated. As TDS of influent water increases, pressure against the semi-permeable membranes increases, resulting in a lower recovery of treated permeate and a greater volume of rejected brine. However, the treatment flow rate can be lowered to reduce pressure and improve permeate recovery in feed water with a high concentration of TDS. Other water quality constituents such as the concentrations of TSS, organic content, and certain minerals in the feed water may also negatively affect performance of the RO. As size exclusion is the mechanism driving treatment, the concentration of TDS in the permeate generally remains below 2300 mg/L (average for 2023 was 1230 mg/L) but can be influenced by feed water quality and treatment rates. However, permeate TDS will not exceed the Maximum Authorized Monthly Mean Concentration of 3500 mg/L for the Meliadine Lake FDP. Consequently, the TDS concentration in the brine by-product is primarily the difference in mass of feed water solutes and mass of permeate water solutes per unit of brine volume. Additionally, more stable quality conditions or homogeneity of the water source used to feed the RO allows a better adjustment of the treatment settings and thus an optimization of the recovery rate.

The treatment rate of the RO is primarily limited by the actual capacity and size of the plant, in addition to the influence of previously mentioned water quality factors. A rate of approximately 2000 m^3/day has been achieved with a recovery of 80% (i.e. 1600 m^3/d and 400 m^3/d of permeate and brine produced, respectively) where influent TDS was approximately 3500 mg/L. Depending on the objective of treatment (e.g. volume targets versus quality targets) a lower recovery rate may be used to ensure brine quality discharged to saline storage meets a desired TDS criteria, resulting in the allowance of feed water with much higher TDS while still treating water at an appreciable flow rate.

For example, feed water with a TDS concentration of approximately 12,000 mg/L has been treated at a rate of approximately 1500 m^3/d with a permeate recovery rate of 53%.

In addition to the treatment of marginally saline runoff, the plant may also be used to treat stratified layers of low salinity water in the saline ponds. The cause of low salinity water in the saline ponds is assumed to be driven by the downward exclusion of TDS during ice formation in addition to poorly mixed runoff inflows. This results in a relatively homogeneous stratified layer of water with a lower concentration of TDS overlaying more saline water in storage. Removing the marginally saline water from saline storage increases storage capacity for saline contact water from the underground mine.

3.10. Meliadine Lake Discharge Diffuser

The discharge diffuser is the final surface contact water effluent discharge location for the Mine. The overall purpose of the diffuser is to discharge water from CP1 (at sampling station MEL-14) to Meliadine Lake while providing minimal environmental impacts to the Lake. The effluent mixing will be dependent on ambient currents in Meliadine Lake, driven by wind during the open water period. The diffuser modelling was initially conducted by Golder Associates Ltd. (Golder, 2015) and updated design progress was reported by Tetra Tech EBA (Tetra Tech EBA, 2016). Further updates to the diffuser model were completed by Tetra Tech in support of the Water Licence Amendment (Tetra Tech, 2020).

3.11. Saline Water Discharge to Sea

Currently due to sufficient forecasted storage capacity until 2026, saline water on site is managed through storage and treatment of marginally saline water. The suspension of continuous hauling operation followed the approval of the waterline to discharge to sea (section 3.3.3) under the Amendment 002 of the NIRB Project Certificate No. 006 issued on March 2nd, 2022. The waterline is currently under construction and is expected to be commissioned in 2025. Once in operation, the waterline will be used in combination with the SETP-WTC to discharge treated saline water to Melvin Bay. Detailed information regarding treatment and discharge criteria are provided in the Groundwater Management Plan (Appendix A).

3.12. Water Management Structure Monitoring

Pursuant to Part E, Item 15 of the Licence, Agnico Eagle will carry out weekly inspections of all Water management structures during periods of flow and monthly thereafter. The records will be maintained for review upon request of an Inspector. More frequent inspections may be required at the request of an Inspector. Inspections will focus on structures and conditions detailed in Sections 3.12.1 to 3.12.5 to follow.

3.12.1. Culvert and Water Crossing Inspections

Culverts listed in Section 3.1, as well as culverts and water crossings along the All Weather Access Road (AWAR), Bypass Road, and at the Itivia site will be inspected for the following conditions. These inspections also satisfy the monitoring procedures outlined in the Sediment and Erosion Management Plan (Appendix C):

- Damage to the inlet or outlet of the culvert which may impede flow capacity;
- Bed erosion upstream and downstream of watercourse crossing structures;
- Scour under bridge abutments and abutment foundations;
- Erosion along cutslopes and fillslopes of embankments (rill and gully erosion);
- Blockages within the culvert including snow, ice, debris; and
- Snow cover or snow piles which would prevent routing of water towards the inlet of the culvert (only applicable prior to freshet).

In the case that any of the above conditions are observed, corrective actions will be taken to optimize culvert/water crossing function and integrity.

3.12.2. Collection Pond Inspections

Water collection ponds discussed in Section 3.3 and P3 pond discussed in Section 3.4 will be inspected for the following conditions:

- Laboratory water quality results as a trigger to implement mitigation actions;
- Unplanned inputs via surface runoff which are not part of the water management system; and
- Water level elevation above the operating manual maximum.

In the case that any of the above conditions are observed, corrective actions will be taken to prevent unaccounted for losses of available water capacity or potential compromise to dike integrity.

3.12.3. Dike and Thermal Berm Inspections

Dikes and thermal berms discussed in Section 3.6.2 are inspected to track natural (expected) movement of the structure. Pertaining to dikes, a "master" sketch of all the issues that were documented in the past is maintained as a means to spot any changes/new issues. Inspections focus on the upstream slope, the crest, the downstream slope, and downstream toe and observations include the following:

- New areas of movement/deterioration not previously documented;
- Changes to previously documented areas of movement/deterioration;
- Seepage through the downstream slope;
- Water presence in downstream channel/sump; and
- Areas of movement/deterioration of downstream channel/sump (where present).

Any issues or potential problems identified will be addressed accordingly by the Geotechnical Engineer in order to mitigate risks and maintain dike integrity.

3.12.4. Water Diversion Channel and Berm Inspections

In addition to the water management structures requiring inspections under the Water Licence, Agnico Eagle will carry out inspections of all channels on site listed within Section 3.6.1 and Table 1 for the following conditions:

- Obstructions to flow (ice, debris);
- Inflows not part of the water management system;
- Structural failure of channel banks;
- Seepage through water diversion berms resulting in water movement to areas not planned within the water management system; and
- Erosion of diversion berms (i.e., undercutting, slope failure).

In the case that any of the above conditions are observed, corrective actions as directed by the Geotechnical Engineer will be taken if there is potential for compromise effectiveness of the channel function or potential for unplanned impact to water quality or quantity in associated collection ponds.

SECTION 4 • WATER MANAGEMENT STRATEGY

A brief summary of the water management strategy for the Mine is presented as follows:

- Surface contact water from key mine infrastructure is diverted and/or collected in collection ponds (CP1, CP2, CP3, CP4, CP5, CP6, the Saline Ponds and P3).
- The collected surface contact water in CP2, CP3, CP4, CP5 and CP6 is pumped to CP1. Surface contact water collected in CP1 may be reused for operational purposes and/or treated by the EWTP prior to discharge via the diffuser into Meliadine Lake.
- Surface contact water in Tiriganiaq Pit 1 will be collected in a sump and, depending on salinity, pumped to a collection pond or to a saline pond.
- Saline contact water from the Underground Mine (i.e., saline groundwater) will be contained in underground sumps and the water storage stope and reused for mining operations. Excess saline contact water volumes will be stored in Tiriganiaq Pit 2 until it can be treated and discharged to Melvin Bay.
- Natural flooding of the open pits at end of mining will be supplemented by using freshwater from Meliadine Lake.
- Upon the completion of underground mining, the Underground Mine workings will be allowed to naturally flood by groundwater seepage.

Appendix B presents the Freshet Action Plan, which presents the freshet risk management and snow management practices for the Mine. Table 11 summarizes the overall contact water management plan for the key infrastructure and presents the initial water collection locations and final water destinations. The plans for water management at key areas are described in following sections.

Table 9: Overall Site Contact Water Management Plan

Contact Water Source	Initial Contact Water Collection Location	Final Contact Water Collection Location
Industrial Site Pad Area (camp/process plant area)	CP1	CP1
WRSF1 Area	CP1, CP4 and CP5	
WRSF3 Area	CP2 and CP6	
Dry Stack TSF Area	CP1 and CP3	
Ore Storage Pad 2 (OP2)	CP1	
Landfill	CP1	
Landfarm (biopile)	Sump within Landfarm	To CP1 after oil separation
Maintenance Wash Bay	Retention Tank	CP1 or surface saline storage (based on effluent salinity) after oil separation
Tiriganiaq Pit 1	Open pit sumps	Salinity based – CP4, CP5, SP1, or Tiriganiaq Pit 2.
Tiriganiaq underground	Sumps in underground mine	Sumps in underground mine, Tiriganiaq Pit 2, then discharged to sea

The following sections describe the strategy for water management at different areas for the Mine.

4.1. Key Water Management Activities

The activities required for the WMP are summarized in Table 10. Water management activities during closure are described in Section 6.

Table 10: Key Water Management Activities

Mine Year	Major Water Management Activities and Sequence
Q4 of Yr -5 (2015)	• Started to re-use saline contact water • Dewatered top 0.5 to 1.0 m of fresh water in Pond H17 • Constructed Channel 2
Yr -4 (2016)	• Dewatered H17 into Meliadine Lake • Started construction of D-CP1 to impound CP1 • Started construction of D-CP5 to impound CP5 • Dewatered Pond A54 in Q3 of Year -4 and pumped the water to CP1 • Constructed Saline Pond 1 (SP1) for additional saline contact water storage • Constructed and operated P-Area Containment Ponds • Started to store the excess saline contact water from the underground mine at surface

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Mine Year	Major Water Management Activities and Sequence
	• Implemented and tested evaporators at P-Area to reduce saline contact water volumes stored at surface • Constructed trenches down gradient from DP1-B and DP3-A to be able to pump collected water and pump back to P1 and P3, respectively • Constructed Channel 5 • Installed Culverts 3 and 4
Yr -3 **(2017)**	• Completed construction of D-CP1, jetty and Pumping station CP1 • Completed construction of D-CP5, jetty and Pumping station CP5 • Started construction Channel 1 • Constructed Berm 3 • Constructed freshwater intake in Meliadine Lake and installed pumping station • Constructed Lv75 water stope for additional underground saline contact water storage • Installed Culvert 13 • Started to treat sewage from Sewage Treatment Plant (STP) and pump the treated sewage from STP to CP1 • Started to pump the surface contact water from CP5 to CP1 for treatment (solids removal) • Started to pump water collected in trenches, down gradient from D-CP1, D-CP5, DP1 and DP3 to the associated containment pond • Started to pump the water from the Type A Landfarm to CP1 after oil/water separator treatment • Started to pump water from washbay to underground for storage until a biological treatment unit for hydrocarbon reduction/removal arrives at the site
Yr -2 **(2018)**	• Completed construction of Channel 1 • Started construction Channel 3, Berm-CP3 and Pond CP3 • Installed Culverts 1, 2, 15 and 16 • Constructed Berm 2 • Started to pump the surface contact water from CP1 to EWTP for treatment prior to discharge via the diffuser to Meliadine Lake • Pumped the solids sludge from EWTP to CP1. To limit recirculation of the sludge within CP1, the discharge of the sludge was located away from the EWTP intake • Started diversion of surface contact water from industrial pad to CP1 via Channel 1 • Constructed and commissioned (in Q4) SWTP to discharge to CP1.
Yr -1 **(2019)**	• Constructed Saline Pond 2 within footprint of Tiriganiaq Pit 2 and began storing excess saline contact water • Installed culverts 7, 8, 10, 11 and 20 • Constructed Channels 7 and 8 and Berm 1 • Completed construction of Channel 3, Berm-CP3 and Pond CP3 and started to collect surface contact water • Constructed Channel 4, Pond CP4 and Berm-CP4 and started to collect surface contact water • Started to pump the surface contact water in Ponds CP3 and CP4 to the partially drained Pond H13 where the water flows through Channel 1 into CP1

Mine Year	Major Water Management Activities and Sequence
	• Constructed, commissioned, and started discharge of saline water through the discharge to sea diffuser system • Partially dewatered Ponds H19 and H20 in Q3 of Year -1 by pumping water to the EWTP for discharge to Meliadine Lake • Started construction of Saline Pond 4 (SP4) within footprint of Tiriganiaq Pit 1
Yr 1 (2020)	• Completed construction of SP4 • Constructed Pond CP6 and Berm-CP6 • Transferred SP2 into SP4 • Decommissioning of evaporators • Started to pump surface contact water in CP6 to CP1 • Started to pump surface contact water collected in Tiriganiaq Pit 2 to CP5 • Started decommissioning of P1 and P2 (P-Area) by backfilling with waste rock • Decommissioning of SWTP
Yr 2 (2021)	• Start to pump surface contact water collected in Tiriganiaq Pit 1 to Tiriganiaq Pit 2 • Construct and commission EWTP within WTC (EWTP-WTC) • Complete conversion of Tiriganiaq Pit 2 to saline contact water storage facility • Dewater SP4 and SP1 into Tiriganiaq Pit 2 • Start pumping excess saline contact water from underground mine to Tiriganiaq Pit 2 • Finish decommissioning P1 and P2 (P-Area) by backfilling with waste rock • Pump EWTP and SETP sludge to saline contact water storage
Yr 3 (2022)	• Constructed Pond CP2 and Berm CP2 • Constructed Channels 9 and 10 • Store marginally saline water into SP1 • Pump water from Tiriganiaq Pit 1 to CPs, SP1, or Tiriganiaq Pit 2 • Operation of the RO plant for treatment of marginally saline water on site • Continued pumping saline contact water from underground mine to Tiriganiaq Pit 2 • SETP upgrade installation at the WTC
Yr 4 (2023)	• Channel 3 remediation work completed • Channel 2 outlet berm constructed • Start of waterline installation (AWAR KM 15 to 30)
Yr 5 (2024)	• Continued waterline installation • SETP-WTC commissioning
Yr 6 (2025)	• Anticipated Waterline commissioning • SETP-WTC discharge through waterline
Yr 7 (2026)	• SETP-WTC discharge through waterline
Yr 8 (2027)	• SETP-WTC discharge through waterline • Start to fill the mined-out Tiriganiaq Pits 1 and 2 with active freshwater pumping from Meliadine Lake

Mine Year	Major Water Management Activities and Sequence
	• Stop pumping excess saline contact water from underground when underground mine is completed • Start natural flooding of Tiriganiaq Underground mine with groundwater seepage • Stop pumping water to process plant when the processing is completed

4.1.1. Pond Dewatering and Displacement

The initial dewatering at Lake H17 and Lake A54 was conducted in 2016 prior to constructing CP1 and CP5, respectively. The water from these ponds was pumped to Meliadine Lake through a temporarily installed diffuser.

Preparation for construction of CP4 facility required dewatering of the two shallow ponds B8 and B9 into CP1. Preparation for CP3 did not require dewatering as B28 contained insufficient volumes to dewater.

In Q3 2019, partial dewatering of Ponds H19 and H20 to the EWTP took place, following the advanced timeline for the construction of CP6 and WRSF3. Specifically, H19 was partially dewatered to facilitate construction of Berm CP6, while H20 was partially dewatered to allow the placement of waste rock and overburden within the drained lake basin. Detailed information regarding the CP6 design and subsurface thermal analysis can be found in the CP6 and Berm Design Report (Tetra Tech, 2020).

In Q3 2022, lakes A9, A38, A40, B33, and B33A were dewatered to allow for the continued mining within the final footprint of Tiriganiaq Pit 1, as authorized by DFO in a letter on April 20, 2022 (file 21-HCAA-02733). Water was pumped into the site water management collection ponds before being treated by the EWTP and discharged to Meliadine Lake. The final dewatering report was provided by Agnico Eagle to KivIA and DFO on October 21st, 2022.

Table 11 summarizes the pond dimensions, dewatering date, and estimated dewatered volumes.

Table 11: Estimated Pond Dewatering Schedule

Pond	B8	B9	H20	H19	A9	A38	A40	B33	B33A
Maximum Pond Water Depth (m)	-	1.4	1.6	1.4	-	-	-	-	-
Existing Pond Surface Area (ha)	-	0.63	9.58	2.91	1.77	0.55	0.82	0.67	0.35
Dewatering Schedule	Q4 2018	Q4 2018	Q3 2019	Q3 2019	Q3 2022	Q3 2022	Q3 2022	Q3 2022	Q3 2022
Volume of Water Dewatered (m^3)	2,993	6,840	90,307	16,431	719	2,070	4,182	3,311	732

4.1.2. Underground Water Management

The Underground Mine will extend approximately 700 m below the ground surface and part of the underground workings will be operated below the base of continuous permafrost. The underground excavations act as a sink for groundwater flow during mining, with water induced to flow through the bedrock to the Underground Mine workings below the base of the permafrost.

The underground water management system is designed to prevent water from affecting the workings or production. The system contains a series of sumps (generally one at the access of each level) designed to capture groundwater inflows and runoff from mining operations (i.e., drilling), a clarification system, and a pumping system to redistribute the clarified saline contact water. Excess saline contact water is pumped to surface to be managed in Tiriganiaq Pit 2. Temporarily inactive underground developments (similar to the water stope) are used for additional storage of excess underground water as required. Further details on the underground water management system are provided in the Groundwater Management Plan.

Beginning December 2018, the SWTP began treating groundwater to reduce stored saline contact water on site (See Section 3 for details). Furthermore, as part of the strategy to manage excess groundwater infiltration within the underground portion of the mine, Agnico Eagle received approval for marine discharge of saline water with the amended Project Certificate on February 26, 2019 (See Section 3.11 and Appendix A for details). A new amendment (Amendment 002 of the NIRB Project Certificate No. 006) was received March 2nd 2022 allowing the discharge of treated saline water through a waterline.

Table 12 presents the predicted groundwater inflow rates estimated for passive groundwater inflow to the Underground Mine (WSP, 2024b). Details pertaining to model inputs and assumptions are found in Appendix A. Details pertaining to groundwater monitoring are also provided in Appendix A. Values presented in Table 12 do not account for grouting efforts.

Table 12: Predicted Groundwater Inflow to the Underground Mine (2017 to 2033)

Year	Predicted Groundwater Inflow (m^3/day)	Predicted TDS (mg/L)
2023	300	57,500
2024	450	57,000
2025	450	57,000
2026	475	56,500
2027	475	56,500
2028	450	56,500
2029	475	54,000
2020	475	53,500
2031	475	53,500

Year	Predicted Groundwater Inflow (m^3/day)	Predicted TDS (mg/L)
2032	450	53,500
2033	450	53,500

4.1.3. Water Management for Haul Road

A network of roads provide access to infrastructure at the Mine. The majority of the roadways servicing the mining area are located so that drainage is directed by berms, channels and culverts towards CP1, CP2, CP3, CP4, CP5, and CP6. Detailed information about water management on roads is described in the Roads Management Plan (Agnico Eagle, 2024).

4.1.4. Water Management for Landfarm and Landfill

Any water that accumulates at the onsite Landfarm is pumped through an oil-water separator prior to discharge into CP1. Additional details for Landfarm water management are described in the Landfarm Management Plan.

Leachate from the Landfill is anticipated to be non-hazardous and non-toxic due to the controls put in place on the materials accepted for deposition in the Landfill. Annual Landfill operations involves clearing of snow prior to spring melt. In the event there is leachate from the Landfill due to periods of heavy rainfall or spring freshet, the runoff will be collected, controlled and treated, if necessary, and sent to CP1, as per the Landfill Management Plan.

The design of the Operation Landfill (Stage 1) (Tetra Tech, 2017A) did not include a water collection system, as internal runoff captured by the Landfill was expected to gradually seep through the northeast perimeter berm, where it would naturally flow to Pond H13 to be managed by the existing Mine water management system. However, the addition of material to the existing berms for each landfill expansion stage is expected to have caused permafrost to aggrade within the berms, inhibiting seepage by reducing the hydraulic permeability of the berms.

The Operation Landfill (Stage 4) will utilize a pumping system to facilitate the removal of water that may pond within the Landfill if the rate of seepage is insufficient. The proposed pumping system will include corrugated metal pipes installed within the Landfill and a pump with a minimum flow rate of 25 m3/hr. Water pumped from the Landfill will be directed to Pond H13, which is the current location where seepage reports from the Landfill.

Monitoring of seepage from the Landfill (between the Landfill and Pond H13) is conducted at compliance monitoring station MEL-24. As such, an application for modification to the Licence was made to include the monitoring of water pumped from the Landfill towards Pond H13 within the description of the monitoring station MEL-24. In August 2023, the NWB issued approval for the change in the Licence.

4.1.5. Water Management for Emulsion Plant Area

Freshwater is trucked to the emulsion plant and used for manufacturing emulsion as well as for washing vehicles. Water within the emulsion plant is re-used when feasible, and excess water is collected and disposed of on site (i.e., STP) or stored and shipped south as hazmat.

4.1.6. Water Management for the Wash Bay

Water used in the Wash Bay is re-used when feasible and excess water is treated with an oil-water separator to reduce or remove hydrocarbons. Treated water is moved to CP1 or the surface saline ponds, depending on *in situ* specific conductivity applied to approximate TDS concentration. Solid waste from the treatment process is removed and disposed of appropriately (Landfarm, hazmat, or underground).

4.2. Freshwater and Sewage Management

Additional freshwater usage and sewage management is described in the following sections.

4.2.1. Freshwater Management

Major freshwater usages on site include potable use, fire suppression, make-up water for the mill, and other operational needs, such as drilling and paste production for backfill. Freshwater is sourced from Meliadine Lake through a freshwater intake and pump system. For dust suppression, water is sourced from the freshwater intake system, ponded water located along the AWAR, or small ponds proximal to the road. Surface contact water from the site is applied as dust suppression within the site surface contact water system catchment.

Freshwater is pumped through an overland pipeline to potable water storage tanks and a fire water suppression tank. Under the Amended Licence, 742,000 m^3/year of freshwater is permitted during operation phase. Additionally, approximately 4,000,000 m^3 of freshwater is permitted per year to fill the mined-out open pits during the mine closure. These quantities are inclusive of water needs for dust suppression.

The maximum design flow rate for the potable water for the main camp and accommodations (kitchen, laundry) is 216 m^3 per day. There is an onsite Potable Water Treatment System (Section 3.9.1). Treated potable water is piped to areas in the service complex and other facilities requiring potable water.

4.2.2. Sewage Management

Sewage collected from the camp and MSB facilities is pumped to the STP. The objective of the STP is to treat sewage to an acceptable level for discharge to CP1 via a treated sewage water discharge pipeline. The STP is housed in a prefabricated (modular) structure, located at south-east of the service complex at the Industrial Pad, as shown in Figure 2. The system is designed to treat a maximum daily flow of 299 m^3 per day.

The STP for the camp facilities is designed to meet appropriate guidelines for wastewater discharge (Agnico Eagle, 2020c). Details regarding STP specifications and operation can be found in the Operation & Maintenance Manual Sewage Treatment Plant (Agnico Eagle, 2021a).

4.2.3. Process Water Management

Process water is required in the mill for ore processing and is primarily sourced from Meliadine Lake through the freshwater intake system. Fresh water required for milling is not expected to exceed the permitted annual freshwater consumption limit of 742,000 m^3 when combined with other sources of consumption. As per the Licence, reclaim of surface contact water for use at the Mill is maximized to the greatest practical extent.

4.3. Meliadine Lake Diffuser Effluent Rates

The EWTP is designed to meet the minimum required rate of 12,000 m^3/d per the design requirements of dike D-CP1 (Tetra Tech, 2016b). While the EWTP equipment has an operational range up to 28,000 m^3/d, the current system is configured to operate a maximum discharge rate of 18,000 m^3/d to prevent over-pressuring in the HDPE line that conveys water from the EWTP to the diffuser.

The pump does not operate continuously at the maximum rate. The rate of discharge is actively determined during the open water season based on meeting the design criteria and performance objectives of D-CP1. The anticipated amount of effluent requiring discharge over each month per year can be found in the Water Balance and Water Quality Model (WBWQM) Results in section 3.2 of the most recent Annual Report submission. Details on the WBWQM setup and methods are discussed in section 5 of the WMP.

Discharge to Meliadine Lake is expected to be required on an annual basis. However, discharge of surface contact water through the waterline to Itivia Harbour will be conducted in accordance with the Adaptive Management Plan to minimize discharge to Meliadine Lake once the waterline is operational. Additional details can be found in Section 3.2 of the most recent submission of the Annual Report and in the Adaptive Management Plan for Water Management (Agnico Eagle, 2022).

SECTION 5 • WATER BALANCE

5.1. Site Water Balance Model

In 2014, a site water balance model was developed to assist in the evaluation of the water management infrastructure and estimation of the pumping requirements over the life of the Mine and under closure conditions (Tetra Tech, 2014). The model focused specifically on contact water management infrastructure and areas that are affected by mining activities. The model applied a monthly site-wide water balance for CP1, CP3, CP4, CP5, CP6, Tiriganiaq Pit 1, Tiriganiaq Pit 2, water in the underground mine operation, make-up water for the mill, water for the WTPs, and freshwater during mine construction to mine closure under mean precipitation years.

An update to the water balance was carried out by Golder (2020b) in support of the Water Licence Amendment application, including the incorporation of CP2. The water balance results were provided in the Water Licence Amendment Application and in the 2020 Annual Report.

In 2021, a revised Water Balance and Water Quality Model (WBWQM) was developed by Lorax Environmental Service Ltd. for Agnico Eagle. The main changes to the new model were the use of the GoldSim modelling platform with a revised framework and revised inputs from previous models.

Per Part E, Item 13 of the Licence, the WBWQM is updated at minimum of once every year. The results of the annual updates, along with comparisons of Mean Annual Concentrations in relation to the thresholds identified in Part E, Item 13 of the Licence, are discussed in the Annual Report.

The following sections present the framework of the WBWQM including the model setup and model methods.

5.2. Model Setup

The WBWQM is built in the GoldSim v14 software platform and is set-up to run on a daily time-step. The primary modelling objective is the prediction of water and solute load transfers within the mine site, and to the receiving environment. The GoldSim WBWQM is configured to predict the transfer of water and solute mass (loadings) from mined and non-contact areas into the relevant water management facilities. All mixing is assumed to occur instantly, and all mass is conserved throughout the model (i.e., no attenuation is applied to any of the parameters that are tracked).

5.3. Water Management Assumptions and Inputs

Details of the surface contact water management strategy are described in section 4 above, while the detailed saline groundwater management can be found in the Groundwater Management Plan (GWMP). The general flow network used in the WBWQM is shown in Figure 5.

5.3.1. Pond Pumping Rates

The model assumes pumping rates between CP2, CP3, CP4, CP5, and CP6 to CP1, as well as pumping rates between saline ponds such as SP1, SP4, P3, and Tiri 02 are based on maximum designed pumping rates for each facility while factoring in historic pumping data. Pumping demand is assumed to occur continuously throughout the open water season, from the start of June to the end of October. Historical quantities of recorded pumping rates between surface ponds since 2018 are applied to the model.

5.3.2. Discharge to Itivia Harbour

Currently, saline water from the underground mine is stored in Tiriganiaq Open Pit 2 (Tiri 02) and as such no discharge quantities are applied to the model until the waterline commissioning. Only previous discharges of saline water from SP4 to Itivia Harbour by trucking are applied to the WBWQM. The model assumes the waterline will be operational beginning in 2025 with a seasonal discharge from June 20th to September 29th at 20,000 m^3/day. Availability of the waterline is assumed to be 70% (i.e., 14,000 m^3/day) to provide conservativism with any operational challenges. This assumption will allow for maintenance throughout the operation period and other planned or unplanned shutdowns.

5.3.3. Discharge to Meliadine Lake

Currently, treated surface contact water effluent from the EWTP is discharged to Meliadine Lake via a diffuser. The EWTP is modelled to have an annual discharge window of June 15th to October 7th at a rate of 15,300 m^3/day (18,000 m^3/day at 85% plant availability).

