APPENDIX 8-B

Addendums for Waste, Domestic Waste and Operational Infrastructure Management Plans

June 2016
Report No. 1541520

AGNICO EAGLE

Golder Associates

8-B.2: Water Management Plan

ADDENDUM

AGNICO EAGLE

Project Name:	Meadowbank Gold Project	
Plan / Version:	Water Management Plan	Version WT; June 2016
NIRB Requirement:	Project Certificate No. 004	**Condition:** not applicable
NWB Requirement:	2AM-MEA-1525	**Condition:** Part E, Item 7 and 8
Addendum:		
Section Change	**Specify: Update or New**	**Details**
Appendix H	New	WT Addendum

AGNICO EAGLE

Meadowbank Division

WHALE TAIL PIT

Water Management Plan Addendum

JUNE 2016
VERSION WT

EXECUTIVE SUMMARY

Agnico Eagle Mines Limited – Meadowbank Division (Agnico Eagle) is proposing to develop Whale Tail Pit and Haul Road Project (Project), a satellite deposit located on the Amaruq property, to extend mine operations and milling at Meadowbank Mine.

The proposed open pit mine, mined by truck-and-shovel operation, will produce 8.3 million tonnes (Mt) of ore, 46.1 Mt of waste rock, and 5.6 Mt of overburden waste. For the purposes of the water management planning, Agnico Eagle has considered four phases to the development: 1 year of construction, 3 years of mine operations, 8 years of closure, and the post-closure period.

The water management objectives are to minimize potential impacts to the quantity and quality of surface water at the mine site. Water management structures (water retention dikes/berms and diversion channels) will be constructed, dependent on the potential presence and volume of water, to contain and manage the contact water from the areas affected by the mine or mining activities. The major water management infrastructure includes: two contact water ponds, three water diversion channels, four water retention dikes, and two Water Treatment Plants (WTP).

Consistent with the approved Meadowbank Mine Water Management plan, this Addendum for Whale Tail Pit describes the main objectives pertaining to water management which are to limit and/or stop the flow of surface water runoff in the pit and to limit the impact on the local environment. In developing the water management plan, the following principles were followed:

- keep the different water types separated as much as possible;
- control and minimize contact water through diversion and containment;
- minimize freshwater consumption by recycling and reusing the contact and process water wherever feasible; and
- meet discharge criteria before any site contact water is released to the downstream environment.

During mine construction and operations, contact water originating from affected areas on surface will be intercepted, diverted and collected within the various collection ponds. The collected water on the mine site will be eventually pumped and stored in the Whale Tail Attenuation Pond, where the contact water will be treated by the WTP prior to discharge to the receiving environment or reused in the operations.

During operations, site contact water quality is predicted to exceed the Portage effluent criteria of the Meadowbank Water Licence for arsenic and total dissolved solids in Whale Tail Waste Rock Storage Facility (WRSF) Pond and in