Surface contact water discharge to Meliadine Lake is minimized in favour of discharge through the waterline. However, the model assumes surface contact water discharge to Meliadine Lake will take priority if the volume of water in CP1 reaches 30% of the maximum operating volume of the facility (i.e., the upstream toe elevation of the dike), or if the volume of water in CP1 is above the maximum freeze-up volume between the window of October 1st to October 7th. These conditions allow for minimization of surface contact water to Meliadine Lake while respecting the design criteria of D-CP1 and other infrastructure.

5.3.4. Underground Mine Dewatering

Groundwater inflows represent the largest portion of water pumped from the Tiriganiaq underground mine to Tiri 02. Predictions of future underground inflow rates to the underground mine are generated using a 3D groundwater model (Golder, 2020b). The model was updated in early 2024 to consider updates to the underground mine development and to better reflect inflows estimated using measurements collected within the mine (see GWMP). A moisture content percentage is applied to a mine plan forecast of the monthly tonnes of ore and waste rock removed from the underground mine to represent entrained moisture being removed from the mine. A fixed quantity of freshwater used for paste line flushing is assumed per month. Additionally, a percentage of bleed-water from paste backfill is assumed and applied to forecasted tonnes of paste backfill.

5.3.5. Consumptive Freshwater Uses

Consumptive freshwater uses (e.g., paste plant, potable water, mill makeup, dust control, etc.) are supplied by withdrawal from Meliadine Lake. They are not included as direct inputs to the water balance model, as this additional water is already incorporated in various components of the mine water balance, such as sewage treatment plant discharge, seepage from placed tailings and paste backfill bleed-water reporting to underground workings.

5.3.6. Sewage Treatment Plant Discharge

The Sewage Treatment Plant (STP) is rated for a treatment rate of 299 m^3/day, and discharges to CP1, which is a conservative estimate of the treatment rates if compared to historical values.

5.3.7. Climate Inputs

The climate input series spans a 100-year period from 2020 to 2119, and consists of daily minimum, mean and maximum air temperature and precipitation values derived from the Rankin Inlet climate station, and adjusted to reflect future climate projections under the RCP4.5 representative concentration pathway (OKC, 2022a; 2022b). This station was shown to be representative of climate conditions as measured by the Meliadine climate station and given the much longer and more complete record at Rankin Inlet, this dataset was used to represent climate conditions at the Meliadine site (OKC, 2022a; 2022b). Mean annual precipitation in the RCP4.5 input series over the operations period is 396.4 mm, and on a monthly average basis, precipitation ranges from a minimum of approximately 14.8 mm in February to a maximum of 63 mm in September. The average annual air temperature is -10.4°C, with minimum and maximum mean temperatures of -34°C in January and 11°C in July, respectively.

Table 13 Average monthly climate conditions at Meliadine for the Operations Phase.

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Min. Temp (°C)	-31.7	-31.3	-26.0	-19.8	-8.0	2.3	7.5	7.8	1.7	-5.1	-15.4	-25.8	-31.7
Avg. Temp (°C)	-27.9	-27.7	-21.8	-15.7	-4.7	6.2	11.8	10.9	3.9	-2.8	-12.0	-22.3	-8.5
Max. Temp (°C)	-24.2	-24.2	-17.7	-11.5	-1.5	10.2	16.1	14.0	6.2	-0.5	-8.6	-18.7	16.1
Precipitation (mm)	18.6	14.8	21.4	22.3	24.2	37.6	42.0	49.1	63.2	37.4	39.5	26.2	396.4
Rain (mm)	0.0	0.0	0.0	0.0	3.4	28.0	40.7	49.7	52.4	18.9	0.8	0.0	193.9
% Rain	0%	0%	0%	0%	14%	74%	97%	100%	83%	51%	2%	0%	35%
Snow (mm)	18.4	11.6	20.6	20.7	20.9	3.5	0.0	0.0	3.5	24.4	34.8	34.3	192.8
% Snow	99%	78%	96%	93%	86%	9%	0%	0%	5%	65%	88%	100%	60%

5.3.8. Water Quality Model Component

The water quality model component of the WBWQM is built upon the architecture of the water balance model, with water quality signatures assigned to non-contact (undisturbed) areas and to specific disturbed mine areas (e.g., infrastructure, stockpiles, tailing facilities, underground mine, open pits). Water quality inputs to the water quality model, or source terms, are based on either a set of assumptions that reflect empirical observations from the operating mine site, data collected at analogue mine sites, or the results of various geochemical and metallurgical tests that have been undertaken to provide a basis for assigning likely future water quality associated with specific mine components. Conceptually, modelled flows and associated source terms are combined in the GoldSim platform to simulate predicted water quality estimates at key locations across the mine site (Lorax, 2022). The WQM is set-up to run on a daily time-step for the period of 2019 to 2027, consistent with the water balance sub-model. Concentrations of water quality parameters required by Type A Water Licence 2AM-MEL1631 Part F, Item 3 are modelled for all mine water management ponds and sumps, that receive runoff from the different mine areas. WQM outputs are either compared on a daily time-step with the in-situ measured water quality values or aggregated on an annual time-step, and are screened against required water quality objectives (Water License Part E Section 13).

5.4. Water Balance Model Methods

This section summarizes the approach, assumptions, conceptual model and inputs used to construct the site-wide water balance model.

5.4.1. Approach and Assumptions

The site-wide water balance model (WBM) is set-up to represent the interaction of the local climatic regime with the mine plan and WMP, and based on these interactions, to predict the volumes of various water types (i.e., non-contact, surface contact and saline contact) requiring management, treatment and discharge to the receiving environment. Given the potential for upset conditions to occur on sub-monthly time scales (i.e., high magnitude rainfall events, rapid freshet), and the operational necessity of managing mine contact waters on a daily basis, the WBM is set-up to run on a daily time-step.

5.4.2. Sub-catchment Delineation

To generate water volume estimates from precipitation inputs, the delineation of both the natural and mine-altered watershed areas was necessary for modelling the locations of interest. The catchment areas by year are presented in Table 14. Sub-catchment nomenclature was based on the water management feature that each mine component reports to via gravity drainage. For example, ‘CP1-Natural’ refers to the non-contact area drainage that reports to the CP1.

Table 14 Catchment area by facility.

Facility / Footprints (ha)	Runoff Types	Source Term	2019	2020	2021	2022	2023 - 2026	2027 - Post
CP1-Facilities-1,2 and 3	Hard Surface	Mine Facilities	43.04	43.04	45.90	31.98	31.98	31.98
CP1-Landfill	Hard Surface	Mine Facilities	-	-	-	1.66	1.66	1.66
CP1-Laydown	Hard Surface	Mine Facilities	-	-	-	7.61	7.61	7.61
CP1-Natural (direct to CP1)	Natural	Baseline	6.73	6.73	6.73	6.73	6.73	6.70
CP1-Natural (to channel 1)	Disturbed	Disturbed	55.54	52.53	46.86	37.74	28.61	28.61
CP1-OP2	Waste Rock	Ore Stockpile	11.04	11.04	11.04	11.04	11.04	11.04
CP1-OP2-Ext	Waste Rock	Ore Stockpile	-	-	-	8.41	8.41	8.41
CP1-TSF	Tailings	TSF	8.68	9.36	9.76	9.76	12.67	12.67
CP1 - Collection Pond 1	Open Water	Precipitation	30.12	30.12	30.12	30.12	30.12	30.13
CP1-WRSF1	Waste Rock	WRSF1	2.75	4.65	10.60	10.60	10.60	10.60
CP1-Tem OVB	Disturbed	Disturbed	-	-	-	1.75	1.75	1.75
D-CP1	Disturbed	Disturbed	-	-	2.92	2.92	2.92	2.92
CP2-Natural	Natural	Baseline	-	-	-	7.57	7.57	7.57
CP2-Water	Open Water	Precipitation	-	-	-	2.55	2.55	2.55
CP2-WRSF3-EXT	Waste Rock	WRSF3	-	-	-	23.78	23.78	23.78
CP3-Disturbed	Disturbed	Disturbed	1.86	0.00	0.00	0.00	0.00	0.00
CP3-Berm	Hard Surface	Mine Facilities	1.41	1.41	1.41	1.41	1.41	1.41
CP3-Natural	Disturbed	Disturbed	20.87	18.61	17.30	17.30	9.18	9.18
CP3-TSF	Tailings	TSF	8.46	12.58	13.89	13.89	22.01	22.01
CP3 - Collection Pond 3	Open Water	Precipitation	1.66	1.66	1.66	1.66	1.66	1.66
CP4-Berm	Hard Surface	Mine Facilities	2.95	2.95	2.95	2.95	2.95	2.95
CP4-Natural	Disturbed	Disturbed	30.48	25.89	11.27	11.27	11.27	11.27
CP4-Collection Pond 4	Open Water	Precipitation	1.19	1.19	1.19	1.19	1.19	1.19
CP4-WRSF1	Waste Rock	WRSF1	3.52	8.56	17.27	17.27	17.27	17.27
CP5-Disturbed	Disturbed	Disturbed	22.21	21.51	20.61	20.61	20.61	20.61
CP5-Facilities	Hard Surface	Mine Facilities	20.55	18.37	18.05	18.05	18.05	18.05
CP5-Saline Ponds (water to Melvin Bay)	Open Water	Precipitation	1.91	1.91	1.91	1.91	1.91	1.91
CP5-Collection Pond 5	Open Water	Precipitation	5.07	5.07	5.07	5.07	5.07	5.07
CP5-WRSF1	Waste Rock	WRSF1	0.64	3.52	3.80	3.80	3.80	3.80
CP6-Berm	Hard Surface	Mine Facilities	0.00	2.80	2.80	3.92	3.92	3.92
CP6-Natural	Natural	Baseline	30.53	17.58	15.09	6.31	6.31	6.31
CP6-Collection Pond 6	Open Water	Precipitation	2.84	2.60	2.60	2.60	2.60	2.60
CP6-WRSF3	Waste Rock	WRSF3	0.00	21.74	23.96	33.00	33.00	33.00
CP6-Disturbed	Disturbed	Disturbed	9.38	0.00	0.00	0.00	0.00	0.00
TIR01 Open Pit	Pit Wall	Tiri01 PIt Wall	-	-	13.58	13.58	26.64	26.64

Facility / Footprints (ha)	Runoff Types	Source Term	2019	2020	2021	2022	2023 - 2026	2027 - Post
TIR01-Natural	Disturbed	Disturbed	-	-	6.55	6.55	5.01	5.01
TIR01-SP4 Saline Storage	Open Water	Precipitation	-	-	5.43	5.43	0.00	0.00
TIR02 Open Pit	Pit Wall	Tiri 02 Pit Wall	-	-	8.30	8.30	8.30	8.30
TIR02-Natural	Disturbed	Disturbed	-	-	6.74	6.74	6.74	8.67
TIR02-Stockpiles	Waste Rock	WRSF3	-	-	5.43	0.00	0.00	0.00
J6-Sump-WR	Disturbed	Disturbed	-	-	3.85	0.00	0.00	0.00

5.4.3. Runoff Flow Factors and Seepage

The model is based on a distributed catchment approach, where water volumes are estimated from water inputs (i.e., rainfall and snowmelt) and runoff coefficients calibrated for natural and mine altered areas.

For natural areas, a three-component flow system is used to simulate the delays in contribution from water inputs to surface waterbodies:

1. Quick flow: generated by storm or snowmelt events and often resulting in peak flow events. For tributaries local to the Meliadine Mine, water contributed via this mechanism may report to creeks in less than time than Interflow.
2. Interflow: this refers to the lateral movement of infiltrated meteoric water through the shallow overburden and active layer. Flow reporting to watercourses along this pathway is often referred to as vadose or unsaturated zone flow.
3. Baseflow: the portion of surface flow derived from groundwater discharge. At Meliadine, this flow component is understood to be negligible, and largely consists of water introduced via active layer melt.

The recharge of the Interflow and Baseflow components is governed by excess water from the previous component and a lag coefficient is applied to simulate the delayed response of the interflow and baseflow components. Quick flow and Interflow are considered as surface runoff while baseflow is considered as different components. Surface runoff computed for natural ground is adjusted using representative runoff coefficients for the altered mine areas. Future estimates of surface runoff, infiltration, interflow and basal seepage from the TSF and WRSFs were modelled by OKC (OKC 2022a; 2022b) for the RCP4.5 climate change scenario and provided at a daily time-step for direct input to the WBWQM. For some specific mine perturbed areas, only the quick flow component is used, and the natural runoff coefficient is adapted/calibrated to the characteristics of the perturbed surface.

5.4.4. Potential Evapotranspiration

Hargreaves-Samani method (Hargreaves and Samani 1985) was used to develop estimates of potential evaporation, using the long-term daily record of minimum, average and maximum daily temperatures, as well as factors related to potential solar insolation (e.g., latitude [63.08°] and day of year).

5.4.5. Lake Ice Growth and Ice Melt

A temperature-based ice algorithm was implemented to model cryo-concentration in CP1. Lake ice melt is handled by the Bilello equation (Bilello, 1980; Lotsari et al. 2019). The lake ice growth algorithm is not applied to any other facilities than CP1, including saline storage facilities (i.e., Tiri 02, SP1, SP4, and P3).

5.5. Waterbody Inventory

Table 15 presents the four watersheds (Watershed A, Watershed B, Watershed H and Watershed J) and various waterbodies that are impacted by the Mine activities. Watersheds and waterbodies in proximity to the Mine location and waterbodies affected by Mine infrastructure are shown on Figure 6.

Table 15: Inventory of Waterbodies Impacted by Mining Activities

Watershed	Waterbody	Maximum Lake Water Depth, m	Total Area (ha)	Water Volume (m^3)	Notes
A	A9	N/A	0.18	-	Pond removed for Tiriganiaq Pit 1 slope stability
	A10	0.67	0.26	-	Ponds removed by development of Tiriganiaq Pit 1
	A11	0.45	0.40	-	
	A12	0.87	0.47	-	Pond drained due to construction of Channel 5
	A13	0.30	0.26	-	
	A17	0.30	0.16	-	Covered by WRSF 1
	A38	N/A	0.05	-	Pond removed for Tiriganiaq Pit 1 slope stability
	A39	0.48	0.12	-	Pond removed by development of Tiriganiaq Pit 2
	A40				Pond removed for Tiriganiaq Pit 1 slope stability
	A54	1.3	5.99	34,545	Dewatered for CP5
	A58	0.50	0.43	-	Covered by Laydown Area
B	B8	0.8	1.43	-	As part of CP4/Berm-CP4
	B9	1.40	0.64	-	Dewatered for CP4
	B10	0.8	0.33	-	Pond removed by development of Tiriganiaq Pit 1
	B28	N/A	0.45	-	As part of CP3/D-CP3
	B33				Pond removed for Tiriganiaq Pit 1 slope stability

Watershed	Waterbody	Maximum Lake Water Depth, m	Total Area (ha)	Water Volume (m^3)	Notes
	B33A				Pond removed for Tiriganiaq Pit 1 slope stability
H	H6	0.58	0.75	-	As part of CP1
	H7	0.67	0.11	-	
	H8	0.59	0.38	-	Partially covered by WRSF2 and haul road
	H9	0.40	0.42	-	Partially covered by OP2
	H10	0.11	0.10	-	Partially covered by OP2, drained due to construction of Channel1
	H11	0.27	0.28	-	
	H12	0.81	0.97	-	Drained due to construction of Channel1 and partially covered by OP2
	H13	1.04	3.49	-	Drained due to construction of Channel1 and partially covered by industrial pad
	H14A	0.37	0.15	-	Covered by industrial pad
	H15D	0.30	0.15	-	Partially covered by TSF
	H15G	0.40	0.38	-	
	H17	1.70	15.8	195,700	Dewatered for CP1
	H17A	1.50	0.13	1,365	Dewatered for Meliadine esker
	H17B	1.50	0.69	10,350	Dewatered for Meliadine esker
	H17C	1.50	0.23	3,450	Dewatered for Meliadine esker
	H18	0.67	0.74	-	Covered by OP2
	H19	1.40	2.91	16,431	Dewatered for CP6
	H20	1.60	9.58	90,307	Covered by WRSF3
J	J6				Flow regime impacted by partial pad covering

"-" indicates that data not available or not applicable; [grey] Ponds to be drained; [beige] Ponds to be dewatered

SECTION 6 • WATER QUALITY

Water quality monitoring is an important part of the Water Management Plan to verify the predicted water quality trends, conduct adaptive management should differing trends be observed, and to ensure all water quality limits at discharge points are met (i.e., effluent to Meliadine Lake and Melvin Bay). Water quality results and water transfers (i.e., origin, destination, rate) at the Mine are monitored and documented pursuant the Licence.

Water quality monitoring was initiated at the pre-development stage, continued through construction into operations, and will continue into closure and post-closure. Monitoring occurs at four levels:

1. Regulated discharge monitoring that occurs at monitoring points specified in the Licence or MDMER regulations.
2. Verification monitoring that is undertaken for operational and water management purposes by Agnico Eagle.
3. General monitoring that is commonly included in the Licence, specifying what is to be monitored according to a schedule. General monitoring is subject to change as directed by an Inspector, or by the Licensee, subject to approval by the NWB.
4. Event Monitoring that addresses the site-specific monitoring that is required following any accidental release. The EM program is designed to verify whether contamination of the surface soil and/or any nearby receiving environment and active zone has occurred as a result of an accidental release of a hazardous material or contaminated water. A "release" may be caused by spills, including unidentified seepage or emergencies.

Water quality monitoring include quality assurance/quality control procedures that are implemented as per current Quality Assurance/Quality Control Plan. Appendix D details the Water Quality and Flow Monitoring Plan. Figure 7 and Figure 8 depict Monitoring Program Stations on Site and at Itivia.

6.1. Summary of Regulatory Guidelines

Water quality results are compared to MDMER criteria and effluent quality limits listed in the Licence. Water quality pertaining to MEL-14 will be compliant to Part F, Item 3 of the Licence prior to discharging to Meliadine Lake. All surface runoff and/or discharge from drainage management systems associated with the Mine, including laydown areas and All-Weather Access Road, where flow may directly or indirectly enter a Water body, shall not exceed the Effluent quality limits listed in Part D, Item 18 of the Licence. Furthermore, all waters from natural water body dewatering activities shall be directed to Meliadine Lake and shall not exceed the Effluent quality limits listed in Part D, Item 12.

Post-closure discharge water quality will be compared to Canadian Council of Ministers of the Environment Water Quality Guidelines (CCME-WQG) guidelines or the Meliadine SSWQO developed for aluminum, fluoride, and iron (Golder 2013a, 2013b, 2014). The Meliadine SSWQO criteria was developed as a conservative protection to the aquatic receiving environment and was developed by Golder (2013a, 2014) to assess whether waste rock consisted of a deleterious substance according to Environment Canada (2013). The outcome of the assessment was that Meliadine waste rock is not a deleterious substance (Environment Canada 2014).

6.2. Water Quality Monitoring - Licence Amendment

As a component of Amendment No. 1 (Emergency Amendment) and in support of the Water License Amendment Application for Amendment No. 2, additional regulated discharge monitoring was carried out in 2020, as described in the Water Quality Management and Optimization Plan (WQ-MOP; Golder 2020a). The purpose of the WQ-MOP sampling program was both to assess conditions experienced in Meliadine Lake during the 2020 discharge event and for the application as a science-based framework to support the determination of acceptable effluent quality conditions (EQCs) and Site-Specific Water Quality Objectives (SSWQOs). Further information regarding the WQ-MOP, including specifics of the 2020 sampling program, application of monitoring data, adaptive management measures and thresholds for the development of SSWQOs for chloride can be found in Golder (2021).

6.3. Water Quality Modelling and Forecasts

The water quality model component of the WBWQM is built upon the architecture of the water balance model, with water quality signatures assigned to non-contact (undisturbed) areas and mine infrastructure. Water quality inputs to the water quality model, or source terms, are based on either a set of assumptions that reflect empirical observations from the operating mine site, data collected at analogue mine sites, or the results of various geochemical and metallurgical tests that have been undertaken to provide a basis for assigning likely future water quality associated with specific mine components. Conceptually, modelled flows and associated source terms are combined in the GoldSim platform to simulate predicted water quality estimates at key locations across the mine site. The WQM is set-up to run on a daily time-step for the period of 2019 to 2027, consistent with the water balance sub-model. Concentrations of water quality parameters required by Type A Water Licence 2AM-MEL1631 Part F, Item 3 are modelled for all mine water management ponds and sumps.

As per the amended Licence, the water quality forecast will be updated annually. Future updates to the water quality forecast will be provided via annual reports.

6.4. Post-Closure

As per the 2014 Final Environmental Impact Statement (FEIS) water quality model provided in Agnico Eagle (2015b), long-term, post-closure water quality in the collection ponds (CP1, CP2, CP3, CP4, CP5, and CP6) and in the flooded open pit lakes are anticipated to meet MDMER limits and CCME-WQG for the protection of aquatic life or the SSWQO developed for the Mine for aluminum, fluoride, and iron. Arsenic concentrations in CP3 could slightly exceed the SSWQO post-closure, a criteria that is conservatively protective of the receiving aquatic environment (Golder, 2013a). If arsenic levels exceed post-closure SSWQOs then water arsenic treatment will be implemented accordingly until arsenic levels decrease below the SSWQO concentration.

SECTION 7 • WATER MANAGEMENT DURING CLOSURE

The detailed Mine closure and reclamation activities are provided in the Interim Closure and Reclamation Plan (SNC Lavalin, 2022). Water management during closure and reclamation will involve flooding the open pits using precipitation and freshwater from Meliadine Lake, flooding the Underground Mine workings with groundwater inflows (groundwater seepage), and maintaining contact water management systems on site until monitoring results demonstrate that water quality are 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 environment.

The key water management activities during Mine closure are summarized in Table 16. Figure 9 and Figure 10 illustrate the WMP during and after Mine closure, respectively. Additional details for the activities are described in the following sections.

Table 16: Key Water Management Activities during Mine Closure

Mine Year	Figure	Key Water Management Activities and Sequence
Yr 9 to 11 (2028 to 2030)	8	• Finish flooding the mined-out Tiriganiaq Pit 1 and Tiriganiaq Pit 2 by Q4 of Year 10 • Continue to collect and manage the contact water in CP1, CP2, CP3, CP4, CP5 and CP6 • Continue to pump the contact water in CP1 to EWTP, if required, for treatment before being discharged to the outside environment • Remove non-essential site infrastructure • Pump the underflow sludge water from EWTP to CP1 • Continue natural flooding of Tiriganiaq Underground Mine with groundwater seepage • Remove Meliadine Lake pumping system
Post-Closure	9	• Treat the contact water until water quality meet direct discharge criteria and then decommission the water management system • Continue natural flooding of Tiriganiaq Underground (progressive reclamation since Year 8) • Breach water retention dikes D-CP1, D-CP5, and thermal berms CP2, CP3, CP4, and CP6 once water quality monitoring results meet discharge criteria to allow water to naturally flow to outside environment • Remove culverts and breach remaining water retention berms in Year 18 (pending the demonstration of acceptable water quality)

7.1. Open Pits Flooding

When flooding the open pits for closure, the maximum pumping rate from Meliadine Lake shall not exceed 4,000,000 m^3/year during closure of the Mine, as stated in Part E Item 2 of the Licence. The planned pumping period will occur during the open water season from mid-June to end of September for each year. Table 17 summarizes the pit volume and expected water elevations at the completion of flooding activities. It will take approximately three years to fill the pits with an assumed pumping rate of 0.44 m^3/s (38,300 m^3/day). The assumed pumping rate of 0.44 m^3/s from Meliadine Lake during closure will have negligible effect to Meliadine Lake when compared to the average outflow rate at the outlet of Meliadine Lake. The pumping rate will be evaluated further to validate that any possible negative effects to Meliadine Lake do not occur.

Table 17: Pit and Underground Flooding

Pit	Volume (Mm^3)	Final Water Elevation (masl)	Water Source
Tiriganiaq Pit 1	9.20	64.14	Freshwater from Meliadine Lake
Tiriganiaq Pit 2	2.25	64.38	Freshwater from Meliadine Lake
Tiriganiaq Underground	1.4	Groundwater level	Groundwater seepage

The water quality model results indicated that water quality in the flooded pits will meet the discharge criteria and post closure treatment will not be required. The water quality within the pits will be monitored during flooding to verify the prediction of the water quality model. The information will be used to develop a strategy to minimize contamination of the regional surface water system.

7.2. Underground Mine Flooding

Passive flooding of the Tiriganiaq Underground Mine will occur following the completion of mining. The estimated total flooding volume of the underground workings is 1,372,000 m^3. Seepage water into the Underground Mine will be the main water source for flooding. At the predicted seepage rate it is estimated to take 6 years to flood the Underground Mine.

7.3. Collection Ponds, Dikes and Berms

The collection ponds, dikes and berms will remain in place to collect the surface runoff water and seepage from the Mine until the water quality meets discharge criteria. Once the water quality meets discharge criteria, dikes/berms will be breached to allow runoff to follow natural (topographically induced) flow paths. Dikes/berms breaching will involve the removal of a portion of the dikes to a minimum depth of 1 m below average water level or back to original ground levels. Consideration will be given to breach staging, with the above water portions of the dike/berm in the breach area removed during winter periods, when there will be little surface water flow, thereby minimizing the potential release of sediments to the neighbouring waterbodies. The remainder of the breach would be conducted during the open water season following freshet. Turbidity curtains would be deployed to minimize any potential sediment release to surface water.

7.4. Channels and Sumps

Once monitoring results have indicated that contact water conveyed in channels and sumps meets acceptable water quality, the infrastructure will be graded 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.

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FIGURES

Figure 1 : General Mine Site Location Plan

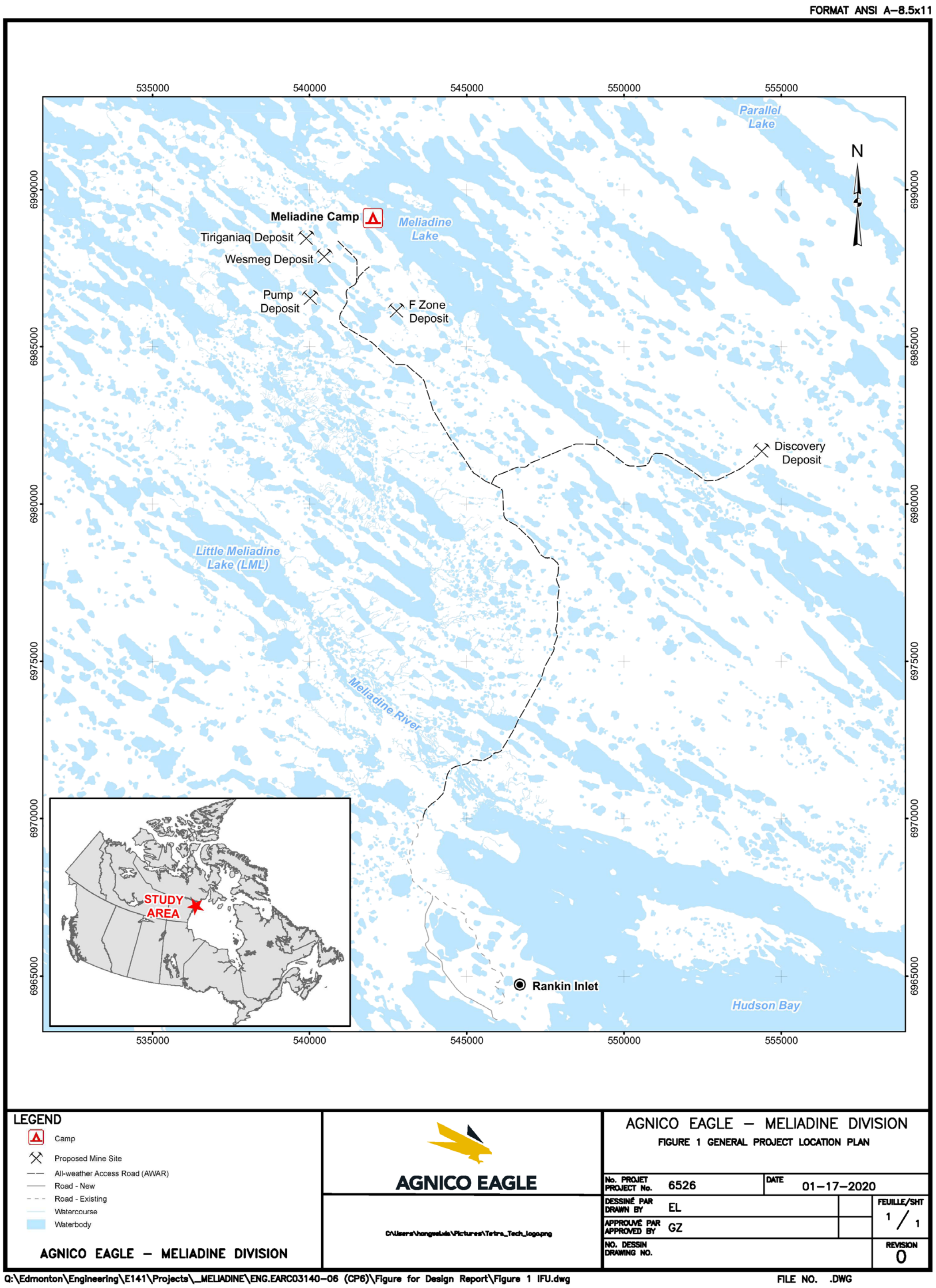

Figure 2: General Mine Site Plan Layout

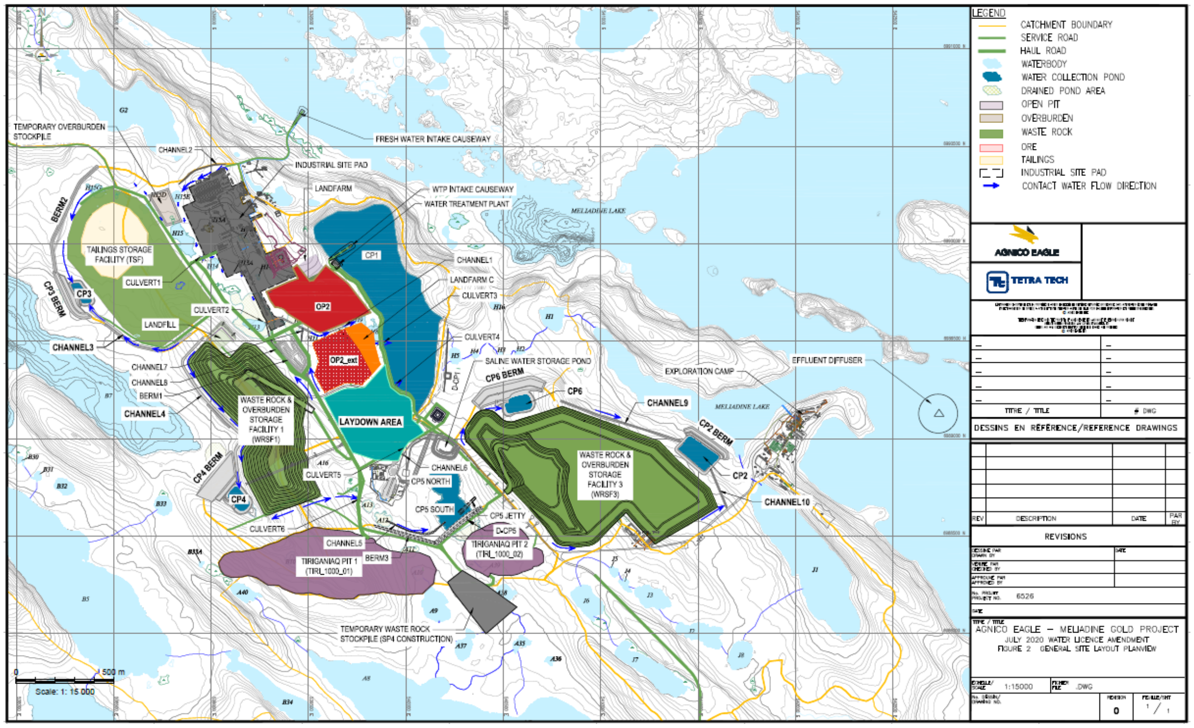

Figure 3: P-Area Plan View

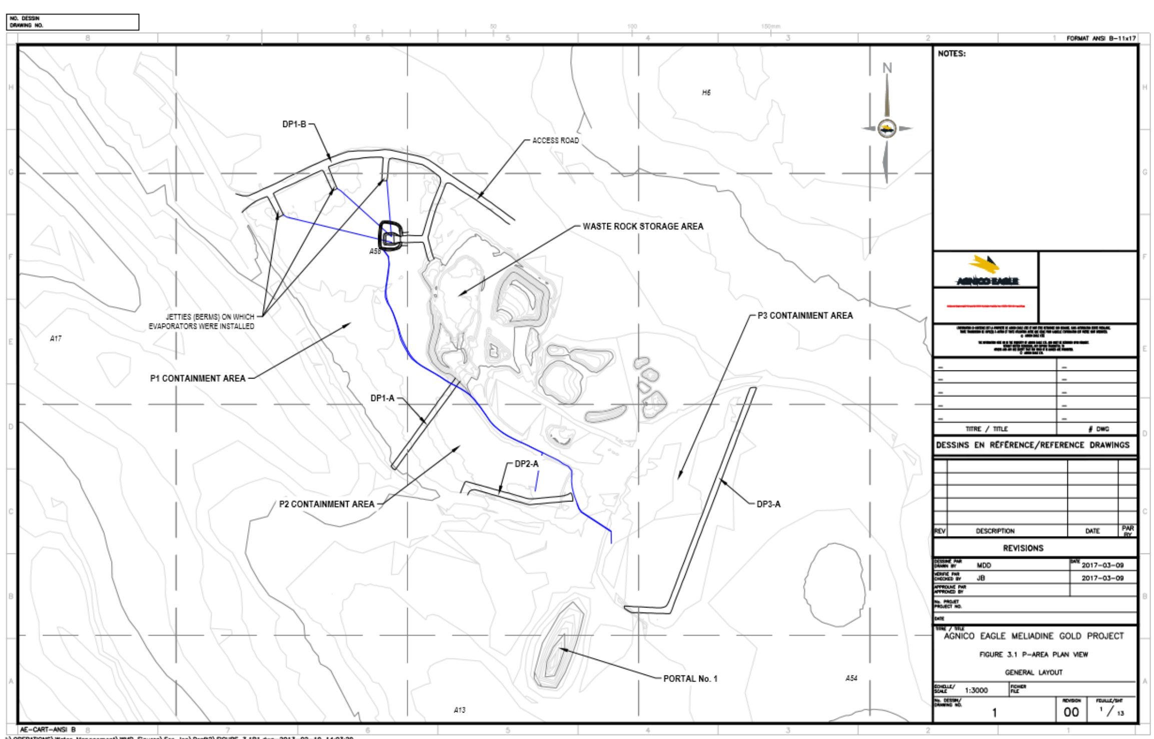

Figure 4: Location and design of Saline Pond 4 (SP4) within Tiriganiaq Pit 1

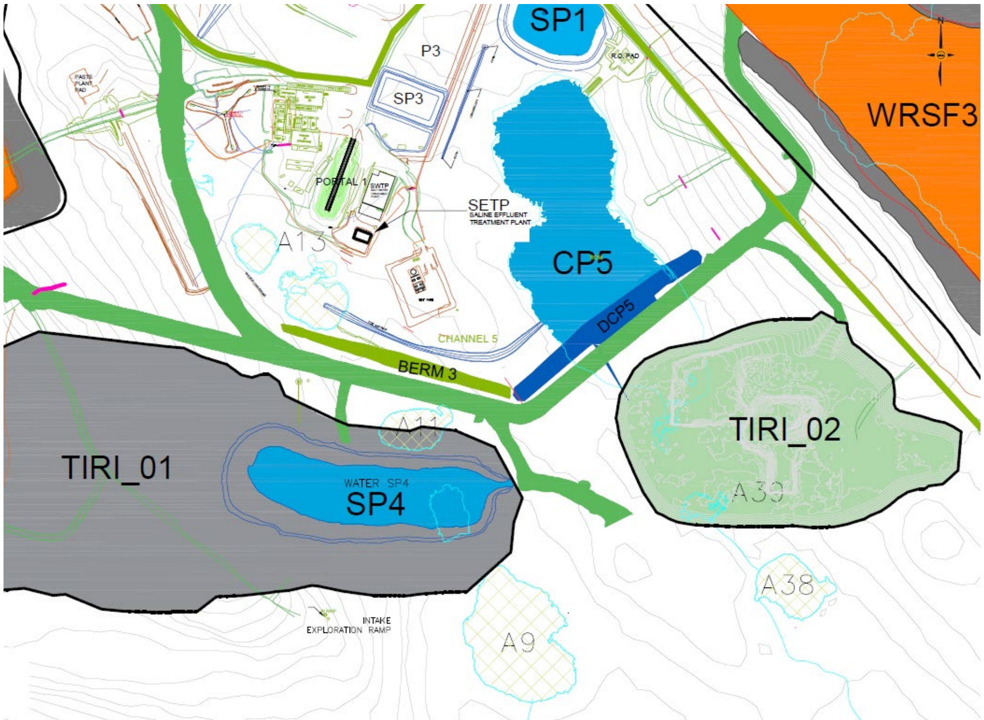

Figure 5 Conceptual site water management flow diagram for the site.

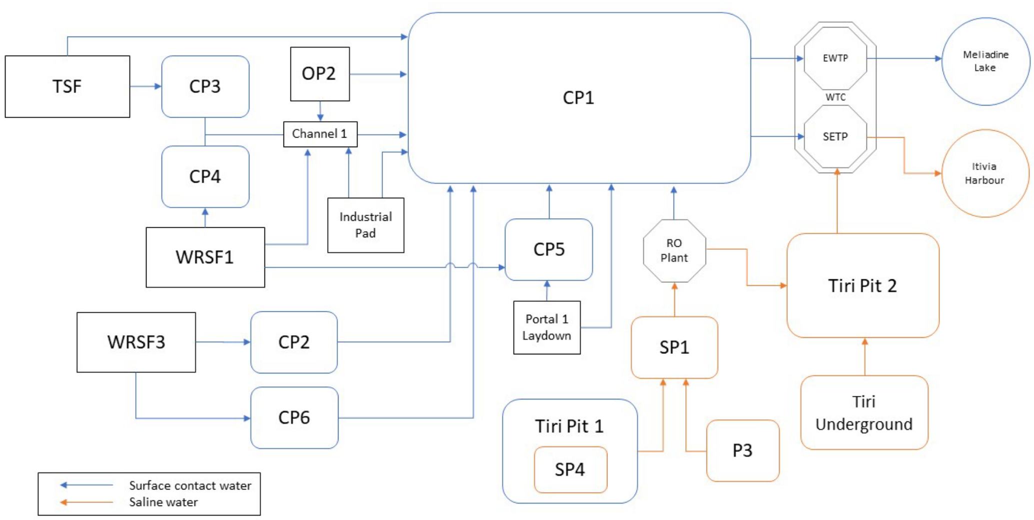

Figure 6: Watersheds and Waterbodies in Proximity of Mine Site

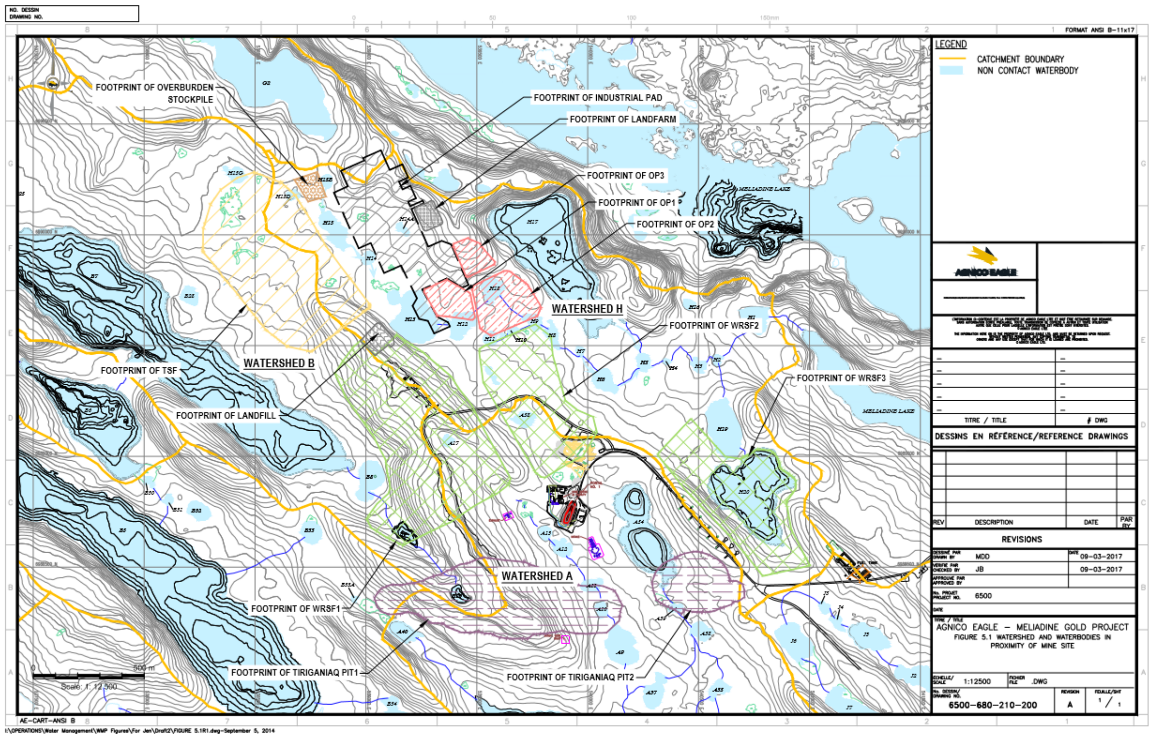

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Figure 7: Water Quality Monitoring Locations on Site

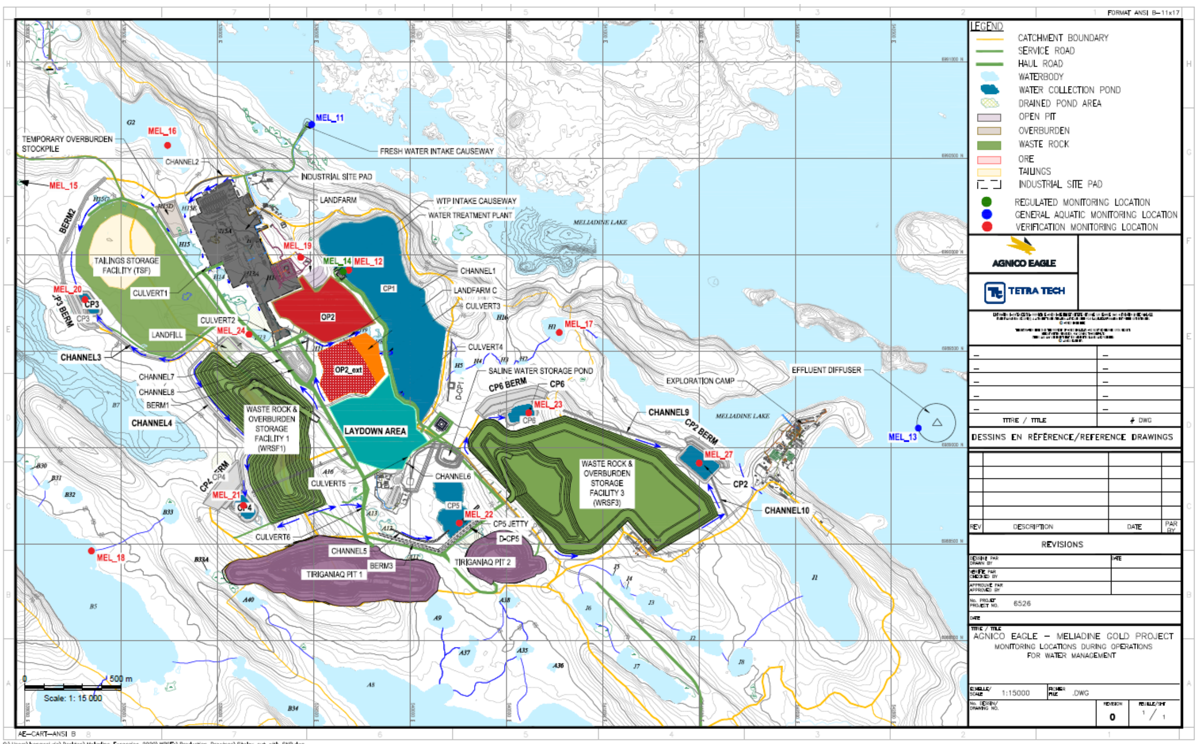


Figure 8: Water Quality Monitoring Locations at Itivia

Note – MEL-SR12 is located to the Northwest along the Bypass road but could not be effectively included in this map due to its distance from Itivia.

Figure 9: Mine Site Layout for Water Management During Closure

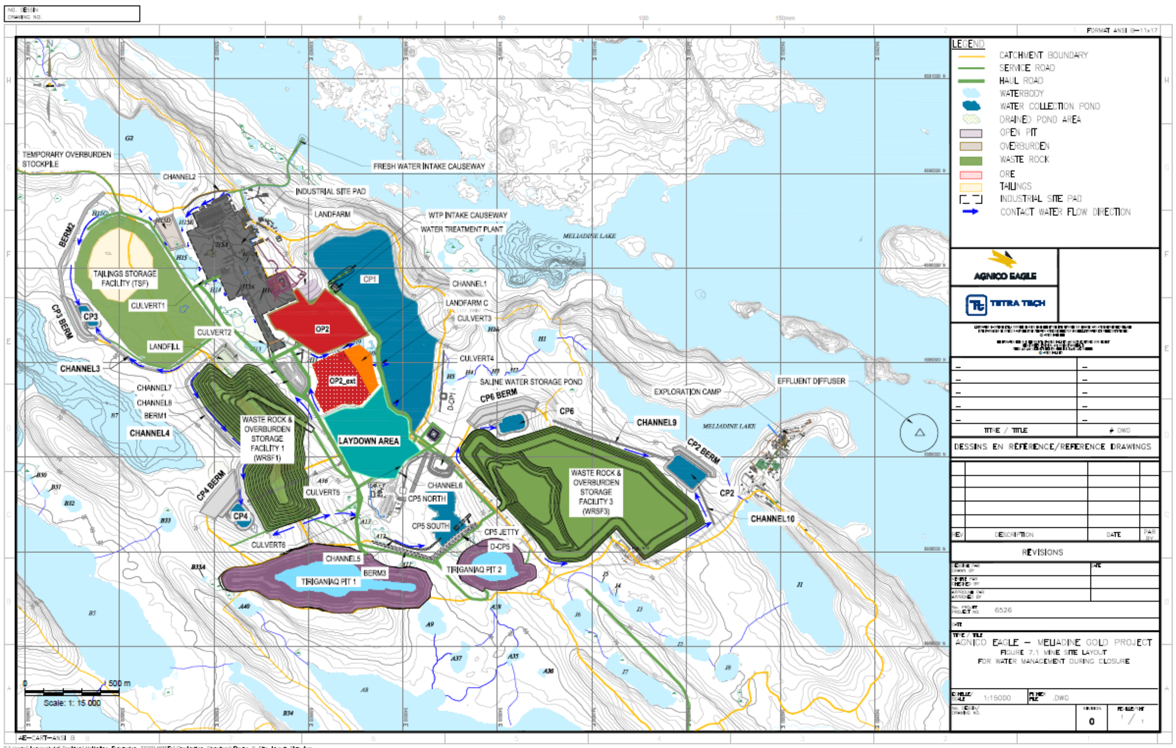
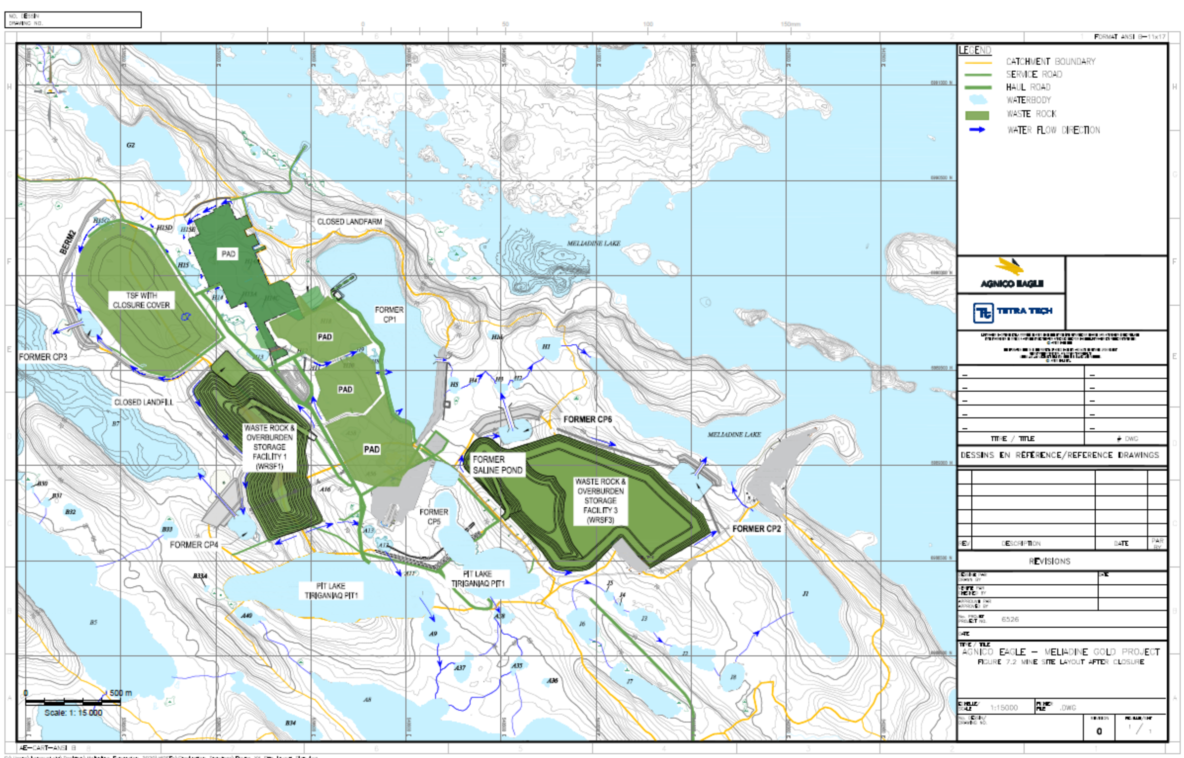


Figure 10: Mine Site Layout After Closure



APPENDIX A • MELIADINE GROUNDWATER MANAGEMENT PLAN

AGNICO EAGLE

MELIADINE GOLD MINE

Groundwater Management Plan

MARCH 2024
VERSION 11

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ᑎᑎᖅᖃᐅᑎᒦᑦᑐᑦ ᓄᓛᖕᒍᖅᑎᖅᓯᒪᔪᑦ ᐅᖅᑲᓖᒐᐃᑦ ᒪᓂᕋᕐᒥᑦ ᐃᒪᕐᒥᑦ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᑎᑎᕋᐅᑎᒥᑦ ᑲᑎᑦᑎᓂᕐᒧᑦ, ᐱᓕᕆᐊᖑᓂᖏᓐᓄᑦ, ᑐᖅᑯᖅᑕᐅᓂᖏᓐᓄᑦ, ᐊᒻᒪ ᑯᕕᑕᐅᓂᖏᓐᓄᑦ ᑕᕆᐅᓕᒃ ᒪᓂᕋᕐᒥᑦ ᐃᒪᖅ ᒪᓕᒃᓱᒋᑦ ᓄᓇᕗᒻᒥ ᐃᒪᓕᕆᔾᑯᓐᓂᑦ ᐋᖅᑭᒋᐊᖅᓯᒪᔪᖅ ᐃᒪᕐᒧᑦ ᓚᐃᓴᓐᓯ ᓈᓴᐅᑎ 2AM-MEL1631.

ᐊᒡᓃᑯ ᐄᒍ ᐅᔭᕋᒃᑕᓕᐊᓕᕆᔾᑯᑦ (ᐊᒡᓃᑯᒃᑯᑦ) ᐊᐅᓛᖅᑎᑦᑎᖃᑦᑕᖅᑐᑦ ᑕᓯᕐᔪᐊᕐᒥᑦ ᒎᓗᒧᑦ ᐅᔭᕋᒃᑕᓕᐊᕐᒥᑦ (ᐅᔭᕋᒃᑕᓕᐊᖅ), 25 ᑭᓛᒥᑕᓪᓗᐊᓂᒃ ᐅᖓᓯᒃᑎᒋᔪᖅ ᐅᐊᖓᓐᓇᖓᓂᑦ ᑲᖏᖅᖠᓂᐅᑉ, ᐊᒻᒪ 80 ᑭᓛᒥᑕᓂᒃ ᐅᖓᓯᒃᑎᒋᔪᖅ ᓂᒋᖅᐸᓯᐊᓂᑦ ᐱᖓᖓᖅᐸᓯᐊᓂᑦ ᐃᒡᓗᓕᒑᕐᔫᒃ ᑭᕙᓪᓕᕐᒥᑦ ᓄᓇᕗᒻᒥᑦ. ᐅᔭᕋᒃᑕᓕᐊᕐᒧᑦ ᐸᕐᓇᐅᑎ ᐅᔭᕋᒃᑕᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᖃᕈᓯᒪᔪᑦ ᓄᓇᒥᑦ ᐅᒃᑯᐃᖓᔪᒥᑦ ᐊᒻᒪ ᐊᑐᖅᑕᐅᓂᐊᖅᑐᓂᒃ ᐱᕙᓪᓕᐊᓗᒍ ᑎᕆᒐᓂᐊᖅ ᒎᓗᑕᓕᒃ, ᒪᕐᖀᖕᓂᒃ ᓄᓇᒥᑦ ᐅᒃᑯᐃᖓᔪᓂᑦ (ᑎᕆᒐᓂᐊᖅ 1 ᐊᒻᒪ ᑎᕆᒐᓂᐊᖅ 2) ᐊᒻᒪ ᐊᑕᐅᓯᖅ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐅᔭᕋᒃᑕᕐᓂᖅ.

ᑎᕆᒐᓂᐊᖅ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐅᔭᕋᒃᑕᕐᓂᖅ ᐊᑦᑎᒃᓯᕆᐊᖅᑕᐅᒃᑲᓐᓂᕐᓂᐅᔭᖅᑐᖅ 700 ᒦᑕᓂᒃ ᓄᓇᐅᑉ ᖄᖓᑕ ᐊᑖᓄᑦ; ᑕᐃᒪᓐᓇᓗᑦ, ᐃᓚᖓ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐅᔭᕋᒃᑕᓕᐊᖅ ᐊᐅᓛᕐᓂᐊᖅᑐᖅ ᑭᒡᓕᒋᔭᐅᔪᖅ ᖁᐊᖑᐃᓐᓇᐅᔭᖅᑑᑉ ᐊᑖᓂᑦ. ᓄᓇᐃᔭᐃᓂᖅ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐃᒻᒥᖅᑐᕐᓂᐊᖅᑐᖅ ᑯᕕᔪᒥᒃ ᐃᒪᕐᒥᒃ ᐊᐅᓛᖅᑎᑦᑎᓂᐅᑎᓪᓗᒍ, ᐃᒪᖅ ᑯᕕᑕᐅᓗᓂ ᐅᔭᕋᕐᒧᑦ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐅᔭᕋᒃᑕᓕᐊᕐᒥᑦ ᐱᓕᕆᕝᕕᐅᔪᒥᑦ ᖁᐊᖑᐃᓐᓇᐅᔭᖅᑑᑉ ᐊᑖᓄᑦ ᐅᔭᕋᒃᑕᓕᐊᖅ ᓯᕗᓪᓗᒃᓯᒪᓕᖅᑎᓪᓗᒍ.

ᑕᕆᐅᓕᒃ ᐃᒪᖅ ᑎᕆᒐᓂᐊᕐᒥᑦ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐅᔭᕋᒃᑕᓕᐊᕐᒥᑦ ᑲᑎᑕᐅᓂᐊᖅᑐᖅ ᓄᓇᐅᑉ ᐃᓗᐊᓃᑦᑐᓂᑦ ᐃᒪᐃᔭᐃᔾᔪᑎᓄᑦ, ᐊᔅᔭᖅᑕᐅᓗᓂ ᐃᒪᓕᕆᔾᔪᑎᒧᑦ, ᐊᒻᒪ ᐊᑐᖅᑕᐅᒃᑲᓐᓂᖅᑐᓕᐊᖑᓗᓂ ᐊᔾᔨᒌᖕᒋᑦᑐᓂᑦ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐊᐅᓛᖅᑎᑦᑎᓂᕐᒧᑦ ᐊᑐᕐᓂᐊᕐᓗᒍ ᓲᕐᓗ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐃᑰᑕᐃᓂᕐᓄᑦ. ᐊᒥᐊᒃᑰᔪᖅ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᑕᕆᐅᓕᒃ ᐊᒃᑐᖅᑕᐅᓯᒪᔪᖅ ᐃᒪᖅ ᑯᕕᑕᐅᓗᓂ ᓄᓇᐅᑉ ᖄᖓᓄᑦ ᐱᓕᕆᐊᖑᓂᐊᕐᓗᓂ ᐊᒻᒪ ᑎᕆᒐᓂᐊᖅ ᓄᓇᒥᑦ ᐃᓗᑦᑐᖅᓯᒪᔪᖅ 2-ᒧᐊᖅᑕᐅᓗᓂ ᑕᐃᑲᓃᖏᓐᓇᕐᓗᓂ ᑭᓯᐊᓂ ᑯᕕᑕᐅᔪᓐᓇᖅᓯᒃᐸᑦ ᐃᑎᕙᓄᑦ ᓈᒻᒪᒋᔭᐅᓯᒪᔪᖅ ᐃᒪᕐᒧᑦ ᓱᑉᓗᓕᒃᑯᑦ, ᓂᕆᐅᒋᔭᐅᔪᖅ 2025-ᒥᑦ.

EXECUTIVE SUMMARY

This document presents an updated version of the Groundwater Management Plan for the collection, treatment, storage, and discharge of saline groundwater in accordance with the Nunavut Water Board (NWB) Amended Water Licence No. 2AM-MEL1631.

Agnico Eagle Mines Limited (Agnico Eagle) operates the Meliadine Gold Mine (Mine), located approximately 25 kilometres (km) north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut. The Mine Plan proposes open pit and underground mining methods for the development of the Tiriganiaq gold deposit, with two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) and one Underground Mine.

Tiriganiaq Underground Mine is planned to extend to approximately 700 m below the ground surface; therefore, part of the Underground Mine will operate below the base of the continuous permafrost. The underground excavations will act as a sink for groundwater flow during operation, with water induced to flow through the bedrock to the Underground Mine workings once the Mine has advanced below the base of the permafrost.

Saline water from the Tiriganiaq underground mine will be collected in underground sumps, transported to a clarification system, and subsequently recirculated for use in various underground operations such as make-up water for underground drilling. The remaining underground saline contact water will be pumped to surface to be managed and stored in Tiriganiaq Pit 2 until it can be discharged to Itivia Harbour via the approved Waterline, expected in 2025.

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AGNICO EAGLE

LIST OF TABLES

DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
1	February 2018	All		In compliance with Agnico Eagle's Type A Water Licence 2AM-MEL1631, Part E, Item 14	Golder Associates Ltd. on behalf of Agnico Eagle Mines Limited
2	June 2018	4		In compliance with ECCC comments from 16 March 2018	Golder Associates Ltd. on behalf of Agnico Eagle Mines Limited
3.	December 2018	All		In compliance with Agnico Eagle's Type A Water Licence 2AM-MEL1631, Part E, Item 11	Agnico Eagle Mines Ltd.
		Exec Summary		Updated dates and quantities	
		2.4		Revised mine development plan bullets	
		3.3		Updated saline GW quality	
		3.4		Updated groundwater management strategies	
		4.1		Updated GW monitoring program quantity and quality data	
		4.4		Expanded table 5 monitoring to include SWTP	
4.	March 2019	All		In compliance with Agnico Eagle's amended No. 006 Project Certificate, Condition No. 25	Agnico Eagle Mines Ltd.
		Exec Summary		Updated to include discharge to sea approval	
		1	1-2	Update to include requirements of No. 006 Project Certificate Condition No. 25	
		2.4	5	Addition of SWTP and discharge to sea	
		3.1	6-7	Section revision	
		3.1.1	7-8	Addition of inflow model assumptions/uncertainties	
		3.2	8-9	Updated with discharge to sea	
		3.3	9-10	Interpretation added and table Aug-18 results corrected	
		3.4	11-15	Addition of discharge to sea and update of SWTP performance	
		3.6	16-18	Addition of mitigation measures under greater than expected inflows	
		4.2	19	Addition of second pumping line from UG	
		4.3	21-23	Addition of discharge to sea related sampling/monitoring	

Version	Date	Section	Page	Revision	Author
5.	March 2020	All		In compliance with Agnico Eagle's amended No. 006 Project Certificate, Condition No. 25	Agnico Eagle Mines Ltd.
		Exec Summary		General update to reflect updated Plan	
		2.4	15	Update high level mine plan, schedule, addition of SETP and RO	
		3.1	16-17	General section update, and updated groundwater inflow rates included	
		3.2	18-19	Updated saline water control structures	
		3.3	19-20	General section update/revision; moved water quality table to Appendix C	
		3.4	20-24	Section update to reflect changes to saline water management strategy	
		3.5	24	Section revision/update to include SP4, timeline details	
		3.6	-	Former Section 3.6 was updated and moved into other sections	
		4.1	25-27	General section revision/update, QAQC portion moved to Water Quality and Flow Monitoring Plan and can be found in QAQC plan	
6.	January 2021	All		In compliance with Commitment #5 from Technical Meeting held on November 30, 2020 for Amendment Application to the Water Licence No: 2AM-MEL1631	Agnico Eagle Mines Ltd.
		Exec Summary		General update to reflect updated Plan	
		3.1	17-21	Updated with further details, and relocated data reporting to the 2020	
		3.2	21-22	Annual Report Section update focussed on saline water control structures and pond storage	
		3.3	23-31	capacities Section update to reflect current saline water management strategy and to include grouting strategy and effectiveness, and viability discussion management strategies. Addresses Commitment 5 and 6 from the	
		3.5	32	Type A Water Licence Amendment Section revision/update to reflect current	
		4.1	34	schedule	
		Appx B	-	Removed SWTP water quality monitoring Simplified Underground Water	
		Appx C	-	Management Flow Sheet Diagram	

Version	Date	Section	Page	Revision	Author
		Appx C	-	Removed groundwater quality data reporting appendix. This information will be provided in the 2020 Annual Report. Added Grouting and Groundwater Storage information as per 2AM-MEL1631 Technical Meeting Commitment 6	
7	August 2021	All		Updated as per Part B, Item 13 of the Amended Water Licence	Agnico Eagle Mines Ltd.
		2.4	16	Updated Mine Development Plan	
		3.2	20	Updated section to reflect P-Area decommissioning	
		3.3	20	Moved viability discussion on the management strategies to subsection 3.3.4, included Tiriganiaq Pit 2 as current storage	
		3.3.2.4	23	Updated section to include the definition of significant variations in inflow rates which would indicate the need to recalibrate the model	
		4.1.2	29	Updated section and Table 6 to include flowmeter driven inflow calculation, underground to surface pipe sampling point, Tiriganiaq Pit 2	
		Appendix C	-	Removed Appendix C (Grouting effectiveness)	
8_NIRB	February 2022	All		Submitted to NIRB as part of the Meliadine Extension Final Environmental Impact Statement	Agnico Eagle Mines Limited
8_NWB	December 2022	All		Submitted to NWB as part of the Meliadine Extension Water Licence Amendment	Agnico Eagle Mines Limited
9	March 2023	3.1		Text edits on the Predicted Groundwater Volumes section	Agnico Eagle Mines Limited
		3.2		Update of current levels in Table 2	
		3.3.2.2		Text edits on section Saline Effluent Treatment, Storage and Haulage	
		3.3.2.4		Text edits on the section Medium-Term Mitigation Measures – Groundwater Monitoring and Grouting	
		3.3.3		Rephrasing	
		3.3.4		Text edits and number updates to Table 3	
		3.5		Updates to Table 4 Discharge Schedule	
10_NWB	January 2024	All		Submitted with the Meliadine Mine Water Licence Amendment (As of March 2024, the Water Licence Amendment was undergoing the application review.)	Agnico Eagle Mines Limited

Version	Date	Section	Page	Revision	Author
11	March 2024	All		General clarity, wording, and formatting.	Agnico Eagle Mines Limited
		2. (old)		Removed background section and added referral to Water Management Plan.	
		2		Added definitions of three water sources.	
		2.1		Added January 2024 groundwater model updated results.	
		2.1.1		Added reference for linearly reduced conductivity at depth statement.	
		2.2		Revised wording describing saline ponds.	
		2.3.1, 2.3.2, 2.3.3		Removed mitigation measures from each section (added to standalone section 2.3.4).	
		2.3.4		Combined mitigation measures.	
		3.3		Added thermal monitoring discussion. Added borehole instrumentation monitoring.	
		Figures		Removed outdated P&ID. Added simplified schematic of dewatering system.	

ACRONYMS

Agnico Eagle	Agnico Eagle Mines Limited
CP	Collection Pond
DDH	Diamond Drillhole(s)
EMPP	Environment Management and Protection Plan
EPZ	Enhanced Permeability Zone
EWTP	Effluent Water Treatment Plant
FEIS	Final Environmental Impact Statement
Licence	Type A Water Licence 2AM-MEL1631
GWMP	Groundwater Management Plan
MDMER	Metal and Diamond Mining Effluent Regulations
NIRB	Nunavut Impact Review Board
NPC	Nunavut Planning Commission
NWB	Nunavut Water Board
Mine	Meliadine Gold Mine
QA	Quality Assurance
QC	Quality Control
RO	Reverse Osmosis
SD	Support Document
SETP	Saline Effluent Treatment Plant
SP	Saline Pond
SSWQO	Site Specific Water Quality Objectives
SWTP	Saltwater Treatment Plant
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
WMP	Water Management Plan
WRSF	Waste Rock Storage Facility

UNITS

%	percent
°C	degrees Celsius
°C/m	degrees Celsius per metre
ha	hectare(s)
mg/L	milligram(s) per litre
km	kilometer(s)
km^2	kilo square meter(s)
m	metre(s)
m/day	metre(s) per day
mm	millimetre(s)
m^3	cubic metre(s)
m^3/day	cubic metre(s) per day
m^3/s	cubic metre(s) per second
m^3/hour	cubic metre(s) per hour
m^3/year	cubic metre(s) per year
Mm^3/year	million cubic metre(s) per year
Mm^3	million cubic metre(s)
t	tonne(s)
tpd	tonne(s) per day
Mt	million tonne(s)

SECTION 1. INTRODUCTION

Agnico Eagle Mines Limited (Agnico Eagle) operates the Meliadine Gold Mine (Mine), located approximately 25 kilometres (km) north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut. The Mine is subject to the terms and conditions of the amended Project Certificate (No. 006) issued on March 2nd, 2022 by the Nunavut Impact Review Board (NIRB) in accordance with the Nunavut Agreement Article 12.5.12 and Nunavut Water Board (NWB) Type A Amended Water Licence (No. 2AM-MEL1631, 2016) issued by the NWB on May 13, 2021 and approved by the Minister of Northern Affairs on June 23rd, 2021.

Tiriganiaq Underground Mine is currently planned to extend to approximately 700 m below the ground surface; therefore, part of the Underground Mine will operate below the base of the continuous permafrost. The underground excavations will act as a sink for groundwater flow during operation, with water induced to flow through the bedrock to the Underground Mine workings once the Mine has advanced below the base of the permafrost.

Saline water from the Tiriganiaq underground mine will be collected in underground sumps, transported to a clarification system, and subsequently recirculated for use in various underground operations such as make-up water for underground drilling (Figure 1). The remaining underground saline contact water will be pumped to surface to be managed and stored in TIR02 until the approved Waterline is commissioned (expected 2025). Saline contact water will then be treated by the Saline Effluent Treatment Plant in the Water Treatment Complex (SETP-WTC) prior to discharge to Itivia Harbour via the Waterline.

1.1 Objectives

The objective of the GWMP is to provide consolidated information on groundwater management for the Meliadine Gold Mine. The GWMP is divided into the following components:

- Introductory section (Section 1);
- Description of groundwater inflow forecasts and management strategies (Section 2); and
- Description of the groundwater monitoring program (Section 3).

The GWMP will be updated as required to reflect any changes in operations or economic feasibility that occurs, and to incorporate new information and latest technology, where appropriate.

1.2 Background

The Meliadine site conditions, local hydrology and hydrogeology, as well as the mine development plan are presented in the Water Management Plan.

SECTION 2. GROUNDWATER MANAGEMENT

There are three major sources of water at the Mine requiring management under the Mine water management system: freshwater pumped from Meliadine Lake, natural runoff from precipitation, and natural groundwater inflow to the Underground Mine. For the purpose of clarity and consistency, terminology and definitions are applied to these three main sources as follows below.

- **Freshwater:** Water contained within natural water bodies (e.g., Meliadine Lake) which has not come into contact with mine infrastructure.
- **Surface Contact Water:** Rain and snowmelt that has come into contact with mine infrastructure.
- **Saline Contact Water:** Naturally occurring saline groundwater which has flowed into the underground mine and come into contact with underground mine infrastructure.

2.1 Predicted Groundwater Volumes

Planning and mitigations for management of groundwater relies upon predictions of groundwater that may report to the underground workings and then require further storage and management on surface. This section provides a summary of modelling work that has been completed to predict groundwater volumes.

In 2020, an environmental and socio-economic assessment was completed for a proposed increase of the discharge of treated groundwater effluent from the underground mine of the Tiriganiaq deposit into the marine environment near Rankin Inlet, by routing the treated groundwater effluent through waterlines. As a requirement of the Project Certificate No.006 T&C 25, Agnico Eagle provided a saline water management plan to address the potential for higher-than-predicted volumes of saline water inflows into the underground mine. The Groundwater Management Plan (Version 5) was issued on April 2020 using the 2019 groundwater inflow predictions and submitted under the 2020 FEIS Addendum for the "Saline Effluent Discharge to Marine Environment" project. The addendum was approved on January 31, 2022. Versions 6 and 7 of the Groundwater Management Plan were then submitted in compliance with Commitment #5 from the Technical Meeting held on November 30, 2020 for the Amendment Application to the Water Licence No: 2AM-MEL1631, and as per Part B, Item 13 of the Amended Water Licence, respectively. Nonetheless, the 2019 groundwater predicted inflows were still presented in these two versions.

Since 2019, additional data has been collected in support of the environmental review to document existing conditions and to provide the foundation for a qualitative and quantitative assessment of the operations and mine development. This additional data, documented in the Updated Summary of Hydrogeology Existing Conditions Report (WSP, 2024b), was used to update the numerical groundwater model.

Supplemental hydrogeological data was collected to enhance the understanding of hydrogeological conditions. This additional data is documented in the Updated Summary of Hydrogeology Existing Conditions Reports (WSP 2024b).

The numerical groundwater model was updated in January 2024 to include inflow results under an updated mine plan scenario and included a limited calibration based on groundwater inflow monitoring over previous years (WSP, 2024d).

A summary of the predicted groundwater inflow to the Tiriganiaq underground developments during operations for the base case, along with predicted TDS is presented in Table 1. Groundwater inflow to the Tiriganiaq Underground are predicted to increase from 450 m^3/day in 2024 to a peak inflow of 475 m^3/day between 2026 and 2031, with the exception of 2028.

The predictions presented in Table 1 represent the best estimate of groundwater inflow and groundwater TDS based on the measured data and the results of the limited model calibration. Since the groundwater inflows are being mitigated by active grouting, the predicted groundwater inflows incorporate the effects of grouting as grouting of the underground development is assumed to continue as part of future inflow predictions.

Table 1: Predicted Groundwater Inflow and TDS to the Underground Mine (2017 to 2033)

Year	Predicted Groundwater Inflow (m^3/day)	Predicted TDS (mg/L)
2023	300	57,500
2024	450	57,000
2025	450	57,000
2026	475	56,500
2027	475	56,500
2028	450	56,500
2029	475	54,000
2030	475	53,500
2031	475	53,500
2032	450	53,500
2033	450	53,500

2.1.1 Groundwater Inflow Predictions – Assumptions and Uncertainties

The shallow bedrock at the site is primarily within the frozen permafrost except in areas of taliks underlying lakes. The deeper competent bedrock has been subdivided into two separate units: Mafic Volcanic Rock formations and Sedimentary Rock formations. The Mafic Volcanic Rock formations are present between the Lower Fault and Pyke Fault and are inferred to transition to Sedimentary Rock formations to the east. Sedimentary Rock formations are present to the North of the Lower Fault, and

South of Pyke Fault. Synthesis of the hydraulic testing results up to the end of 2021, indicates that the Mafic Volcanic Rocks have lower hydraulic conductivity at depth. The supplemental data, however, show that the shallow and intermediate bedrock zones may be more permeable than the deeper bedrock (WSP 2024c).

In crystalline rocks, fault zones may act as groundwater flow conduits, barriers, or a combination of the two in different regions of the fault depending on the direction of groundwater flow and the fault zone architecture (Gleeson and Novakowski 2009). Within the mine area, three regional faults (North, Lower and Pyke) are present. In addition, ongoing monitoring of geological structures has led to the identification of 17 faults (i.e., KMS corridor, RM-175) that have been incorporated into the conceptual hydostratigraphy near the underground development. Each of these faults have been assumed to have enhanced permeability relative to the surrounding competent bedrock. The additional structures are generally located between the Lower Fault and Pyke Fault within the Mafic Volcanic Rock formations and range in thickness from 2 to 6 m. An exception is the KMS Fault corridor, located in the sedimentary rock formations to the north of the Lower Fault at the Tiriganiaq Underground. This corridor is a wider zone of rock located between the KMS Fault and Lower Fault that is associated with poor rock quality (WSP 2024c).

The hydraulic conductivity of the competent bedrock and faults is assumed to be linearly reduced by an order of magnitude between the top of the cryopeg and base of permafrost (zero-degree isotherm) (WSP 2024c). This assumption reflects that this portion of the permafrost, which will contain partially unfrozen groundwater due to freezing point depression, is expected to have reduced hydraulic conductivity relative to the unfrozen bedrock reflecting the presence of isolated pockets of frozen groundwater within this zone. These frozen zones will result in a decrease in the hydraulic conductivity of the rock compared to that of the entirely unfrozen rock (WSP 2024c).

In support of mine development, 2D thermal modelling was completed to update the predicted depth to the base of permafrost in the study area, to assess the extent of lake taliks and to determine whether continued mine development will remain within the permafrost limits (WSP 2024a). Results of the thermal modelling indicated:

- Open taliks were interpreted to be present beneath portions of each of the following lakes near the proposed open pits and undergrounds: Lake B4, Lake B5, Lake B7, Lake A6, Lake A8, and Lake CH6.
- Closed talik was interpreted below Lake D4 based on the 0-degree isotherm, however the lake is interpreted to potentially be connected to the regional groundwater flow system through the cryopeg zone. The depth of the base of permafrost was interpreted to be between 320 and 490 m depth, with the interpreted depth dependent on the proximity to nearby lakes. Shallower depths are from locations near to lakes both with and without open taliks.

It was conservatively assumed that the surface water/groundwater interaction at all lakes is not impeded by lower-permeability lakebed sediments that may exist on the bottom of some of these lakes (WSP 2024c).

Combined, the assumptions discussed above result in the following sources of uncertainty in the groundwater inflow model:

1. The properties of the faults assumed in the model are considered to be conservative based on supplemental testing in 2021 and their lateral extents and depths. The faults were also assumed to have enhanced permeability up to 2.5 kms away from the underground developments, and the width of the Lower Fault was increased to between 15 to 20 m to account for potential additional low RQD corridors along its length. These assumptions are considered conservative since the permeability and width of a fault zone can be heterogeneous along strike (Gleeson and Novakowski 2009) resulting potentially in zones of greater hydraulic conductivity along strike over short distances; whereas over longer distances the presence of zones infilled with fault gouge will act to decrease hydraulic connectivity along strike (WSP 2024c).
2. An increase in bedrock hydraulic conductivity by a factor of 2 can result in an increase of total saline groundwater inflow by approximately 54%. Overall, groundwater inflow for Tiriganiaq is the largest contributor of saline groundwater inflow to the underground, and uncertainty in these inflows will have the largest effect on water management planning (WSP 2024c).

2.2 Groundwater Management Control Structures

The Tiriganiaq underground workings will be operated below the base of continuous permafrost. The underground excavations act as a sink for groundwater flow during mining, with water induced to flow through the bedrock to the Underground Mine workings below the base of the permafrost and within the cryopeg.

The underground water management system is designed to prevent water from affecting the workings or production. The system contains a series of sumps (generally one at the access of each level) designed to capture groundwater inflows and runoff from mining operations (i.e., drilling), a clarification system, and a pumping system to redistribute the clarified saline contact water.

Saline water from the Tiriganiaq underground mine is collected in underground sumps, transported to a clarification system, and subsequently recirculated for use in various underground operations such as make-up water for underground drilling. The remaining underground saline contact water is pumped to surface to be managed and stored in TIR02 open pit until it can be discharge to sea via the approved Waterline following treatment by the SETP-WTC.

Other groundwater management infrastructure includes Saline Pond 1 (SP1) and Saline Pond 3 (SP3). SP1 was constructed in 2016 and was designed to manage excess saline water from the underground. However, due to its small volume in relation to Tiriganiaq Pit 2 (TIRI02), it no longer operates as a strict saline water storage pond. SP1 is instead used as a buffer pond for the feedwater of the Reverse Osmosis Plant (RO). More details regarding the RO can be found in the Water Management Plan. SP3 was constructed in 2019 and was designed to collect treated saline water from the Saline Effluent Treatment Plant (SETP) (a separate treatment facility from the SETP-WTC) prior to transfer via tanker trucks to the saline effluent discharge system at Itivia Harbour. This method of treatment and discharge is described in section 2.3.2.

A schematic of the underground dewatering system is provided in Appendix A. Pond capacities for storage of saline water and year of available storage are presented in Table 2.

Table 2: Saline Pond Storage Capacity at the Mine

SP/Sump	Maximum Water Capacity (m^3)	Occupied Capacity (Oct 2023) (m^3)
TIR02	1,616,554	613,378
SP1	32,686	4,151
SP3	7,985	0

2.3 Groundwater Management Strategies and Mitigations

Based on the modelled groundwater inflow volume, the following strategies and mitigation options were considered and form part of the short-, medium- and long-term management of groundwater inflows to the Underground Mine:

- Short-term Strategy: Store saline contact water on site (Section 2.3.1)
- Medium-term Strategy: Treat saline groundwater for discharge to receiving environment in Melvin Bay via trucking (Section 2.3.2)
- Long-term Strategy: Treat saline groundwater for discharge to receiving environment in Melvin Bay via waterline (Section 2.3.3).

2.3.1 Short-Term Management Strategy

On-Site Groundwater Storage

This alternative was considered as part of the Type A Water Licence Application (2015) and has been implemented on site as part of the short-term management of groundwater inflows. It involves storing all excess groundwater in temporarily inactive underground developments and in dedicated surface saline water ponds at the Mine. TIRI02 is currently in use for storage of saline contact water on Site (Table 2) and will continue to be used for storage until it can be dewatered to Itivia Harbour following commissioning of the Waterline.

2.3.2 Medium-Term Management Strategy

Saline Effluent Treatment, Storage and Haulage

In August 2019, Agnico Eagle began discharge of treated effluent from the Saline Effluent Treatment Plant (SETP) to sea at Melvin Bay as per the NIRB Project Certificate 006 Amendment 001, issued in February 2019. In September 2020, the daily rate of discharge to Melvin Bay was elevated from 800 m^3/day to 1600 m^3/day.

Saline contact water in the underground mine is first treated for total suspended solids (TSS) underground through a Mudwizard system including decanting basins. Saline contact water from underground is then pumped to surface and stored in the surface saline ponds. From there, the saline contact water as well as other contact water is pumped to the SETP (a separate treatment facility from the SETP-WTC) for ammonia and TSS treatment. The SETP is designed to treat 1,600 m^3/day of saline water for TSS and ammonia. More details are available in Agnico Eagle (2020a). Following treatment, saline water is pumped to SP3 for storage prior to discharge.

Treated saline water stored in SP3 is hauled by tanker trucks to Itivia. Truck loads are up to 36 m^3 per truck and are unloaded using a flexible 4" HDPE suction pipe. The truck discharge pump transfers the treated effluent into the 6'' discharge HDPE pipeline and through the diffuser.

Hauling operations were suspended in 2022 following approval of the waterline (section 2.3.3) under the Amendment 002 of the NIRB Project Certificate No. 006 issued on March 2nd, 2022 and sufficient saline storage capacity on site forecasted until 2026. The cessation of hauling operations also aims to minimize traffic, reduce dust emissions alongside the AWAR and mitigate trucking impacts to community.

Water treated by the SETP and discharged to the environment through either the waterline or punctual hauling operations, if required, will meet MDMER end-of-pipe discharge criteria and be non-acutely and non-chronically toxic as per regulated toxicity testing per the MDMER.

Pumping and Diffusion Plan

The discharge facility includes a 778 m pipeline extending to an engineered diffuser located 20 m below surface in Melvin Bay to ensure proper mixing and prevent interference with traditional activities. The saline effluent will be discharged in a controlled manner through the diffuser to allow for maximum diffusion and minimum environmental impact to the marine environment. Environmental monitoring is discussed in the Ocean Discharge Monitoring Plan.

2.3.3 Long-Term Management Strategy

Treated Groundwater Discharge to Melvin Bay at Itivia Harbour via a Waterline

Based on the current inventory of saline water storage capacity on site (Table 2), and forecasted groundwater inflows (Section 2.1), the proposed long-term strategy of discharging to Melvin Bay via a waterline will allow a more robust and flexible groundwater management system.

Specifically, the objective of the long-term strategy is to remove the need for permanent storage of water on site as a management strategy by providing discharge capacity to drain the saline ponds each year. Storage under the long-term strategy would only be required on a temporary basis to store winter accumulation of groundwater inflows to the Underground Mine. Application for the long-term strategy was submitted to the appropriate authorities in 2020 and approved under Project Certificate (No. 006) Amendment 002 issued on March 2nd, 2022 by the NIRB.

The discharge through the waterlines will follow the Adaptive Management Plan.

2.3.4 Groundwater Management Mitigations

Storage Increase

Upon the occurrence of greater than expected groundwater inflows to the underground mine, or delay in the implementation of the long-term management strategy (waterline discharge; Section 2.3.3), Agnico Eagle will consider expanding saline pond storage capacity until inflows can be reduced or treatment/discharge can manage inflows. Specifically, the mine plan as it relates to open pits can be adapted to provide additional storage.

Storage thresholds to trigger this adaptive management strategy have been set to allow ample time to make adjustments to the mine plan and to proceed through any applicable regulatory processes, if required. The following triggers are in place regarding increasing on-site storage as adaptive management:

- Occupied saline contact water storage capacity on site reaches 80% of total available saline contact water storage capacity; or
- Available saline contact water storage volume on site is expected to reach capacity within two (2) years.

When applying the collective short-, medium-, and long-term strategies together, it is not expected that either threshold will be reached.

Hydraulic Monitoring

As a strategy to support groundwater inflow modelling and monitor groundwater responses to mining, vibrating wire piezometers are currently installed in the rock mass surrounding the Underground Mine. These piezometers are currently and will continue to be applied to assess response of the groundwater pressure (pressure head) to groundwater inflows, and as calibration data for the groundwater inflow model (Section 2.1). The predictive capability of a groundwater inflow model enables additional mitigations measures to be implemented if predictions result in groundwater quantity or quality risks. The groundwater inflow model is also a key input to the global water balance model, which is used to guide infrastructure design for future project developments. An integrated approach using hydraulic monitoring information is also taken when assessing changes to the mine plan to ensure adequate storage capacity is available for groundwater inflows to the mine. This ensures groundwater within the system can be appropriately managed prior to treatment and discharge to sea.

Groundwater Quantity and Quality Monitoring

The groundwater monitoring program allows ongoing comparison of modelled water quantity/quality to realized trends. Details pertaining to the groundwater monitoring program are found in Section 3.

Non-contact groundwater samples as part of the groundwater monitoring program are used as tracers to identify trends and improve predictions regarding groundwater inflow chemistry. If non-contact groundwater samples collected indicate that TDS concentrations are more than 20% higher than the estimated 55,000 mg/L (Section 2.4), then water quality predictions for underground will be reviewed and updated, if required.

Similarly, observed groundwater inflow rates are compared to model predictions (Table 1) on a quarterly basis. If significant variations from model predictions are observed, revision of the assumptions/inputs behind the model will be considered and the model updated, if required.

Based on monthly averages over a window of six consecutive months, if observed variations between actual groundwater inflows and predicted values are 30% or higher, a recalibration of the model or an update of the inflow analysis will be performed. In addition, updates to the groundwater model may be required based on operational changes as the Underground Mine advances.

Fractured Bedrock Grouting

A refined grouting approach began in 2019 based on the premise of preventative grouting (cementing) having greater effectiveness over reactionary grouting, which in previous years would be triggered by intersecting water bearing fractures when carrying out drilling (production and exploratory) and blasting activities.

In developing underground workings, exploratory DDHs in areas of planned development are cemented prior to the advancement of the development. Furthermore, “Jumbo” holes (holes drilled by a Jumbo Drill) are drilled ahead of development and cemented specifically for the purpose of pre-development grouting. Combined, these grouting efforts act to reduce the potential for intersecting inflows with the increased surface area of the excavated heading. Where possible, residual inflows are then plugged on an as-needed basis in these areas. Inflows in blasted stopes and diffuse seeps are generally not able to be grouted and thus remain as active inflows to the underground workings.

The potential for intersecting water-bearing fractures is increased in production long holes (stopes), due to the increased surface area of the excavation and the proximity of the excavation to known water bearing structures. As such, during the drilling phase of stope production, a “grout curtain” is set in and around the stope to minimize the potential for inflows after blasting.

2.4 Groundwater Quality

The salinity of deep groundwater samples collected to date from the Meliadine Mine area are at the high end of what has been observed at other sites in the Canadian Shield at corresponding depths (Frape and Fritz 1987; Holden et al. 2009; Dominion 2014b). Water quality in deep groundwater samplings suggest the salinity remains consistent with depth following the transition from near surface freshwater. Salinity concentrations in deep groundwater at Meliadine are approximately 1.5 times that of sea water (35 g/L) (WSP 2024b).

Data collected from the underground diamond drill holes at Tiriganiaq are collected from depths between 230 and 475 mbgs, which are inferred to be located above the zero-degree isotherm (base of permafrost) based on thermal modelling, and therefore within the cryopeg. TDS within the cryopeg may be elevated relative to groundwater in unfrozen rock at similar elevations due the preferential freezing of ‘fresher’ water and is similar to the assumed TDS below the regional permafrost (approximately 55 g/L) (WSP 2024b).

SECTION 3. GROUNDWATER MONITORING PROGRAM

3.1 Water Quality and Quantity Monitoring

Water quantity and quality monitoring is an important part of the groundwater management strategy to verify the predicted water quantity and quality trends and conduct adaptive management should differing trends be observed.

The groundwater monitoring plan, summarized in Table 3, will be further defined as the Mine advances and will be conducted in agreement with the WMP for the Meliadine Mine. The locations of the monitoring points in relation to the underground dewatering system can be found in Figure 1.

Table 3: Groundwater Quantity and Quality Monitoring Plan

Monitoring Type	Monitoring Location	Purpose	Frequency
Verification	Underground Seeps	Quantity – Underground water balance approach to calculate groundwater inflow rate	Daily
Verification	Underground to surface pipe	Quality – Monitor quality of saline contact water entering saline storage	Monthly
Verification	SP1, Tiriganiaq Pit 02	Quality – Monitor quality of surface saline storage ponds	Monthly during saline discharge
Verification	Underground seeps/DDHs	Quality – Verify quality of groundwater flowing into underground mine	Quarterly

3.1.1 Water Quantity

Groundwater inflow rates to the Underground Mine are estimated by balancing flowmeter measured volumes of water pumped out of the underground mine with changes in total water storage underground. Additionally, estimations for smaller inflows and outflows such as rock haulage moisture content, backfill paste water bleed, and surface to underground inflows are applied to improve calculated inflow accuracy.

Excess underground saline contact water volumes transferred from the Underground Mine to storage ponds on surface are recorded at a flow meter located after the main pumping station from underground to surface. Furthermore, water volumes in storage ponds are tracked via water elevation surveys applied to volume-elevation curves.

Observed groundwater inflow rates are compared to model predictions (Table 1) on a quarterly basis. If significant variations from model predictions are observed, revision of the assumptions/inputs behind the model will be considered and the model updated, if required. Variations that would be considered significant and would indicate the need to consider recalibrating the model and updating the inflow analysis would correspond to when groundwater inflows to the mine, based on a monthly average of inflow over six consecutive months, is 30% higher than the predicted groundwater inflows.

3.1.2 Water Quality

Underground Contact Water

Underground saline contact water is sampled on a monthly basis at the locations identified in Table 3. All underground saline contact water sampling locations are analyzed for the following parameters: conventional parameters (specific conductivity, TDS, TSS, pH, hardness, alkalinity, total and dissolved organic carbon, turbidity), oil and grease, major ions, total and free cyanide, radium 226, dissolved and total metals (including mercury), nutrients (nitrate and nitrite, ammonia, Kjeldahl nitrogen, total phosphorus, orthophosphate) and volatile organic compounds (i.e., benzene, xylene, ethylbenzene, toluene, F2-F4 petroleum hydrocarbons). An additional sampling location was installed in 2021, located on surface and in-line of the underground to surface pumping line. This sampling location provides final representative water quality of underground saline contact water entering surface saline storage before it interacts with previously existing saline contact water on surface and any precipitation runoff inflows.

Underground saline contact water monitoring is carried out for operational and water management purposes by Agnico Eagle. This monitoring data will not be reported to the Regulators in the Annual Water License Report but can be provided upon request by the Regulators.

Non-contact Groundwater

Non-contact groundwater quality is monitored at mine seeps and/or DDH water intersects to verify the quality of groundwater flowing into the mine prior to contact. Flushing and sampling techniques used to ensure samples are taken without contamination are described in Section 2.2.3 of the Quality Assurance/Quality Control Plan. Samples are collected quarterly at a minimum but actual sampling frequency may be greater depending on rate of progress, frequency of water intersects, and observed trends in groundwater quality with time. DDH intersect water samples are analyzed for the following parameters: conventional parameters (specific conductivity, TDS, TSS, pH, hardness, alkalinity, total and dissolved organic carbon, turbidity), major ions, nutrients (nitrate and nitrite, ammonia, Kjeldahl nitrogen, total phosphorus, orthophosphate), radium 226, dissolved and total metals (including mercury). Non-contact groundwater quality data is provided in the Annual Report.

Non-contact groundwater samples as part of the groundwater monitoring program are used to identify trends and improve predictions regarding groundwater inflow chemistry. If non-contact groundwater samples collected indicate that TDS concentrations are greater or less than 20% than the estimated 55 g/L (Section 2.4), then water quality predictions for underground will be reviewed and updated, if required.

3.2 Hydraulic Monitoring

As a strategy to support groundwater inflow modelling and monitor groundwater responses to mining, vibrating wire piezometers are currently installed in the rock mass surrounding the Underground Mine. These piezometers are currently and will continue to be applied to assess response of the groundwater pressure (pressure head) to groundwater inflows, and as calibration data for the groundwater inflow model (Section 2.1).

3.3 Permafrost Terrain Monitoring

Agnico Eagle considers that existing T&C 12 of Project Certificate No.006 is sufficient to protect, mitigate, and monitor the permafrost terrain. Nonetheless, as the primary source of data for calibration and verification of thermal model results for permafrost characterization are temperature measurement from thermistor strings, the following monitoring activities will continue:

- Thermistors will continue to be installed when possible in exploration boreholes, especially boreholes close to planned underground development or beneath large lakes to confirm permafrost depth and talik characteristics.
- Data from a deep thermistor recently installed in an area farther away from lakes (to provide information about regional permafrost depth in areas not influenced by lakes) will continue to be collected and analyzed to assess thermal stability.
- Data from existing thermistors will continue to be collected and analyzed to assess thermal stability of the permafrost terrain.

Existing monitoring and follow-ups that have been implemented during construction and operation will continue to be carried forward through the life of mine.

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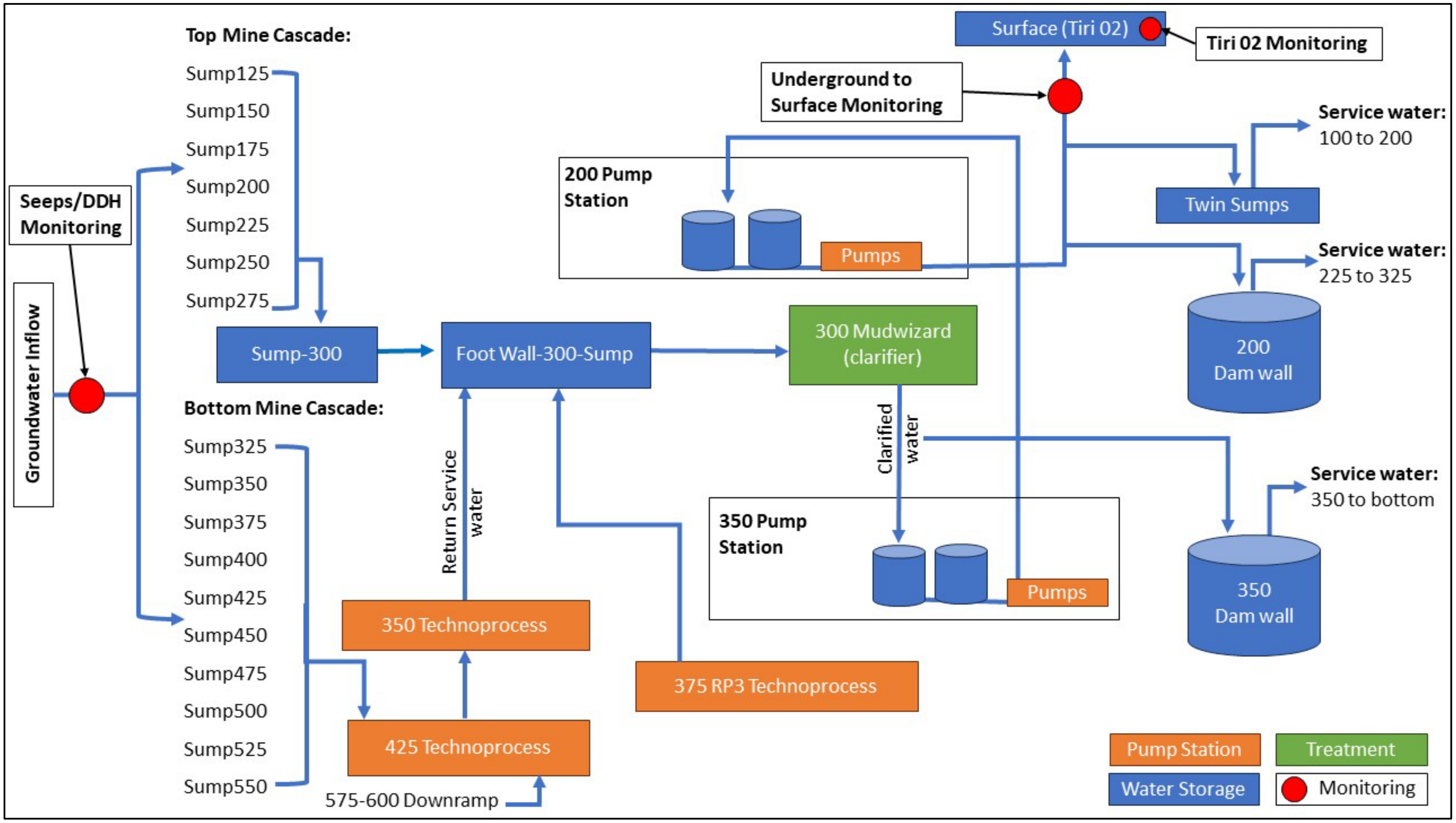
FIGURES

Figure 1: Simplified underground water management flow sheet diagram.



APPENDIX B • FRESHET MANAGEMENT PLAN

MELIADINE GOLD PROJECT

Freshet Management Plan

MARCH 2023

VERSION 8 NWB

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FIGURES AND TABLES

DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
1	March 2016	ALL	-	Comprehensive plan	
2	March 2017	ALL	-		
3	March 2018	ALL	-		
4	December 2018	ALL	-		
5	March 2019	ALL	All	Update to reflect transitional changes to Operations phase	
			2	Include DCP-1 and DCP-5 in areas of risk during Fresh	
			3	Update section 2.1.2/2.1.3 noting 5 evaporators and discuss SP3.	
			5-6	Update Section 2.8, discuss time of pond construction.	
			9-10	Update Section 3.1, discussion of SP3 and update on inspections.	
			13	Update Section 3.6., 3.7, 4 to reflect changes in freshet management.	
			Figure 1	Updated to include structure names	
			Figure 2	Updated to include SP3	
			Appendix A	Update to include emulsion pad to inspection list	
6	March 2020	ALL	All	Document formatting to match common style	
		2	2	Risk areas to include CP6 and TSF	
			Figure 1	Include TSF	
			4	P-Area volumes, source of inflows	
			6-7	Portal sump wording & grammar; include CP6	
			7	Itivia wording & grammar	
		3	10	Update to P-Area management for 2020	

			10	Addition of P-Area emergency pumping strategy
			13	Remove downstream D-CP5 risk mitigation; Add TSF
			13	Addition of temporary water management structure section
		4	15	Update Snow Management information
			Figure 5	Update Site snow management figure
			Figure 6	Update Itivia snow management figure
7	April 2022	ALL	All	General Plan Update
8	March 2023	ALL	ALL	Minor text edits
		2.4	6	Addition of Ore Storage Pad 2 monitoring at Freshet
		4	13-14	Updates of figures 4 and 5.
			Appendix	Removed Appendices

ACRONYMS

Agnico Eagle	Agnico Eagle Mines Limited
AWAR	All Weather Access Road
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
CP	Collection Pond
Freshet	Freshet Action Plan
Itivia	Itivia laydown and fuel handling facility
Licence	Type A Amended Water Licence 2AM-MEL1631
the Mine or Site	Meliadine Mine
NWB	Nunavut Water Board
OP	Ore Storage Pad
P3	P-Area
SP	Saline Pond
Sump LV50	Portal 1 and 2 Sump 1
TSF	Tailings Storage Facility
TSS	Total Suspended Solids
WMP	Water Management Plan
WRSF	Waste Rock Storage Facility

UNITS

m^3	Cubic metre
m	metre
mbg	meters below grade

SECTION 1 • INTRODUCTION

The purpose of the Freshet Action Plan (Plan) is to provide Agnico Eagle Mines Ltd. (Agnico Eagle) with specific management and mitigation measures to address and manage water associated with the freshet season (Freshet), a response plan, and procedures to prevent and to minimize potential negative impacts to the surrounding environment at the Meliadine Mine (the Mine or Site).

The term freshet refers to spring snowmelt, that can also be overlapped by rainfall, which can result in inundation of floodplains. Freshet at Meliadine typically takes place between May 15 and July 30. In some years, Freshet can also happen in early fall, when freezing re-occurs (mid-October) and then thaws. There are areas at the Site that are vulnerable to excess water produced during Freshet; the objective of this document is to identify those areas, and to develop a plan with defined roles and responsibilities to manage excess water produced on site.

The following guiding principles are applicable to the Plan:

- To ensure that mine surface contact water from runoff or seepage is managed to prevent adverse environmental impacts;
- To ensure the health and safety of Agnico Eagle employees and contractors; and
- To ensure the Site is in compliance with the Nunavut Water Board (NWB) Type A Amended Water Licence 2AM-MEL1631 (Licence).

The Plan identifies areas of risk during Freshet, risk management and the procedures necessary to address potential concerns.

SECTION 2 • AREAS OF RISK DURING FRESHET

The key areas of risk during Freshet at the Site include the following:

- Pond P3 (remaining component of the P-Area)
- Portal 1 Sump 1 (Sump LV50)
- Portal 2 Sump 1 (Sump LV50)
- Landfarm A and Landfarm B
- Landfill
- All Weather Access Road (AWAR)
- Infrastructure Areas; including the Exploration Camp area, Portal 1 & 2 and the Industrial Pad Areas
- Collection Pond 1 (CP1), Collection Pond 2 (CP2), Collection Pond 3 (CP3), Collection Pond 4 (CP4), Collection Pond 5 (CP5) and Collection Pond 6 (CP6)
- D-CP1 and D-CP5
- Meliadine Esker Quarry
- Bypass Road
- Itivia laydown and fuel handling facility (Itivia)
- Tailings Storage Facility

Identified areas of risk at Site are shown in Figure 1 and are described in the following section.

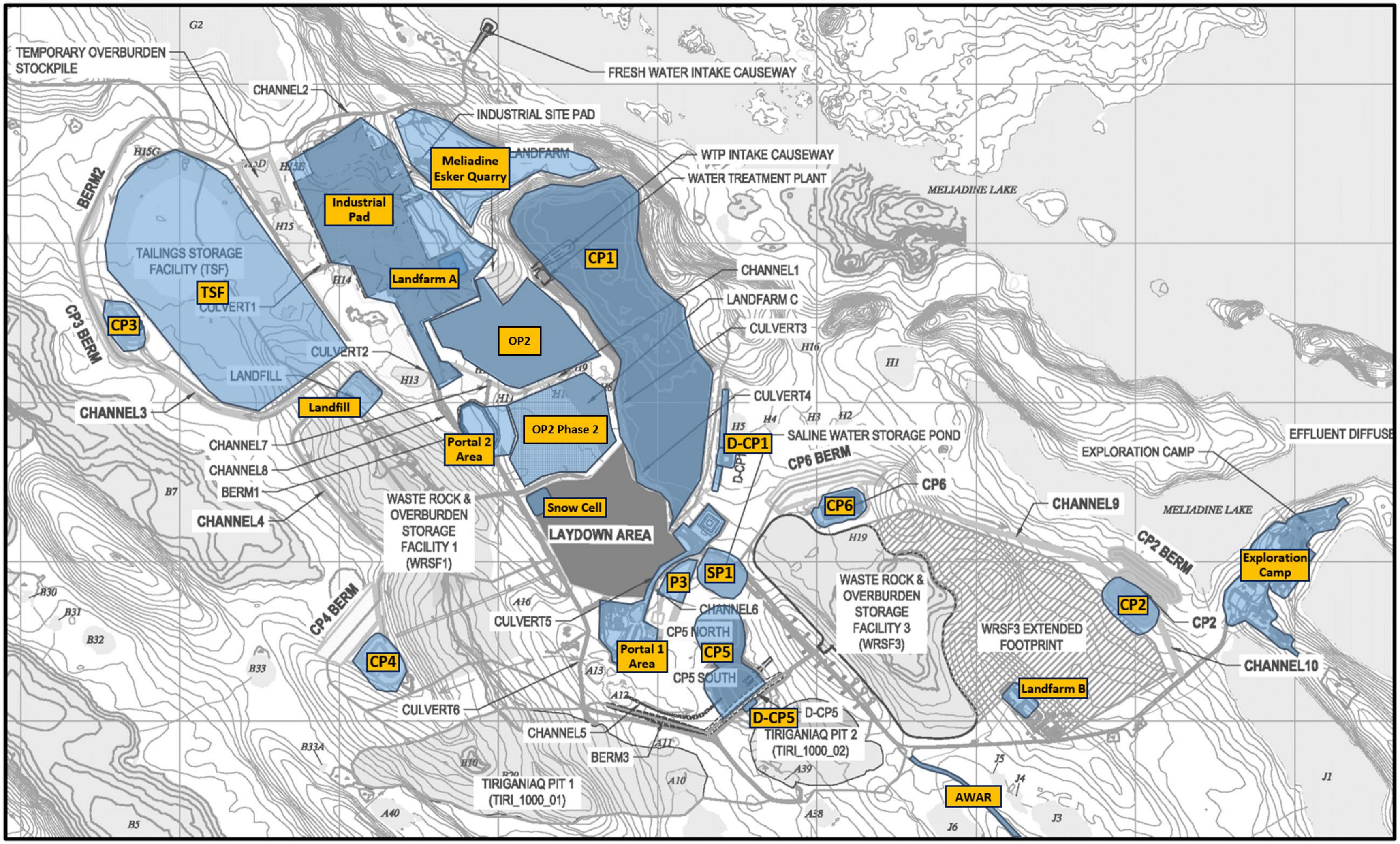

Figure 1: *Site plan view with identified areas of risk at Site during freshet.*

AGNICO EAGLE

2.1 P-Area

The P-Area formerly consisted of three storage ponds as part of the saline contact water management system from 2016-2018. P3 is the remaining cell with a limited capacity of 2,912 m^3. More information on the decommissioning of the P-Area can be found in the most recent version of the Water Management Plan (WMP).

Surface contact water collected in P3 is monitored and managed as per the WMP to ensure the water level remains below the maximum design water elevation (66.22 m) and the protection of the Saline Pond 3 (SP3) liner. Information on SP3 can be found in the WMP.

2.2 Portal 1 Sump 1 (LV50 SUMP)

LV50 is located 50 meters below grade (mbg) and is the first sump located down the Portal 1 ramp. Snowmelt and surface run-off that flows down the portal entrance is directed to sump LV50 where it is then pumped to CP5. The overall capacity for Portal 1 Sump 1 is 29 m^3. Water pumped from Portal 1 Sump 1 to CP5 is measured with a volumetric flow meter and recorded daily.

2.3 Portal 2 Sump 1 (LV50 SUMP)

LV50 is located 50 meters below grade (mbg) and is the first sump located down the Portal 2 ramp. Snowmelt and surface run-off that flows to the portal entrance to sump LV50 is pumped from LV50 towards Channel 1. The overall capacity for Portal 2 Sump 1 is 55 m^3. Water pumped from Portal 2 Sump 1 to Channel 1 is measured with a volumetric flow meter and recorded daily.

2.4 Ore Pad 2

Ore Storage Pad 2 (OP2) and OP2 Stage 2 are located on either side of Channel 1 and are designed ore storage facilities. Freshet monitoring of OP2 and OP2 Stage 2 will include occurrences of seepage, and any observed seepages will be monitored for water quality.

2.5 Landfarm

The Type A Licence Landfarm is located adjacent and north of the OP2 and is designed to receive soils, rock, snow, and ice contaminated with petroleum hydrocarbons, as per the Landfarm Management Plan. This includes light hydrocarbons such as diesel and gasoline. It was assumed that an annual volume of 500 m^3 of contaminated ice and snow would require management and the Landfarm has been designed to account for this volume. Additional details for Landfarm water management are described in the Landfarm Management Plan.

2.6 Infrastructure Areas

Infrastructure Areas represent buildings, pads and towers installed at the Site and include the Industrial Pad, Exploration Camp, and Emulsion Plant (Figure 1).

2.7 CP1, CP2, CP3, CP4, CP5, and CP6

Engineered water containment dikes constructed in 2017 at lakes A54 and H17 were developed as D-CP5 and D-CP1, respectively. The dikes are designed to contain surface contact water within the footprint of the Site. Both CP1 and CP5 are used for Site surface contact water and snow and ice collection prior to Freshet. CP1 and CP5 are illustrated in Figure 1 and discussed in Section 3 of this plan.

CP3 and CP4 are collection ponds designed to collect runoff from the Tailings Storage Facility (TSF) area and Waste Rock Storage Facility 1 (WRSF1) area, respectively. CP3 construction was completed in Q4 of 2018 and CP4 construction was completed in Q2 2019. CP3 and CP4 design plans implement engineered thermal protection berms. Maximum operating levels within CP3 and CP4 are such that Berm-CP3 and Berm-CP4 will not be required to retain water (see Water Management Plan).

CP6 and CP2 are designed to collect runoff from Waste Rock Storage Facility 3 (WRSF3) where the water will then be pumped to CP1 for containment prior to treatment at the EWTP-WTC and discharge to the receiving environment (Meliadine Lake). CP2 and CP6 design implements an engineered thermal protection berm. Maximum operating level within the collection ponds is such that thermal berms will not be required to retain water (further details on these Pond as-built characteristics can be found in the Water Management Plan).

2.8 Tailings Storage Facility

The Tailings Storage Facility (TSF) is a dry stack tailings storage facility. The TSF dry stack is located west of the Industrial Pad as shown in Figure 1. The facility stores compacted tailings that are transported from the process plant by haul truck. The tailings are spread and compacted in the facility. The tailings are deposited within a rockfill berm that is continuously heightened to progressively cover the placed tailings. Culvert 1 is in place to allow passage of water through the TSF haul road and towards CP1 catchment.

2.9 All Weather Access Road (AWAR)

The All-Weather Access Road (AWAR) was built in 2013 to connect the Site to the hamlet of Rankin Inlet. The road is approximately 23.8 km long with twenty-two water crossings; three bridge crossings and nineteen culverts installed (Figure 2).

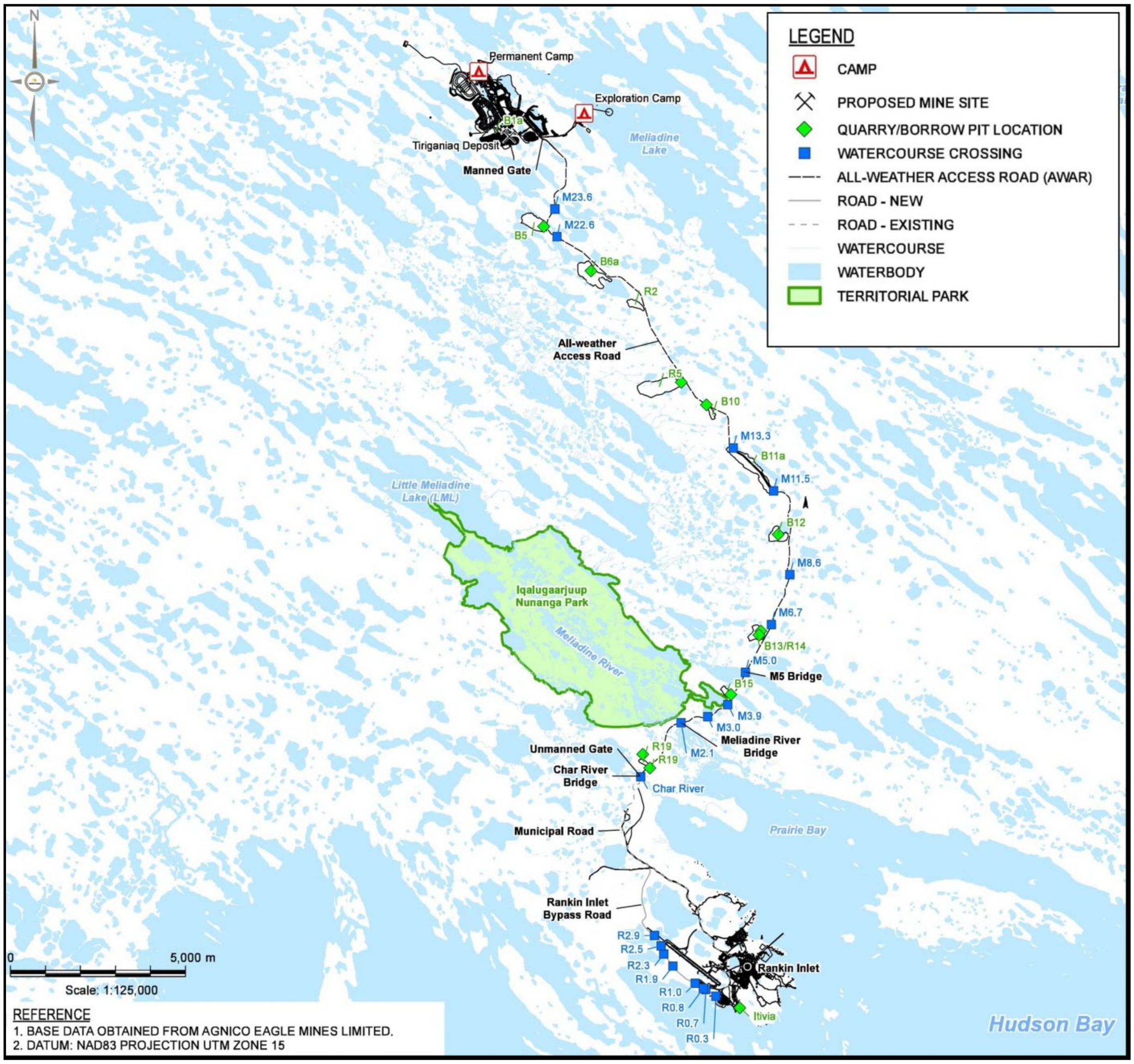

Figure 2: *AWAR Map Showing Water Crossing Location Section*

2.10 Bypass road

The Bypass Road is a 5.9 km access road that provides a means to divert site-related traffic around the community of Rankin Inlet. The Bypass Road spans from the northwest margin of Itivia to km 2.9 on the AWAR (Figure 3) and has 19 culverts installed at 13 locations along the road.

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Figure 3: *Bypass Road and Culvert Location*

2.11 Itivia

Itivia is located in Rankin Inlet and is accessed by the Site from the AWAR and Bypass Road. In combination with the Bypass Road, Itivia is intended to support the Site as a staging point for incoming and outgoing fuel and material handling for barge shipments. Itivia is also the location of the final discharge point for saline effluent generated by the mine. The location of Itivia is shown on Figure 3 and the plan view of the Itivia Site is presented as Figure 5. A culvert is installed to divert upstream runoff around the Itivia Site and to allow passage of runoff from the Itivia laydown area (Figure 5).

SECTION 3 • FRESHET RISK MANAGEMENT

Managing the risks prior to Freshet is a primary objective at Site. Planning and preparing before Freshet alleviates some of the risk from excess water that may suddenly occur and helps to ensure compliance with applicable regulations.

This is managed by removing water (pumping) at collection pond areas prior to winter freeze (fall) to allow sufficient storage capacity from precipitation, snow and ice melt during freshet. For road water crossings, culverts, ditches, and select collection ponds, snow or ice removal after winter freeze and before Freshet (winter and spring) ensure these infrastructure function properly throughout freshet.

Risk management practices for the Site areas during Freshet are described below. Section 4 describes snow management at Site.

3.1 P-Area Risk Management

The following management practices are maintained at the P-Area (P3) during Freshet:

- P3 water levels are monitored daily during freshet. Runoff water collected in P3 will also be monitored for salinity and managed as described in the Water Management Plan.
- Agnico Eagle will conduct weekly freshet structural inspections of berm DP3 and note any observed seepage. Inspections will also include monitoring the base of SP3 for settling, slumping and cracking.
- Weekly water sampling during Freshet.

3.2 Portal 1 Sump 1 Risk Management

Overflow from the Portal 1 LV50 sump will flow down ramp where it will be managed by the underground mine water management system. If the water level against D-CP5 reaches the maximum operating level, any water in the Portal 1 LV50 sump requiring pumping will also be directed down ramp.

3.3 Portal 2 Sump 1 Risk Management

Overflow from the Portal 2 LV50 sump will flow down ramp where it will be managed by the underground mine water management system. In the unlikly situation where flooding conditions would be observed downstream of Culvert 1, water in the Portal 2 LV50 sump requiring pumping will also be directed down ramp.

3.4 Landfarm Risk Management

An oil-water separator is installed at the Landfarm A. The oil-water separator is used to treat both direct precipitation to the landfarm footprint and melt from snow containing hydrocarbons (i.e. snow on which spills occur) that is stored in the landfarm and contaminated snow cell over winter. Treated water is analyzed for benzene, toluene, ethylbenzene and xylene (BTEX), lead, and oil and grease prior to discharge to CP1 or used on the windrows to increase moisture content, as required. Hydrocarbons removed from water are stored and managed as hazmat.

A contaminated snow cell used to store snow containing hydrocarbons (i.e., snow on which spills occur) is located in the northwest corner of the laydown area (Figure 1). Upon snowmelt, water within the contaminated snow cell is transferred to the Landfarm for treatment at the oil-water separator.

If a suitable treatment cannot be completed, the water will be shipped south in totes or bladders for disposal in a certified disposal facility.

3.5 AWAR, Bypass Road and Site access roads Risk Management

The following management practices are maintained to ensure the integrity of the AWAR, Bypass Road and site access roads before and during Freshet:

- Large culverts will be heated/steamed as necessary to allow the free flow of Freshet water.
- Prior to Freshet, water crossings and culverts will have snow removed from ice surface on the upstream and downstream sides of the crossing to allow free flow of water as necessary.
- Visual inspections of AWAR and Bypass Road will be undertaken as to the structural integrity of the abutments and road integrity.
- Weekly (minimum) written inspections throughout Freshet and daily during excessive rainfall response will be completed. The following aspects are monitored during visual inspections: total suspended solids (TSS) transport and signs of erosion, culvert/crossing function, flow intensity, and integrity of roads.

If erosion or ground surface scouring are observed, the E&I Department will be notified for repairs. TSS barriers, silt fences, straw logs or other sediment control methods will be implemented as required. Sediment and erosion monitoring and mitigation will be conducted in accordance with the most recent version of the Sediment and Erosion Management Plan.

3.6 Infrastructure Areas

Risk management practices for the main Infrastructure Areas at the Site during Freshet are described in the following sections.

3.6.1 Camp Pads and Surroundings

Risk management practices are maintained at the Exploration Camp, Main Camp and surrounding camp areas as follows:

- Clearing off ice and debris from culverts prior to and during Freshet;
- Visual inspections to ensure flow through culverts and along channels is not impeded;
- Visual inspections for excessive water pooling. If pooled water is observed to flow into a water body, a water sample will be collected and monitored for TSS. Follow-up samples will be collected on a weekly basis thereafter;
- Visual inspections for snowmelt runoff. If runoff is observed to flow into a water body, a water sample will be collected and monitored for TSS in accordance with the Sediment and Erosion Management Plan. Follow-up samples will be collected on a weekly basis thereafter; and
- TSS transport will also be monitored at the culvert beside the garage at Exploration Camp that flows towards Meliadine Lake. This area will be monitored for TSS, and preventative measures (install straw wattles and/or booms) will be installed to prevent deleterious substances from entering Meliadine Lake. Sediment and erosion monitoring and mitigation will be conducted in accordance with the most recent version of the Sediment and Erosion Management Plan.

3.6.2 Industrial Pad and Access Road

The following management practices are maintained to ensure the integrity of the industrial pad and access road:

- This area will be monitored for turbidity and preventative measures (install straw wattles and/or booms) will be implemented to limit TSS in runoff to CP1.

3.6 CP1, CP2, CP3, CP4, CP5 and CP6

Risk management practices for CP1, CP2, CP3, CP4, CP5 and CP6 include discharging/pumping the water prior to winter freeze to be treated and/or discharged as per the Licence and the Water Management Plan. Inspections of CP1, CP2, CP3, CP4, CP5, CP6, and associated water management structures or thermal protection berms, will be conducted following Part E Item 16 of the Licence and as per the Water Management Plan.

3.7 Itivia

The following management practices are maintained to ensure the integrity of Itivia and the Bypass Road:

- The culvert installed between the Itivia laydown and the existing laydown areas (Figure 5) will be cleared of snow and ice prior to Freshet and the upstream and downstream monitored for TSS transport in accordance with the most recent version of the Sediment and Erosion Management Plan. Preventative measures (installation of straw wattles and/or booms) will be implemented as needed;

- Rip rap was installed around the culvert to control erosion and a decantation sump will be maintained downstream to collect suspended sediment;
- Two rock check dams were installed in 2019 and two additional rock check dams were installed in the fall of 2021 upstream of the culvert to mitigate TSS transport through the Itivia site (Figure 5; Tetra Tech 2019);
- Monitoring at other locations of runoff during Freshet in accordance with the most recent version of the Sediment and Erosion Management Plan.

3.8 Tailings Storage Facility

The following management practices are maintained to ensure the integrity of the Tailings Storage Facility (TSF) and its associated structures:

- Culvert 1 (access road to TSF) will be cleared of snow and ice as applicable prior to Freshet and will be monitored closely for TSS transport;
- Snow that has accumulated on the TSF deposition surface will be removed prior to Freshet to reduce snowmelt runoff and pooling (Section 4);
- Daily visual inspections for ponding and areas of elevated sediment transport during Freshet;
- Weekly inspections carried out to identify areas of concern including issues of seepage, cracking, and ponding on the TSF and associated structures.

3.9 Temporary Water Management Structures

Based on anticipated areas of ponding and/or impediment to flow on Site, or in reaction to unexpected ponding and/or impediment to flow on Site, temporary water management structures may be implemented to protect infrastructure by encouraging water movement through the water management system. Temporary water management structures will be constructed as needed and decommissioned when the event invoking the requirement (i.e., ponding) comes to an end. Such structures will be built in such a way that they maintain the overall flow direction of waters on site and do not affect the discharge to the receiving environment. No temporary measures would be placed outside the project footprint, nor alter the way water enters into the receiving environment. Temporary water management structures may include:

- Trenching in snow and/or ice;
- Excavation into ice to allow the immediate installation of pumps, avoiding the necessity to wait for ice to thaw; or
- Trenching/spillways across roads on Site or on the AWAR at areas of ponding where pumping rates are unable to match accumulation rates.

SECTION 4 • SNOW MANAGEMENT

Proper snow management during the winter is a key component of the freshet action plan since it contributes to risk mitigation from excess water during Freshet and prevents possible environmental impacts. An internal Snow Management Procedure was developed to efficiently manage snow at the Site.

Snow that is removed from the Main Camp, Industrial Pad, Ore Pad, 6 Million Liter Fuel Farm, Portal 2 Pad, and Crusher Pad will be transported to a snow dump located at the north margin of CP1. Snow removed from the Tailing Storage Facility (TSF) will be transported to either the northeast side of the TSF or to the northwest side, just north of CP3. Snow removed from the Paste Plant, Batch Plant, and surrounding laydowns will be transported immediately north of the Batch Plant and maintained as a level snow pad. Snow removed from the 3 Million Liter Fuel Farm, Portal 1 Pad, Vent Raise, SWTP/SETP Pad, and associated laydowns will be transported north of the warehouse laydown pad, west of the main access road to the industrial pad (Lake H8 snow pad) and maintained as a level snow pad. Snow from Tiriganiaq Open Pit 1 will be transported to CP4 watershed and maintained as a snow pad.

Snow removed from roadways must be blown or maintained as a snow pad next to the road. Snow removal outside of the designated zones is maintained as a clean, level snow pad. Figure 4 illustrates the locations for snow collection during the winter and prior to Freshet. Figure 5 illustrates the snow management and storage areas for Itivia.

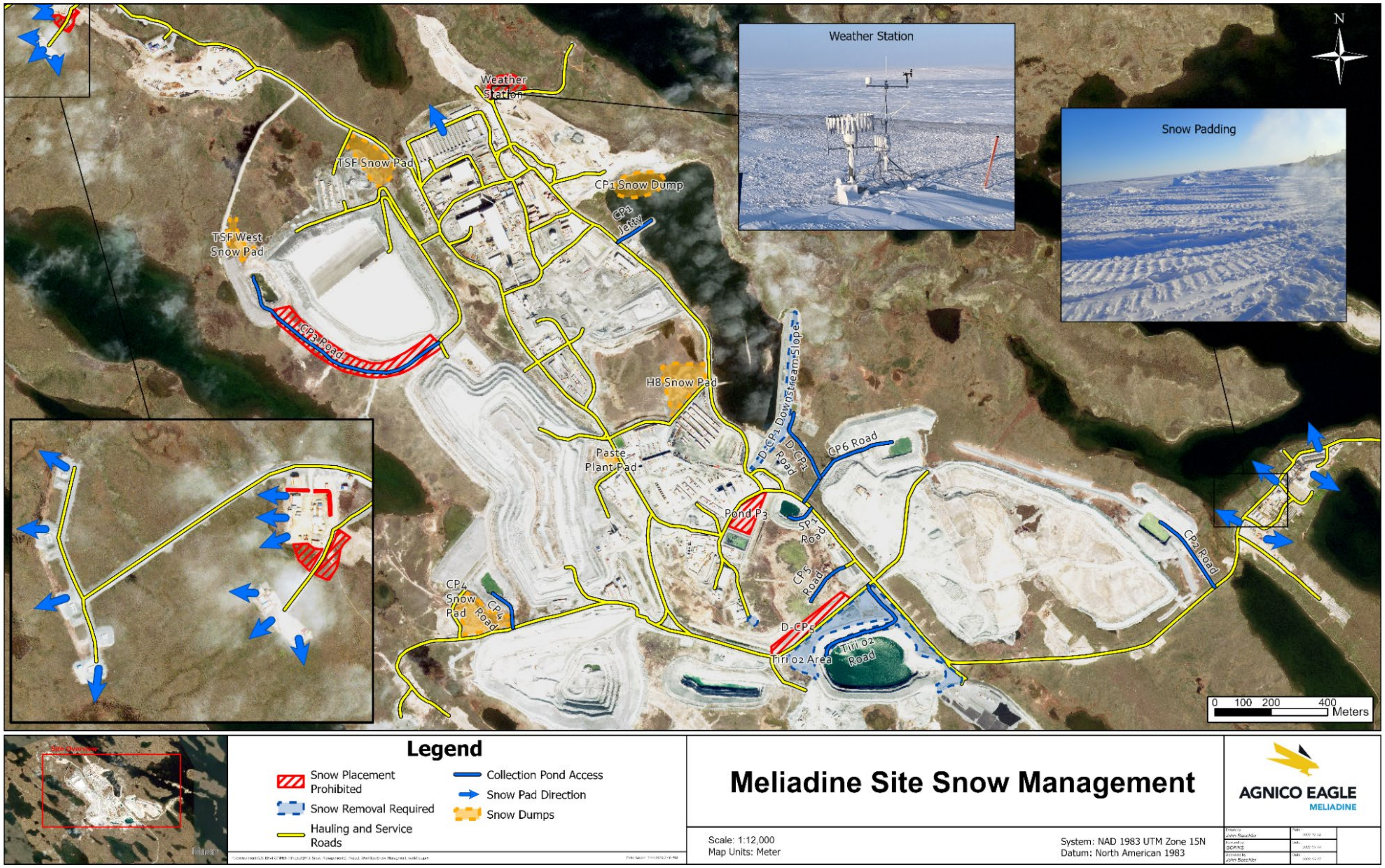

Figure 4: *Snow Management Plan on Site.*

Figure 5: *Itivia Snow Management Areas*

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Agnico Eagle. 2022. Meliadine Gold Project: Landfarm Management Plan. Version 4. April 2022. 6513-MPS-15.

Tetra Tech. 2019. Construction summary (as-built) report for Rankin Inlet Itivia site fuel storage and containment facility Meliadine project, Nunavut. Amendment#01 to 6515-E-132-005-132-REP-015. September 2019.

APPENDIX C • SEDIMENT AND EROSION MANAGEMENT PLAN

AGNICO EAGLE

Meliadine Division

Sediment and Erosion Management Plan

MARCH 2024

VERSION 4

EXECUTIVE SUMMARY

This document presents the Sediment and Erosion management plan (the Plan) at the Meliadine Gold Mine. The purpose of this Plan is to provide consolidated information on the management and monitoring of potential areas subjected to erosion. This is accomplished by reviewing the potential effects of total suspended solids (TSS) and turbidity, the Federal guidelines and the Licence requirements, followed by the periods and types of activities subjected to erosion, and the specific monitoring and mitigating measures.

General findings on the effects of TSS on fish and fish habitat have been listed, such as sublethal and lethal effects on fish and their eggs. Federal TSS Guidelines have been cited, distinguishing the short-term and long-term exposure thresholds. Turbidity guidelines are also discussed in the present document. The Plan presents the monitoring and mitigating actions related to three (3) specific periods of activity: Periods of construction near water – during construction and operation; periods of freshet or significant runoff events – during construction, operation and closure; periods of potential impact to waterbodies – during operation. The proposed monitoring and mitigating measures are discussed for those periods of activity.

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ᖃᐅᔾᔭᐅᔪᑦ ᖃᓄᐃᙵᓕᖅᑎᑦᑎᓂᖏᓐᓄᑦ TSS ᐃᖃᓗᙵᑦ ᐃᓂᖏᓐᓄᓪᓗ ᑎᑎᕋᖅᑕᐅᓚᐅᖅᑐᑦ, ᐅᓗᕆᐊᓇᓗᐊᖏᑦᑐᑦ ᐊᒻᒪᓗ ᐅᓗᕆᐊᓇᖅᑐᑦ ᖃᓄᐃᙵᓕᖅᑎᑦᑏᑦ ᐃᖃᓗᙵᑦ ᐊᒻᒪᓗ ᒪᓂᖏᓐᓄᑦ. ᑲᓇᑕᒥᑦ TSS-ᒧᑦ ᒪᓕᒃᑕᐅᔪᖅᓴᐃᑦ ᐅᖃᓕᒫᖅᑕᐅᓯᒪᔪᑦ, ᓇᓗᓇᐃᖅᓱᒋᑦ ᓇᐃᑦᑐᒥᑦ ᐊᒻᒪᓗ ᐊᑯᓂᐅᔪᒥᑦ ᑕᑯᒃᓴᐅᓂᕐᒧᑦ ᑎᑭᐅᑎᓃᑦ. ᑕᕆᐅᖃᕐᓂᕐᒧᑦ ᒪᓕᒃᑕᐅᔪᖅᓴᐃᑦ ᐅᖃᐅᓯᐅᙱᔪᑦ ᑕᖅᕙᓂ ᑎᑎᖅᑲᒥᑦ. ᐸᕐᓇᐅᑎ ᑐᓂᓯᔪᖅ ᖃᐅᔨᒋᐊᖃᑦᑕᕐᓂᕐᒥᒃ ᐊᒻᒪᓗ ᐊᖏᓗᐊᖏᒋᐊᖅᑎᑦᑎᓂᕐᒨᕐᖓᔪᓂᒃ ᐱᙳᓱᓄᑦ ᖃᓄᐃᓕᐅᕐᓂᐅᔪᓄᑦ: ᓴᓇᕙᓪᓕᐊᓂᕐᒥᑦ ᐃᒪᐅᑉ ᖃᓂᑕᙳᓂᑦ - ᓴᓇᕙᓪᓕᐊᑎᓪᓗᒋᑦ ᐊᒻᒪᓗ ᐊᐅᓖᖅᑎᑦᑎᓂᕐᒥᑦ; ᐊᐅᒃᐸᓪᓕᐊᓂᐅᑎᓪᓗᒍ ᐅᕝᕙᔫᓐᓃᑦ ᑰᖓᓂᖃᓗᐊᕐᓂᐅᔪᓂᑦ - ᓴᓇᕙᓪᓕᐊᑎᓪᓗᒋᑦ, ᐊᐅᓖᖅᑎᑦᑎᓂᕐᒥᑦ ᐊᒻᒪᓗ ᐅᒃᑯᐊᖅᐸᓪᓕᐅᓂᕐᒥᑦ; ᐊᒃᑐᖅᑕᐅᓂᖃᑐᐃᓐᓇᕆᐊᖃᕐᓂᖏᓐᓂᒃ ᐃᒪᖃᕐᓂᐅᔪᑦ - ᐊᐅᓪᓛᖅᑎᑦᑎᓂᖃᖅᑎᓪᓗᒋᑦ. ᖃᐅᔨᒋᐊᖃᑦᑕᕐᓂᐅᔪᖅ ᐊᒻᒪᓗ ᐊᖏᓗᐊᖏᒋᐊᖅᑎᑦᑎᓂᕐᒨᕐᖓᔪᑦ ᐅᖃᐅᓯᐅᔪᑦ ᖃᓄᐃᓕᐅᕐᓂᐅᔪᓂᑦ.

AGNICO EAGLE

DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
1	March 2019	All		Comprehensive Plan	Agnico Eagle
2	March 2020	2.3	5	Updated to include TSS guidelines for MEL-14 Monitoring Program Station	Agnico Eagle
		3.3	7	Updated mitigation measures to include check dams	
3	March 2021	2.2.1	4	Updated Table 2.1	Agnico Eagle
4	March 2024	2.2.2	4	Removed typical turbidity: TSS ration	Agnico Eagle

TABLE OF CONTENTS

Acronyms

Agnico Eagle	Agnico Eagle Mines Limited
CCME	Canadian Council of Ministers of the Environment
DFO	Fisheries and Oceans Canada
Mine	Meliadine Gold Mine
NIRB	Nunavut Impact Review Board
NTU	Nephelometric Turbidity Units
NWB	Nunavut Water Board
Plan	Sediment and Erosion Management Plan
TSS	Total Suspended Solids

UNITS

h	hour
km	kilometre
km^2	square kilometre
mg/L	milligram per litre

SECTION 1 • INTRODUCTION

Agnico Eagle Mines Limited (Agnico Eagle) is developing the Meliadine Gold Mine (Mine), located approximately 25 kilometres (km) north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut. Situated on the western shore of Hudson Bay, the Mine site is located on a peninsula between the east, south, and west basins of Meliadine Lake (63°1’23.8’’ N, 92°13’6.42"W), on Inuit owned lands. The Mine is located within the Meliadine Lake watershed of the Wilson Water Management Area (Nunavut Water Regulations Schedule 4).

The Mine is subject to the terms and conditions of both the amended Project Certificate 006 issued by the Nunavut Impact Review Board (NIRB) on March 2nd, 2022 and the Type A Amended Water Licence No. 2AM-MEL1631 (the Licence) issued by the Nunavut Water Board (NWB) on May 13, 2021 and approved by the Minister of Northern Affairs on June 23rd, 2021.

The Mine Plan includes one underground mine (Tiriganiaq Underground Mine) and two open pits (Tiriganiaq Open Pit 1 and Tiriganiaq Open Pit 2) for the development of the Tiriganiaq gold deposit.

The following phased approach is proposed for the development of the Tiriganiaq gold deposit:

- Phase 1: 3.5 years for Mine Construction (Q4 2015 to Q2 2019);
- Phase 2: 8.5 years for Mine Operations, beginning in 2019 (Q2 2019 to 2027);
- Phase 3: 3 years Mine Closure (2028 to 2030); and;
- Phase 4: Post-Closure (2030 forward).

Key mine development activities and sequence are presented in other relevant documents including the Mine Waste Management Plan and Interim Closure and Reclamation Plan.

This document presents the Sediment and Erosion Management Plan (the Plan). The purpose of this Plan is to provide consolidated information on the management and monitoring of potential areas subjected to erosion. This is accomplished by presenting first a review of the potential effects of total suspended solids (TSS) and turbidity, the Federal guidelines and the Licence requirements, followed by the periods and type of activities subjected to erosion, and the specific monitoring and mitigating measures.

The Plan was developed in accordance with the Licence and the NIRB Project Certificate No.006 (Term and Condition 28)., The Plan was developed to prevent or minimize the effects of destabilization and erosion that may occur due to Mine activities. The plan also details sediment control plans to prevent and/or mitigate sediment loading into surface water within the Mine area.

The objectives of the plan are:

- To prevent the release of sediment into streams and waterbodies during construction activities;
- To reduce and mitigate erosion and the release of sediment during operations activities;
- To specify erosion and sediment control measures that, if implemented and maintained, will help Agnico Eagle maintain compliance with the Federal Fisheries Act, specifically with Section 36(3) of the Act, which prohibits the deposition of deleterious substances into waterbodies frequented by fish; and
- To provide references to approvals, relevant standards, control plans and procedures for training, communications, investigation and corrective action, and audits.

SECTION 2 • TOTAL SUSPENDED SOLIDS/TURBIDITY EFFECTS, FEDERAL GUIDELINES AND LICENCE REQUIREMENTS

2.1 Effects of Total Suspended Sediments on Fish Habitat

Suspended sediments, and associated effects on water clarity, have the potential to affect fish and fish habitat in a variety of ways, including but not limited to:

- Smothering of deposited eggs or siltation of spawning habitats;
- Smothering of benthic invertebrate communities;
- Decreased primary productivity caused by reduced light penetration;
- Reduced visibility, which may decrease feeding efficiency and/or increase predator avoidance; and
- Clogging and abrasion of gills.

Moreover, the general findings for effects of TSS on fish and fish habitat indicate the following:

- Effects of TSS depend on both the concentration of TSS and duration of exposure;
- Effects of TSS can also be influenced by the size and shape of suspended particles;
- Lethal concentration of TSS on fish over acute exposure ranges from hundreds to hundreds of thousands of mg/L;
- Sublethal effects on fish (reduced growth, changes in blood chemistry, histological changes) associated with chronic exposures tend to be exhibited at TSS concentrations ranging from the tens to hundreds of mg/L;
- There is considerable uncertainty about potential effects of low TSS concentrations over long time periods;
- Overall, the most sensitive group of aquatic organisms to TSS appears to be salmonids, and guidelines are developed to protect this group;
- Adult salmonids are generally more sensitive to short durations of high concentrations of suspended sediments than juvenile salmonids; and
- Low suspended sediment levels are known to cause egg mortality (40 %) to rainbow trout at long durations (7 mg/L at 48 days). Guidelines for long-term exposure reflect these findings.

More details can be found in the report from Fisheries and Oceans Canada (DFO) on the effects of sediments on fish and their habitat (Fisheries and Oceans Canada, 1999).

2.2 Federal Guidelines

2.2.1 TSS Guidelines

The Canadian Council of Ministers of the Environment (CCME) specifies separate guidelines for TSS for clear and high flow periods. The guidelines are derived primarily from Caux *et al*. (1997), with application intended mainly for British Columbia streams. In the case of the application to the Meliadine Project lakes, the clear flow guidelines would be most relevant; even during freshet. The lakes would not expect to see large natural fluctuations in TSS except in localized areas for short periods.

The guidelines put forth by the CCME recognize that the severity of effects of suspended sediments is a function of both the concentration of suspended sediments and the duration of exposure. Guidelines are intended to protect the most sensitive taxonomic group and the most sensitive life history stages.

Table 2.1 CCME National Guidelines and MDMER Legislated Standards for TSS

Source	Short-Term Exposure	Long-Term Exposure
CCME (1999, updated 2002)	Anthropogenic activities should not increase suspended sediment concentrations by more than 25 mg/L over background levels during any short-term exposure period (e.g., 24-h).	For longer term exposure (e.g.,inputs lasting between 24h and 30 days), average suspended sediment concentrations should not be increased by more than 5 mg/L over background levels.
MDMER 2002, last amended June 2023	Maximum authorized concentration in a composite effluent sample = 22.5 mg/L. Maximum authorized concentration in a grab sample of effluent = 30 mg/L.	Maximum authorized monthly mean effluent concentration = 15 mg/L.

2.2.2 Turbidity Guidelines

The type and concentration of suspended matter controls the turbidity of water (CCME 1999). As turbidity is affected by factors such as the concentration, size, shape, refractive index of suspended sediments, and water colour, the relationship between turbidity and suspended sediments is site-specific (CCME 1999). Turbidity guidelines used at the Mine take into consideration the types of material generating the suspended sediments. Reference to historic datasets for a particular material type or area may help to estimate a suspended solids concentrations based on turbidity readings. In the case of turbidity for clear water, CCME (1999) recommends a maximum increase of 8 Nephelometric Turbidity Units (NTU) from background levels for a short-term exposure (e.g., 24-hour period), and a maximum average increase of 2 NTU from background levels for a longer term exposure (e.g., 30-day period).

CCME (1999) notes that in some cases short-term resuspension of sediments and nutrients in the water column can augment primary productivity, and in other cases, changes in light penetration may be inconsequential if a system is limited by other factors such as nutrients. The Caux *et al*. (1997) study considered effects of suspended sediment not only on fish but also on algae and zooplankton. In summary, the recommendations put forth by Caux *et al*. (1997) are based mainly on the most sensitive taxonomic group, which is salmonids.

However, research has shown that widespread, chronic turbidity can result in reduced light penetration and subsequent reductions of primary productivity (Fisheries and Oceans Canada, 1999; Canadian Council of Ministers of the Environment, 1999; Lloyd, Koenings, & Laperriere, 1987). Consequently, water clarity is of concern at broader spatial scales and longer time frames. It should be noted that DFO's report on effects of sediment on fish and their habitat (DFO, 1999) endorses the guidelines for TSS put forth by the CCME (1999), but does not recommend following guidelines for turbidity. Rather, turbidity may be used as a surrogate for suspended sediment only when the relationship between the two parameters is established for a particular waterbody.

2.3 Licence Requirements for the Protection of Fish and Fish Habitat at Meliadine

The Nunavut Water Board (NWB) Type A Water Licence for the Meliadine Mine includes:

All surface runoff and/or discharge from drainage management systems, at the Monitoring Program Stations MEL-SR-1 to MEL-SR-TBD referred to in Part I, Item 10, during the Construction/Operation of any facilities and infrastructure associated with the Mine, including laydown areas and All Weather Access Road, where flow may directly or indirectly enter a Water body, shall not exceed the Surface Runoff and Discharge from Drainage Management Systems quality limits in Table 2.3.

Table 2.3 Surface Runoff and Discharge from Drainage Management Systems Quality Limits

Parameter	Maximum Average Concentration	Maximum Concentration of Any Grab Sample
Total Suspended Solids (TSS) (mg/L)	50.0	100.0
Oil and Grease	No Visible Sheen	No Visible Sheen
pH	Between 6.0 and 9.5	Between 6.0 and 9.5

Additionally, the discharge of effluent from the Final Discharge Point at Monitoring Program Station MEL-14 directed to Meliadine Lake through the Meliadine Lake Diffuser shall not exceed the following TSS concentrations, in accordance with the requirements of the Type A Water Licence (Part F, Item 3) and MDMER (see Table 2.1 above):

- Maximum monthly mean effluent concentration: 15 mg/L;
- Maximum concentration of any grab sample of effluent: 30 mg/L.

SECTION 3 • SEDIMENT AND EROSION MONITORING AND MITIGATION

3.1 Sediment and Erosion during Specific Periods

The purpose of the Plan is to ensure that Agnico Eagle will successfully monitor signs of sedimentation and erosion and minimize its resulting effects. This plan presents the monitoring and mitigating actions related to three (3) specific periods of activity for Meliadine:

- Periods of construction near water – during construction and operation;
- Periods of freshet or significant runoff events – during construction, operation and closure;
- Periods of potential impact to waterbodies – during operation.

The construction of infrastructure near water (including water management infrastructures) could potentially lead to excess TSS. Therefore, erosion control methods must be considered during construction activities. In addition, erosion control must be considered during any dewatering activity.

The freshet season at Meliadine occurs approximately from mid-May until the end of June. In addition, there can be periods of high water flow due to rainfall events from late May – early October. As most site construction has been completed at the Meliadine site there are new areas and infrastructure that have become potentially vulnerable to excess water during the freshet season and in response to rainfall, such as, but not limited to:

- Culverts and other water management infrastructures;
- Newly constructed embankments, such as roads and berms;
- Water channels; and
- Surface runoff.

Water transfer and water discharge during operation can also lead to erosion and sedimentation.

3.2. Erosion and Sediment Monitoring

To monitor potential erosion and sedimentation, smaller water management infrastructure such as culverts, cross drains, surface runoff and ditches are inspected up to daily during freshet (minimum of weekly), on a monthly basis thereafter and daily after significant rain events. Larger culverts and bridges are inspected more often if they represent a risk for daily operations, for the receiving environment or for the health and safety of workers. More specifically, the following aspects are monitored during visual inspections:

- Accumulation of debris near the inlet of the crossings, impeding the free flow of water at those locations;
- Bed erosion upstream and downstream of watercourse crossing structures;
- Scour under bridge abutments and abutment foundations; and
- Erosion along cutslopes and fillslopes of embankments (rill and gully erosion), etc.

Newly excavated channels are inspected on a regular basis and after significant rain events. Erosion signs along the channel flow are monitored and documented. Inspections are carried out during the spring when surficial ice moves towards the inlet of the diversion channels to ensure that no ice blockage causes water buildup upstream of the channel, which could lead to subsequent erosion problems. It is important to develop a database to determine if adverse trends are occurring. If adverse trends are observed, then mitigation will be undertaken to prevent a major incident.

The frequency of water and turbidity sampling are in accordance with the requirements of the Type A Water Licence and MDMER. The frequency will be increased if required during the freshet season or during heavy rainfall events. Procedures for turbidity monitoring include:

- Collection of water at the site of sediment entrance (exposure), and at a reference site (i.e., in the same watercourse/waterbody in an area unaffected by the sedimentation [upstream, at least 50 m away where water does not appear to be impacted]).

- Analyze samples for turbidity using a field turbidity meter and compare the exposure sample to the reference sample.

- If the exposure sample results are higher than the reference then mitigation will be undertaken (i.e. installation of silt fencing, silt barrier booms, etc.) to prevent any impact to watercourses.

If Agnico Eagle is actively working in an area with elevated turbidity – the work will stop until the level of clarity returns to an acceptable level.

Monitoring will be documented with site photographs and inspection forms.

3.3 Mitigation Measures

The following mitigation measures could be used, if required, to reduce risks associated with erosion and sedimentation.

- Riprap or clean non-acid generating/non-metal leaching rockfill could be used to armor shorelines, bridge abutments, culverts inlets and outlets and toe berms;
- Ditches managing high volumes of water could be armored for erosion control and reduce the speed of water flow;
- Sedimentation basins could be constructed at sensitive locations to allow settlement of finer sediments;
- Check dams could be constructed in areas of sustained high levels of TSS to mitigate transport of TSS downstream;
- Ditches, culverts and other water crossing structures should be maintained free of debris to allow free flow of runoff water;
- Installation of erosion control material such as turbidity barriers, silt curtains or straw booms;
- Site-specific erosion issues may arise during the mine operation that require specific local corrective actions;
- In-stream construction during periods when streams are expected to be dry or frozen to the bottom (i.e., during winter or fall). Isolation methods will be used for work below the high water mark for streams with flowing water at the time of construction;

- Materials installed below the high water mark (i.e., riprap) will be cleaned prior to installation to avoid adding deleterious substances to watercourses. Where concrete is installed, it will be allowed to cure fully prior to installation;
- Riparian areas will be maintained whenever possible to minimize erosion and impacts to fish habitat, with vegetation removal limited to the width of the workspace footprint. Disturbed areas along the streambanks will be stabilized and allowed to re-vegetate upon completion of work to minimize future erosion;
- Debris and excess materials resulting from construction will be removed from the work site to prevent them reaching water bodies; and
- When using equipment that creates tracks on the surface, run the equipment slowly to create grooves running perpendicular the slope and not parallel to the slope. This type of texture on slopes can slow the speed of runoff and reduce the amount of erosion and sediment transported downhill. This method must also be combined with an additional method of catching sediment at the base of the slope, such as a silt fence, straw log, etc.

SECTION 4 • REFERENCES

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APPENDIX D • WATER QUALITY AND FLOW MONITORING PLAN

AGNICO EAGLE

Meliadine Gold Mine

Water Quality and Flow Monitoring Plan

AUGUST 2021
VERSION 3

EXECUTIVE SUMMARY

The Water Quality and Flow Monitoring Plan (the Plan) has been prepared in accordance with the requirements of the Type A Amended Water Licence 2AM-MEL1631 (the Licence). The Plan is one component of the *Aquatic Effects Management Program* (AEMP) and is closely associated with the *Water Management Plan* and the *Metal and Diamond Mining Effluent Regulations (MDMER)*.

Section 2 of this Plan includes an overview of the monitoring programs and mine development schedule. Section 3 provides specific details (including sampling locations and parameters to be measured) for the compliance monitoring program, along with general guidance for the event monitoring program. An adaptive management program is described for regulated discharge and non-regulated discharges in Section 3. Requirements of the flow monitoring program are described in Section 4, and an overview of the reporting requirements in Section 5. Section 6 provides overview of Quality Assurance / Quality Control practices.

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DOCUMENT CONTROL

Version	Date (YM)	Section	Page	Revision
1	18/12	All	All	Comprehensive plan for Meliadine project. First version composed by Meliadine Environment Department.
2	20/03	All	All	Updated plan formatting and added information on QA/QC as Section 6. Previous Section 5.3.1 (SWTP sampling) moved to GWMP.
3	21/08	All	All	Updated plan to reflect changes in amended MDMER, amended Type A Water Licence and in updated Water Management Plan

Prepared by:

Agnico Eagle Mines Limited - Meliadine Division

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SECTION 1 • INTRODUCTION

The Water Quality and Flow Monitoring Plan (the Plan) has been prepared in accordance with the requirements of the Nunavut Water Board (NWB) Type A Amended Water Licence 2AM-MEL1631 (the Licence). The Plan is one component of the *Aquatic Effects Management Program* (AEMP) and is closely associated with the *Water Management Plan* and the *Metal and Diamond Mining Effluent Regulations (MDMER)*.

The Plan summarizes the monitoring locations, sampling frequency, monitoring parameters, compliance discharge criteria and an adaptive management plan for water quality at the Meliadine Gold Mine.

The purpose of this Water Quality and Flow Monitoring Plan is to establish the program that is to be implemented and followed by AEM's Meliadine environmental management team to monitor the performance of the waste and water management systems at the Meliadine Gold Mine. The program includes:

- Verifying and validating the predicted water quality values with empirical measurements of the mine site water quality and flows;
- A comparison of measured water quality data to compliance requirements stipulated in the Licence; and
- A framework for adaptive management that allows the identification and rectification, where necessary, of unexpected trends or non-compliance in water quality and flows.

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

The objectives of the monitoring program are:

1. To track the chemistry of the contact and non-contact water prior to and during discharge;

2. To assist in identifying if water treatment is required prior to discharge; and

3. To minimize the potential impacts of mining activities on the surrounding environment.

Additional locations outside the footprint of the mine (and outside the scope of this Plan) will be monitored under the *Meliadine Gold Project Aquatic Effects Management Program* (Golder 2016).

SECTION 2 • OVERVIEW OF SITE WATER MANAGEMENT PLAN

Details of overall water management are discussed in the Meliadine Water Management Plan (WMP) which is updated annually. A network of berms, dikes, containment ponds, channels, culverts and sumps are in place and maintained to facilitate water management (Section 3 of WMP).

As specified in the WMP, surface contact water is intercepted, diverted and contained within various containment ponds prior to passive evaporation, treatment and/or discharge. Surface contact water collected in CP3 and CP4 is discharged into Culvert 2 where it flows to CP1. Surface contact water collected in CP5 is discharged into CP1. Surface contact water collected in CP6 is discharged into CP1. Surface contact water collected in CP1 is treated for total suspended solids (TSS) at the EWTP (housed within the WTC) and discharged through the diffuser located in Meliadine Lake.

Saline contact water from the Underground Mine (from saline groundwater) is collected in underground sumps, transported to a clarification system, and subsequently recirculated for use in various underground operations. Excess saline contact water is pumped to surface where it is stored in Saline Pond 1 (SP1), Saline Pond 4 (SP4) and Tiriganiaq Open Pit 2. Saline contact water that is not used for operations is treated at the Saline Effluent Treatment Plant (SETP). The treated water is then trucked to Itivia, Rankin Inlet, and discharged through a diffuser in Melvin Bay.

During the mine closure, the water management infrastructure will remain in place until closure activities are completed and monitoring demonstrates that water quality is acceptable for discharge to the environment without treatment.

SECTION 3 • OVERVIEW OF MONITORING PROGRAMS

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

1. Compliance Monitoring (CM); and
2. Event Monitoring (EM).

3.1 Compliance Monitoring Program (CM)

The CM sites are those stipulated in the Licence; these sites vary from contact water collection ponds, structures such as ditches, culverts prior to discharge to the receiving environment and local lakes surrounding the mine site. The requirements of the Licence, including water quality limits, will be applied at the applicable mine discharge points identified in the CM program.

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

3.2 Event Monitoring Program (EM)

The EM sites result from unexpected events such as spills, accidents, and malfunctions. The response programs for such events are discussed in greater detail in the following four (4) documents:

- Meliadine Spill Contingency Plan (December 2019);
- Meliadine Emergency Response Plan (October 2018);
- Meliadine Freshet Action Plan (March 2020); and
- Meliadine Water Management Plan (August 2021).

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

SECTION 4 • OVERVIEW OF MINE DEVELOPMENT SCHEDULE

The Mine Plan and key mine development activities, including mine waste management are currently used concurrently with the *Water Management Plan*.

The Mine Plan proposes one underground mine (Tiriganiaq Underground Mine) and two open pits (Tiriganiaq Open Pit 1 and Tiriganiaq Open Pit 2) for the development of the Tiriganiaq gold deposit.

The Mine is estimated to produce approximately 15.0 million tonnes (Mt) of ore, 32.8 Mt of waste rock, 8.0 Mt of overburden waste, and 15.0 Mt of tailings. The following phased approach is proposed for the development of the Tiriganiaq gold deposit;

- Phase 1: 3.5 years for Mine Construction (Q4 Year -5 to Year Q2 -1);
- Phase 2: 8.5 years for Mine Operations, beginning in 2019 (Q2 Year -1 to Year 8);
- Phase 3: 3 years Mine Closure (Year 9 to Year 11); and
- Phase 4: Post-Closure (Year 11 forward).

Mining facilities on surface include a plant site and accommodation buildings, an ore stockpile, a tailings storage facility (TSF), two waste rock storage facilities (WRSFs), a water management system that includes containment ponds, water diversion channels, retention dikes/berms, and a series of water treatment plants.

SECTION 5 • MONITORING PROGRAMS

The monitoring program is presented in three sections; requirements of the compliance monitoring program, an overview of the event monitoring program, and then details of the adaptive management program for monitoring results.

5.1 Compliance Monitoring Program

The CM program monitors the chemistry of four local lake surrounding the mine site (E3, G2, H1 and B5) as well as mine contact water collected and diverted at specified locations prior to release into the receiving water environment. The sampling is conducted to confirm and document compliance with regulatory requirements. The nature of water monitored within the CM program include:

- Non-contact water from local lakes;
- Mine surface contact water collected from drainage of different structures;
- Monitoring points located within the water management system prior to release into the receiving water environment; and
- Effluent released to Meliadine Lake and water within Meliadine Lake at the diffuser.

The CM sampling program has multiple monitoring stations across the project site, with sampling at different stages of the mine life. Table 5.1 provides a list of all CM stations, a description of their location, parameters to be monitored and sampling frequency. Specific details for the monitoring parameter groups are provided in Table 5.2. Agnico Eagle follows 5 groups of parameters as identified in Schedule I, Table 1 of the Licence. Additionally, Agnico Eagle follows the analytical requirements and authorized limits of deleterious substances as identified in Schedule 3 and Schedule 4 of the MDMER (Government of Canada, 2002).

Figures 3.1 shows the approximate location of each of the sampling sites. The actual location of each sampling site is determined by access and safety considerations and are marked by a stake that defines the exact location of the collection point for sampling events with appropriate attached signage in English, Inuktitut and French.

GPS coordinates for all compliance monitoring stations were confirmed, as required in Part I, Item 5 of the Licence.

5.1.1 General Sampling and Analysis Program

Samples are collected in clean laboratory-supplied containers and preserved as directed by the analytical laboratory. During all phases, samples are analyzed offsite at a CALA accredited commercial lab (ALS in Burnaby, BV Labs in Nepean, AquaTox in Puslinch, H2Lab in Val d'Or, or Nautilus Environmental in Burnaby). Samples sent to commercial laboratories may change as the site matures and additional requirements occur. Sampling procedures are further detailed in Section 6 (Quality Assurance/Quality Control Procedures) and in the Quality Assurance/Quality Control Plan (Agnico Eagle, 2019).

Table 5.3 summarizes the minimum sample volumes, container, preservation, and holding times for each analyte. This information is from the *USEPA Methods for Chemical Analysis of Water and Waste Water* (*EPA-600/4-79-020, 1983*).

Figure 5.1: Sampling site locations

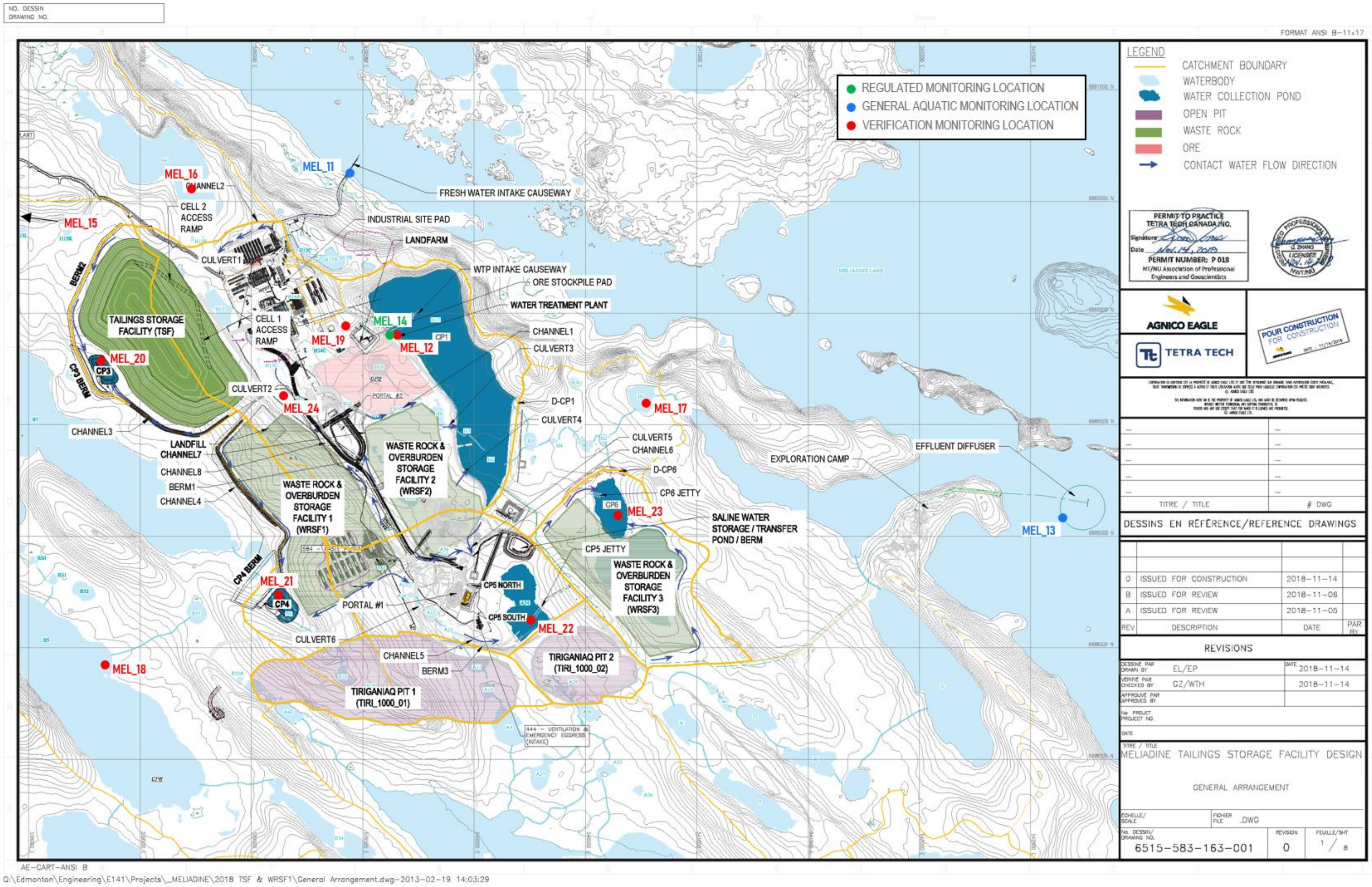

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Table 5.1: Monitoring Program

Station	Description	Phase	Monitoring Parameters	Frequency
Mine Site				
MEL-D-1	Dewatering: Water transferred from lakes to Meliadine Lake during dewatering of lakes	Construction	As defined in the Water Management Plan referred to in Part D, Item 12	Prior to discharge and Weekly during discharge
			Volume (m3)	Daily during periods of discharge
MEL-SR-1 to TBD	Surface Runoff: runoff downstream of Construction areas at Meliadine Site and Itivia Site, Seeps in contact with the roads, earthworks and any Runoff and/or discharge from borrow pits and quarries	Construction, and Operation	As defined in the Water Management Plan referred to in Part D, Item 18	Prior to Construction, Weekly during Construction
			Group 1	Monthly during open water or when water is present upon completion
MEL-11	Water Intake from Meliadine Lake	Construction, Operation, and Closure	Full Suite	Monthly during periods of intake
			Volume (m^3)	Daily during periods of intake
MEL-12	Contact Water Treatment Plant (pre-treatment) coming from CP1, off the pipe and not in the pond	Construction (prior to release), Operations, and Closure	Group 1	Monthly during periods of discharge
MEL-13[(a)] (and AEMP Stations)	Mixing zone in Meliadine Lake and MDMER exposure stations for final discharge point within mixing zone	Construction (prior to release), Operations, and Closure	Full Suite, Group 3 (MDMER)	Monthly during periods of discharge
MEL-14	Contact Water Treatment Plant from CP1 (post-treatment): end of pipe in the plant before offsite release	Construction (upon effluent release), Operations, and Closure	Full Suite, Group 3	Prior to discharge and Weekly during discharge

			Volume (m3)	Daily during periods of discharge
			Acute Lethality	Once prior to discharge and monthly thereafter
MEl-15	Local lake E-3	Operations, and Closure	Group 2	Bi-annually during open water
MEL-16	Local Lake G2	Construction, Operations, and Closure	Group 2	Bi-annually during open water
MEL-17	Local Pond H1	Construction, Operations, and Closure	Group 2	Bi-annually during open water
MEL-18	Local Lake B5	Construction, Operations, and Closure	Group 2	Bi-annually during open water
MEL-19	CP2, Collection of drainage from WRSF3	Construction, Operations, and Closure	Group 1	Monthly during open water or when Water is present
MEL-20	CP3 Collection of drainage from dry stacked tailings	Operations, and Closure	Group 1	Monthly during open water or when Water is present
MEL-21	CP4 Collection of drainage from WRSF1	Operations, and Closure	Group 1	Monthly during open water or when Water is present
MEL-22	CP5 Collection of drainage from WRSF1 and WRSF2	Construction, Operations, and Closure	Group 1	Monthly during open water or when Water is present
MEL-23	CP6 Collection of drainage from WRSF3	Construction, Operations, and Closure	Group 1	Monthly during open water or when Water is present
MEL-24	Seepage from the Landfill between the landfill and Pond H3	Construction, Operations, and Closure	Group 1	Monthly during open water or when Water is present
MEL-25	Secondary containment area at the Itivia Site Fuel Storage and Containment Facility	Construction, Operation, Closure	Group 4, Volume (m3)	Prior to discharge or transfer of Effluent
MEL-26	Melvin Bay end of pipe (before offsite release) for treated saline effluent	Operations, and Closure	MDMER	As per MDMER requirements

Table 5.2: Monitoring Parameters

Group	Parameters
1	pH, turbidity, hardness, total alkalinity, sodium, magnesium, potassium, calcium, chloride, fluoride, silicate, sulphate, total dissolved solids (TDS; calculated[a,b]), total suspended solids (TSS), total cyanide, ammonia nitrogen, nitrate, nitrite, phosphorus, orthophosphate, Total Metals (aluminum, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, thallium, and zinc)
2	**Total and Dissolved Metals**: aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, thallium, tin, titanium, uranium, vanadium, and zinc. **Nutrients**: ammonia-nitrogen, total Kjeldahl nitrogen, nitrate-nitrogen, nitrite-nitrogen, orthophosphate, total phosphorus, total organic carbon, dissolved organic carbon, and reactive silica. **Conventional Parameters**: bicarbonate alkalinity, chloride, carbonate alkalinity, turbidity, conductivity, hardness, calcium, potassium, magnesium, sodium, sulphate, pH, total alkalinity, TDS (calculated[a,b]), TSS, total cyanide, free cyanide, and weak acid dissociable (WAD) cyanide..
3	**MDMER parameters**: total cyanide, arsenic, copper, lead, nickel, zinc, radium-226, TSS, pH, total ammonia and temperature. **MDMER additional requirements**: Effluent volumes and flow rate of discharge, Acutely Lethality tests (Rainbow Trout and Daphnia magna) and environmental effects monitoring (EEM).
4	Total arsenic, total copper, total lead, total nickel, TSS, ammonia, benzene, toluene, ethylbenzene, xylene, total petroleum hydrocarbons (TPH), and pH
Full Suite	Group 2, Total Petroleum Hydrocarbons, Turbidity. Non Acutely-lethal (Rainbow Trout and Daphnia magna) for discharge only.
Flow	Flow data-logger
Field measurements	Field pH, specific conductivity, dissolved oxygen, and temperature.

[(a)]Standard Methods (Method 1030E, American Public Health Association (APHA) 2012. Standard Methods for the Examination of Water and Wastewater, 22nd Edition, with updates to 2015.)
[(b)]TDSCalc (mg/L) = (0.6 x Total Alkalinity as $CaCO_3$) + Sodium + Magnesium + Potassium + Calcium + Sulfate + Chloride + Nitrate + Fluoride + Silicate

Table 5.3: Summary of Sampling Requirements for Each Analyte

Parameters	Matrix Holding Time				Type of Bottle	Preservative	Volume
	Drinking Water	Waste Water	Surface Water	Ground Water (1)			
Microbiology							
Escherichia coli, total coliforms, A.A.H.B	48h	48h	48h	48h	PPS	TS, E	250ml
Enterococcus	48h	48h	48h	48h	PPS	TS, E	250ml
Thermo tolerant coliforms (fecal)	48h	48h	48h	48h	PPS	TS, E	250ml
Inorganic Chemistry							
Absorbance UV, Transmittance UV				24h	P. T. V	N	125ml
Alkalinity, Acidity, Bicarbonates, Carbonates	14d	14d	14d	14d	P, T, V	N	250ml
Ammonia nitrogen (NH_3-NH_4)	28d	28d	28d	28d	P, T, V	AS	125ml
Kjeldahl ammonia (NTK)		28d	28d	28d	P, T, V	AS	125ml
Anions (Cl, F,SO_4)	28d	28d	28d	28d	P, T, V	N	250ml
Color, Free & total Chlorine	48h	48h	48h	48h	P, T, V	N	125ml
Conductivity	28d	28d	28d	28d	P, T, V	N	250ml
Cyanides total/available, Cyanides	14d	14d	14d	14d	P, T, V	NaOH	250ml
BOD_5/Carbonated BOD_5 (2)		48h/4°	48h/4°		P, T, V	N	250ml
COD (chemical oxygen demand)		28d	28d		P, T, V	AS	125ml
Mercury (Hg)	28d	28d	28d	28d	P, T, V	AN	250ml
Total/dissolved metals (filtered on field)	180d	180d	180d	180d	P, T, V	AN	250ml
Dissolved Metals (filtered in the laboratory)	24h	24h	24h	24h	P, T, V	N	250ml
Total suspended solids & Volatile TSS		7d	7d	7d	P. T. V	N	500ml
NH_3 or NH_4		24h	24h	24h	P.T.V	N+AS	2/125ml
Nitrites (NO_2), Nitrates (NO_3), Turbidity	48h	48h	48h	48h	P, T, V	N	250ml
Nitrites-Nitrates (NO_2-NO_3)	28d	28d	28d	28d	P, T, V	AS	250ml
O-Phosphates (O-PO_4)	48h	48h	48h	48h	P, T, V	N	500ml
pH	24h	24h	24h	24h	P, T, V	N	125ml
Total Phosphorus (P-tot)	28d	28d	28d	28d	P, T, V	AS	125ml
Dissolved solids (TDS)		7d	7d	7d	P. T. V	N	250ml
Total solids		7d	7d	7d	P. T. V	N	250ml
Sulphides (H_2S) (3)	28d	28d	28d	28d	P. T. V	AcZn + NaOH	125ml
Thiosulfates	48h	48h	48h	48h	P. T. V	N	125ml
Radioactive & Organic Chemistry							
Fatty resin acids (S-T)	--	28d	28d	--	VA, VT	AS	1L
Congeners PCB (S-T)	28d	28d	28d	28d	VA, VT	N	1L
Chlorobenzene	28d	28d	28d	28d	2 Vial+1 blank	TSS	2/40ml
Total Organic Carbon (TOC)	28d	28d	28d	28d	P, T, V (B)	AC	100ml
Dissolved Organic Carbon (DOC)	48h	48h	48h	48h	P, T, V (B)	N	100ml
Total Inorganic Carbon (CIT)	48h	48h	48h	48h	P, T, V (B)	N	100ml
Phenolic compound (GC-MS)	28d	28d	28d	28d	VA, VT	AS	1L
Glyphosate (S-T)	14d	14d	14d	14d	P.T	N	500ml
PAH	28d	28d	28d	28d	VB	AS	1L
Oil & Greases (total and non-polar)	28d	28d	28d	28d	VA, VT	AS	1L

C10-C50 HP and/or Petroleum Product Identification	28d	28d	28d	28d	VA, VT	AS	1L
Phenol index	28d	28d	28d	28d	VA, VT	AS	500ml
Radium-226	180d	180d	180d	180d	P, T. V	AN	1L
VOC (MAH, CAH, THM, BTEX) (3)	28d	28d	28d	28d	2 Vial+1 blank	TSS	2/40ml

Type of bottle:
P.S.V.T.: plastic bottle, bag or glass bottle with Teflon cap
P, T: Plastic bottle or plastic bottle with Teflon cap
P.T.V.: Plastic bottle or glass bottle with plastic or Teflon cap
PPS: Sterile propyl ethylene bottle
VA: Clear or amber glass with aluminium or Teflon seal
VB: Amber glass (or clear glass covered with aluminium paper) aluminium seal of Teflon
VT: Clear or amber glass bottle with Teflon seal
Preservative:
AC: 0.1ml (100µl) of HCl per 100ml of sample
AcZn: 0.2ml zinc acetate 2N per 100ml of sample and NaOH 10N to pH >9
AN: HNO3 to pH <2
AS: H2SO4 to pH <2
E: 2.5ml EDTA 1.5% (p/v) per 100ml of sample if heavy metals are suspected
ED: 0.1ml diamine ethylene 45 mg/l per 100 ml of sample
EDTA: 1ml EDTA 0.25M per 100ml of sample
N: No preservative
NaOH: NaOH 10N to >12
TS: Sodium thiosulfate final concentration in the sample of 0.1% (p/v)

5.1.2 Compliance Monitoring Stations and Discharge Criteria

Further details of the specific CM stations and discharge criteria stipulated under the Licence are provided below.

Dewatering Activities

All Waters from dewatering activities at Monitoring Program Stations MEL-D-1 through MEL-D-TBD shall be directed to Meliadine Lake and shall not exceed the quality limits presented in Table 3.4 as stipulated in Part D, Item 12 of the Licence.

Table 5.4: TSS and pH Criteria at CM Stations MEL-D-1 through MEL-D-TBD

Parameter	Maximum Average Concentration (mg/L)	Maximum Concentration of Any Grab Sample
Total Suspended Solids (TSS) (mg/L)	15.0	30.0
pH	6.0 to 9.5	6.0 to 9.5

All surface runoff and/or discharge from drainage management systems, at the Monitoring Program Stations MEL-SR-1 to MEL-SR-TBD during the Construction/Operation of any facilities and infrastructure associated with this project, including laydown areas and All-weather Access Road, where flow may directly or indirectly enter a Water body, shall not exceed the Effluent quality limits presented in Table 5.5, as stipulated in Part D, Item 18 of the Licence.

Table 5.5: Effluent Criteria at CM Station MEL-SR-1 to MEL-SR-TBD

Parameter	Maximum Average Concentration	Maximum Concentration of Any Grab Sample
Total Suspended Solids (TSS) (mg/L)	50.0	100.0
Oil and Grease	No Visible Sheen	No Visible Sheen
pH	6.0 to 9.5	6.0 to 9.5

Site Water Collection System

Effluent discharged from CP1 at CM station MEL-14 shall be directed to Meliadine Lake through the Meliadine Lake Outfall Diffuser and shall not exceed the effluent quality limits presented in Table 5.6, as stipulated in Part F, Item 3 of the Licence and within MDMER.

Table 5.6: Effluent Criteria at CM Station MEL-14

Parameter	Unit	Maximum Authorized Monthly Mean Concentration	Maximum Authorized Concentration in a Grab Sample
Conventional Constituents			
pH		6.0 to 9.5[(a)]	6.0 to 9.5[(a)]
Total Dissolved Solids (TDS) (calculated)	mg/L	3,500	4,500
Total Suspended Solids (TSS)	mg/L	15[(a)]	30[(a)]
Nutrients			
Total Ammonia (NH_3-N)	mg-N/L	14	18
Un-ionized Ammonia[(a)]	mg-N/L	0.50	1.00
Total Phosphorous (P)	mg-P/L	2.0	4.0
Total Metals			
Aluminum (Al)	mg/L	2.0	3.0
Arsenic (As)	mg/L	0.3	0.6
Cyanide (CN)	mg/L	0.5	1.0
Copper (Cu)	mg/L	0.2	0.4
Lead (Pb)	mg/L	0.1[(a)]	0.2[(a)]
Nickel (Ni)	mg/L	0.5[(a)]	1.0[(a)]
Zinc (Zn)	mg/L	0.4	0.8
Others			
Total Petroleum Hydrocarbons (TPH) (mg/L)	mg/L	5.0	5.0
Radium 226[(a)]	Bq/L	0.37	1.11

[(a)](MDMER, 2002)

The Discharge of Effluent from the Final Discharge Point at Monitoring Program Station MEL-14 shall be demonstrated to be non-Acutely Lethal under the following test in accordance with the Schedule I of the Licence:

a. Acute Lethality of Effluents to Rainbow Trout (as per Environment Canada's Environmental Protection Series Biological Test Method EPS/1/RM/13 July 1990, published by the Department of the Environment, as amended in December 2000, and as may be further amended from time to time.

Saline effluent discharged at CM station MEL-26 shall be directed to Melvin Bay through a submarine Pipeline and Diffuser and shall not exceed the effluent quality limits presented in Table 5.7, as stipulated in MDMER Schedule 4 (GC, 2002).

Table 5.7: Effluent Criteria at CM Station MEL-26

Parameter	Unit	Maximum Authorized Monthly Mean Concentration	Maximum Authorized Concentration in a Grab Sample
Arsenic (As)	mg/L	0.5	1.0
Copper (Cu)	mg/L	0.3	0.6
Cyanide (CN)	mg/L	1.0	2.0
Lead (Pb)	mg/L	0.2	0.4
Nickel (Ni)	mg/L	0.5	1.0
Zinc (Zn)	mg/L	0.5	1.0
Total Suspended Solids (TSS)	mg/L	15.0	30.0
Radium-226	Bq/L	0.37	1.11
Un-ionized ammonia	mg-N/L	0.50	1.00

The Discharge of Effluent from the Final Discharge Point at Monitoring Program Station MEL-26 shall be demonstrated to be non-Acutely Lethal in accordance with MDMER Division 2, Item 14.2 (GC, MDMER), in which the testing shall be conducted in accordance with the procedures set out in section 5 or 6 of Reference Method EPS 1/RM/190.

Itivia Marshalling Area

Surface water runoff from the bulk fuel tank storage areas is collected within the tank's secondary containment enclosures that are equipped with an HDPE liner; these are designed to contain petroleum products released due to spill events. Water collected in the secondary containment enclosures at CM station MEL-25 is discharged to land in a controlled manner according to the Licence.

All effluent being discharged from the secondary containment enclosures at the Itivia marshalling facility shall not exceed the effluent quality limits presented in Table 5.8, as stipulated in Part F, Item 5 of the Licence.

Table 5.8: Effluent Criteria at CM Station MEL-25

Parameter	Unit	Maximum Authorized Monthly Mean Concentration	Maximum Authorized Concentration in a Grab Sample
pH		6.0 to 9.5	6.0 to 9.5
Total Suspended Solids (TSS)	mg/L	15.0	30.0
Benzene	µg/L	370	370
Toluene	µg/L	2	2
Ethylbenzene	µg/L	90	90
Lead (mg/L)	mg/L	0.1	0.1
Oil and Grease (mg/L)	mg/L	5 and no visible sheen	5 and no visible sheen

Receiving Environment

Receiving water quality monitoring is discussed in the Aquatic Effects Management Program (AEMP) (Golder, 2016) and the Ocean Discharge Monitoring Plan (ODMP) (Agnico Eagle, 2020). Within the AEMP and ODMP are numerous monitoring programs: water quality, sediment quality, benthic invertebrate communities, and fish health and fish tissue chemistry.

5.2 Event Monitoring

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

- Spills, including unidentified seepage (Meliadine Spill Contingency Plan; December 2019); or
- Emergencies (Meliadine Emergency Response Plan; October 2018).

The EM program is designed to verify whether contamination of the surface soil and/or any nearby receiving environment and active zone has occurred as a result of an accidental release of a hazardous material or contaminated water. Verification is done through monitoring of surface runoff and nearby receiving environment during and following remedial activity. It is anticipated that due to the presence of permafrost beneath most of the mine footprint (active layer app 1.5m in depth), there will be minimal impact to groundwater from surface spills or accidental releases.

The EM plan is developed on a site-specific basis subsequent to a spill or other incident, and considers the type of product spilled, the potential receptors and the potential for any remaining contamination after clean-up. The plan is coordinated by the Environment Department.

In the event of an accidental release, the water quality of any downstream receptor as well as an upstream reference (background) is sampled to determine severity of impact. Should the spill have happened over snow cover, as much contaminated snow will be removed as possible. Verification sampling would occur in the area after thaw to determine if the clean-up is complete or if further remediation is necessary. The specific parameters monitored as part of the EM program will depend on the nature of the spill and will be determined for the specific material released.

The EM program for a particular spill will cease upon obtaining satisfactory analytical results from the potentially affected areas or as required by regulators.

5.3 Adaptive Management Program

Results of the water quality monitoring are reviewed by the Meliadine Environment Department. Chemical trends of constituents of interest are tracked for mine site monitoring and for the AEMP program. This allows for early detection of significant changes in water quality within the mine site prior to discharge. If triggers and thresholds, such as in the AEMP program, are exceeded in the receiving environment action plans are then implemented to ensure that environmental protection objectives are met.

An adaptive management program has been designed for the Meliadine Gold Project to evaluate the monitoring data and provide a framework for action, if necessary. The program has two levels - a trigger level to compare the monitoring data against, and an action plan of mitigative measures for identified exceedances.

The adaptive management program is divided into two sections, one for parameters with regulated discharge criteria at specific monitoring locations, as specified in the Licence and by the Metal Diamond Mining Effluent Regulations (MDMER). The second section is for measured parameters for which no discharge limits have been identified in the Licence such as those in the AEMP or EEM.

5.3.1 Adaptive Management Program for Regulated Discharge

Action Plan

In the case of an exceedance of a Licence limit or MDMER discharge limit, an action plan will be implemented. The adaptive management program requires that if one or more of the key monitored parameters exceed the respective limits, a staged sequence of responses will follow. Table 5.9 summarizes the staged adaptive action plan for the CM program for regulated discharge. Figure 5.2 is a logic diagram showing the decision path for evaluating analytical results for regulated discharges.

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

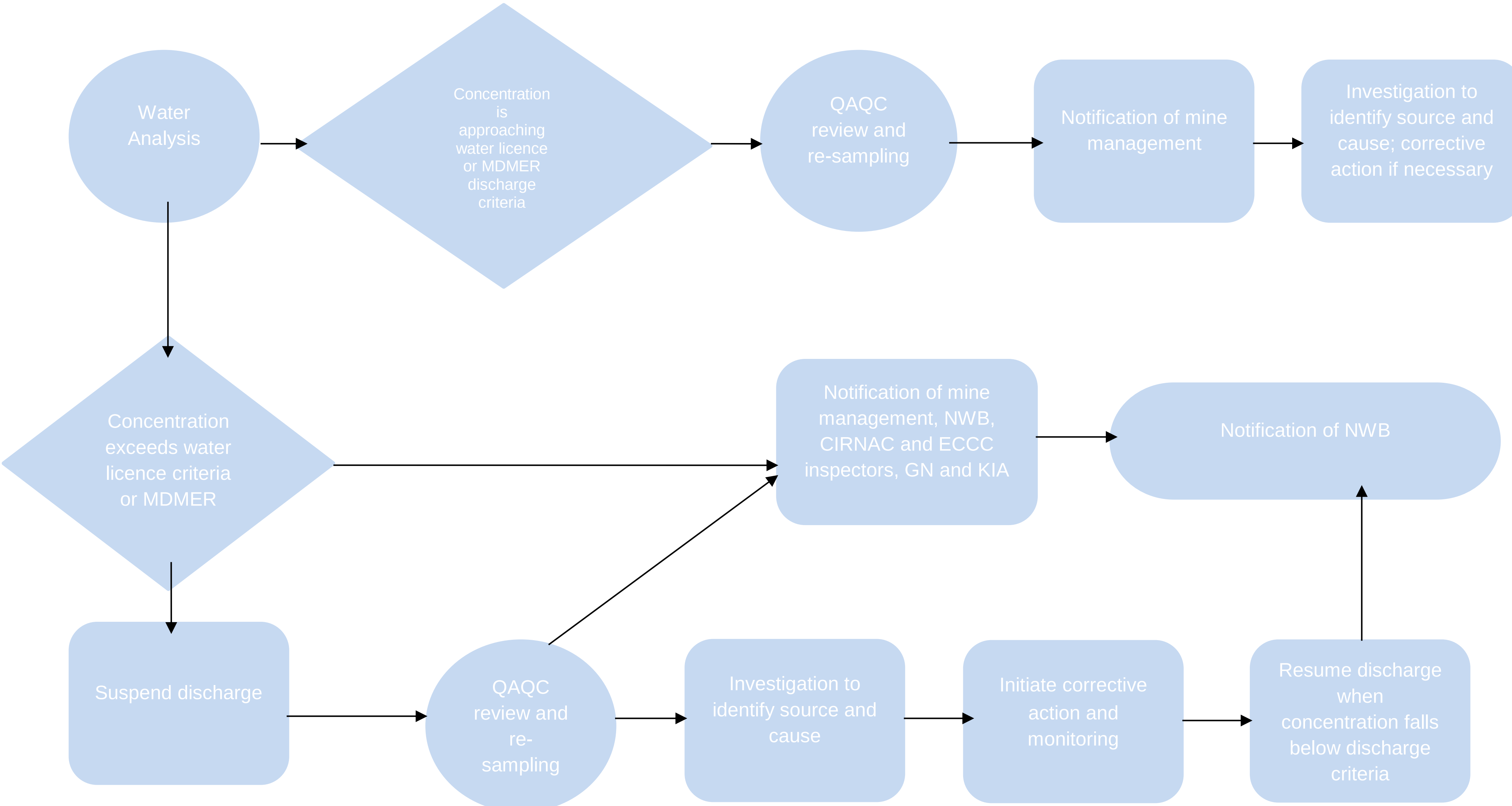
- Best management practices for sediment and erosion control would be employed to reduce TSS concentrations (i.e., flow control, sedimentation basin construction silt fencing, etc; see Sediment and Erosion Management Plan);
- Addition of a coagulant for the reduction of TSS in pond water;
- Use of geotextile or re-armoring of banks to filter and reduce TSS in pond/ditch water;
- Deployment of absorbent booms and/or barriers within ponds to isolate surface petroleum hydrocarbon films for removal and/or treatment;
- Adjustments to on-site sewage treatment for the reduction of BOD and E. coli concentrations;
- Addition of lime to increase a low pH value or reduce metal concentrations;
- Removal of the offending source rock or the prevention of surface waters coming into contact with the offending source rock in the case of ARD; and/or

- Implementation of the Freshet Action Plan to proactively identify any issues around areas of concern; conduct additional monitoring, and control and contain seepage or movement of TSS on site.

Table 5.9: Action Plan for Regulated Discharge

Example	Action Plan
Exceeds water licence discharge criteria or MDMER	1. Suspension of discharge activities; 2. QA/QC review and analysis, and re-sample water at the particular location if necessary; 3. Notification of mine management (General Mine Manager or designate and Environment Superintendent, or designate) and the regulators: Nunavut Water Board, CIRNAC and ECCC inspectors, GN and the Kivalliq Inuit Association; 4. Investigation to identify possible source(s) and cause(s) of the exceedance; 5. Initiation of corrective actions or water treatment, and follow up monitoring; and 6. Resumption of discharge when concentrations are below the discharge criteria

Figure 5.2: Logic Diagram for Regulated Discharge



AGNICO EAGLE

5.3.2 Adaptive Management Program for Non-Regulated Discharge

Aside from targeted monitoring studies (i.e. "Effects Assessment Studies") such as those following construction, the AEMP is the main program aimed at measuring and assessing potential impacts of contaminants in the receiving aquatic environment that are not regulated under MDMER or NWB. This program combines with the Environmental Effects Monitoring (EEM) required under MDMER.

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

AEMP Action Level and Significance Threshold

The AEMP Response Framework links monitoring results to management actions, with the purpose of maintaining the assessment endpoints within acceptable ranges. It is a systematic approach for evaluating AEMP results and responding appropriately, such that potential unexpected effects are identified and mitigation is undertaken to reduce or reverse them, thereby preventing the occurrence of a significant adverse effect. This is accomplished by continually evaluating monitoring data and implementing follow-up actions (e.g., confirmation, further study, mitigation) at pre-defined levels of change in measurement endpoints (i.e., Action Levels). For purposes of this Response Framework, the following terms are used: effect, normal range, benchmark, Action Level, and Significance Threshold.

Action Level – Action Levels (Low, Moderate, and High) are pre-defined levels of environmental change that exceeds normal ranges or benchmarks, or results of statistical tests, or a combination of these. For example, exceedance of the normal range and approach of a benchmark by a water quality parameter in the near-field exposure area may be defined as the Low Action Level. A change that falls within the normal range of variability for the study area would not trigger an Action Level.

Significance Threshold – The Significance Threshold, for the purposes of an AEMP Response Framework, is a magnitude of change that would result in significant adverse effects. It is a clear statement of environmental change that must never be reached. The AEMP Response Framework is designed to prevent reaching the significance threshold for all assessment endpoints.

Action Levels

The proposed Action Levels are designed to provide an early warning indication of potential adverse effects to plankton and benthos (i.e., food for fish), to fish health, and to the assurance of normal ecological function (including water quality and sediment quality). The proposed Low Action Levels (Table 8-2 and 8-3) are designed such that changes of sufficient magnitude to trigger a Low Action Level response are reported, documented, investigated, and ultimately addressed (i.e., mitigation measures or operation changes are implemented) before Significance Thresholds would ever be reached; if a Low Action Level is reached, Medium and High Action Levels (with response actions) are developed to provide further adaptive management guidance to the Mine to avoid reaching the Significance Thresholds. The type of management response taken after reaching an Action Level will depend on the type and magnitude of effect observed.

Further details on AEMP action levels and significance thresholds are provided in Golder (2016).

SECTION 6 • QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Quality Assurance (QA) refers to plans or programs that encompass a wide range of internal and external management and technical practices designed to ensure the collection of data of known quality that matches the intended use of the data. Quality Control (QC) is a specific aspect of QA that refers to the internal techniques used to measure and assess data quality. Specific QA and QC procedures that will be followed during compliance-related sampling are described in Section 6.1 and 6.2 and are further detailed in the Quality Assurance/Quality Control Plan (Agnico Eagle, 2019).

6.1 Quality Assurance

Quality assurance protocols are diligently followed so data are of known, acceptable, and defensible quality. There are three areas of internal and external management, which are described in the following three sections.

6.1.1 Field Staff Training and Operations

To make certain that field data collected are of known, acceptable, and defensible quality, field staff are trained to be proficient in standardized field sampling procedures, data recording, and equipment operations applicable to the monitoring program. All field work will be completed according to specified instructions and established technical procedures for standard sample collection, preservation, handling, storage, and shipping protocols. Thus, minimizing risk of operational errors.

6.1.2 Laboratory

To make sure that high quality data are generated, external CALA accredited laboratories have been selected for sample analysis. Accreditation programs are utilized by the laboratories so that performance evaluation assessments are conducted routinely for laboratory procedures, methods, and internal quality control.

The assay lab at the Mine site is not an accredited laboratory but will be used periodically for “real-time” results for some parameters like pH, total suspended solids, and Weak Acid Dissociable Cyanide. These results are for observational purposes and do not meet the standards of an accredited laboratory.

6.1.3 Office Operations

A data management system is utilized so that an organized consistent system of data control, data analysis, and filing will be applied to the monitoring program. Relevant elements will include, but are not limited to the following:

- All required samples are collected;
- sampling stations are clearly identified, and GPS coordinates collected and stored;
- chain-of-custody and analytical request forms are completed correctly (as per Agnico Eagle 2019);

- proper labelling and documentation procedures are followed, and samples will be delivered to the appropriate locations in a timely manner;
- laboratory data will be promptly reviewed once they are received to validate data quality;
- appropriate logic checks will be completed to ensure the accuracy of the calculations.

6.2 Quality Control

The QC component consists of applicable field and sample handling procedures, and the preparation and submission of two types of QC samples to the various laboratories involved in the program. The QC samples include blanks (e.g., travel, field, equipment) and duplicate/split samples.

Sample bottle preparation, field measurement and sampling handling QC procedures include the following:

- New laboratory supplied containers are used for sample collection. The bottles are either polyethylene plastic or glass, dependent on the specific parameter being analyzed.
- Sample bottles are kept in a clean environment, capped at all times, and stored in clean shipping containers. Samplers keep their hands clean, wear gloves, and refrain from eating or smoking while sampling.
- All bottles are identified with station number and date of collection.
- Where sampling equipment must be reused at multiple sampling locations, sampling equipment is cleaned appropriately between locations.
- Temperature, pH, and specific conductivity are measured in the field using hand held meters such as HACH test kit – 2100 Q Portal Turbidimeter (turbidity), Oakton PCS35 Meter (pH and conductivity), and Eureka Manta II (pH, dissolved oxygen and conductivity). The instruments are calibrated before each sample event to ensure optimal performance and record of the calibration are kept in a Calibration log. Maintenance procedures will be followed as set out by the supplier's operation manual.
- Samples are cooled to between 4 °C and 10˚C as soon as possible after collection, and maintained at approximately 4 °C in a refrigerator until shipping. Care is taken when packaging samples for transport to the laboratory to maintain the appropriate temperature (between 4°C and 10˚C) and minimize the possibility of rupture. Where appropriate, samples are treated with laboratory-provided preservatives to minimize physical, chemical, biological processes that may alter the chemistry of the sample between sample collection and analysis.
- Samples are shipped to the laboratory as soon as reasonably possible to minimize sample hold times. If for any reason, samples do not reach the laboratory within the maximum sample hold time for individual parameters, the results of the specific parameters will be qualified, or the samples will not be analysed for the specific parameters.
- Chain of custody sample submission forms are completed by field sampling staff and submitted with the samples to the laboratory. Furthermore, an electronic copy is emailed to the laboratory upon shipping and a second electronic copy is maintained at the Mine Site for reference.

- Only staff with the appropriate training in the applicable sampling techniques conduct water sampling.

Quality control procedures implemented consist of the preparation and submission of QA/QC samples, such as field blanks, trip blanks, and duplicate water samples. These are defined as follows:

- Field Blank: A sample prepared in the field using laboratory-provided deionized water to fill a set of sample containers, which is then submitted to the laboratory for the same analysis as the field water samples. Field blanks are used to detect potential sample contamination during collection, shipping and analysis.
- Travel Blank: A sample prepared and preserved at the analytical laboratory prior to the sampling trip using laboratory-provided deionized water. The sample remains unopened throughout the duration of the sampling trip. Travel blanks are used to detect potential sample contamination during transport and storage.
- Duplicate Sample: Two samples collected from a sampling location using identical sampling procedures. They are labelled, preserved individually and submitted for identical analyses. Duplicate samples are used to assess variability in water quality at the sampling site. Duplicates are collected and submitted for analyses at approximately 10% of sampling locations. For smaller batches of samples (less than 10), at least one duplicate will be collected and submitted for analysis. Upon receipt of analytical results, the field/trip blank and duplicate analyses are verified for potential contamination and accuracy, respectively. Results are interpreted, and recommended actions are taken if necessary.

SECTION 7 • FLOW VOLUMES

Where applicable, flow volumes within the mine footprint will be tracked daily during periods of discharge. Flow volume measurements will be conducted using volumetric flow meters attached to applicable pumps or by applying pump time and capacity methods when flow meters are not possible (e.g., when a power source is not available). For applicable permanent pumping arrangements, such as fresh water pumping systems, flows will be measured using permanent in line flow meters. For periodic batch discharges, such as secondary containment sumps, portable flow meters or calculated pump time and capacity methods will be used.

The monitoring locations for water flow volumes, in accordance with Part I, Item 9, and Table 2 of the Licence, include:

- The volume of fresh Water obtained from Meliadine Lake at Monitoring Program Station MEL-11;
- The volume of fresh Water transferred to the Meliadine Lake during lakes' dewatering activities;
- The volume of fresh Water obtained along the road and Meliadine River for dust suppression activities;
- The volume of Effluent discharged from Final Discharge Point at Monitoring Program Station MEL-14;
- The volume of reclaim Water obtained from CP1;
- The volume of Effluent discharged onto tundra at Monitoring Program Station MEL-25 or transferred to CP1 from the Itivia Site Fuel Storage and Containment Facility; and
- The volume of Effluent and Fresh Water transferred to the pits during pits' flooding.

SECTION 8 • REPORTING

Reporting of water quality results is to be conducted on two levels a) monthly and annually with the results of the monitoring program and per MDMER requirements and b) in response to exceedances.

8.1 Annual Reporting

An annual report is to be submitted to the NWB, KIA, Department of Fisheries and Oceans, Crown-Indigenous Relations and Northern Affairs Canada, Nunavut Impact Review Board, Government of Nunavut, and other interested parties by March 31st of the following year. The report is to summarize the following:

- Monitoring results for each sampling station during the year and for the life of mine (construction to end of closure); activities during the year at each station; and any exceedances at stations, the action plan applied to the exceedance, and the results of the action plan;
- Annual seep water chemistry results; including location of the samples, sources of the water collected, and results of chemical analyses of the samples;
- Receiving water monitoring results;
- Spills and any accidental releases; event monitoring activities conducted following containment, remediation, and reclamation; and the results of EM program, any exceedance in EM results, and the action plan following the exceedance;
- Measured flow volumes;
- Effluent flow rates, volumes and calculated chemical loadings following the requirements of MDMER; and
- Results of QA/QC analytical data.

8.2 Exceedance Reporting

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

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

SECTION 9 • REFERENCES

Agnico Eagle. 2019. Meliadine Gold Project Quality Assurance/Quality Control Plan. Version 3. 6513-QQY-01. March 2019.

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Golder Associates Ltd. 2016. Aquatic Effects Monitoring Program (AEMP) Design Plan. Version 1. June 2016. 6513-REP-03.

Government of Canada. (2002). Metal and Diamond Mining Effluent Regulations. SOR/2002-222. Minister of Justice of Canada. Current to July 26, 2021, last amended on June 10, 2021.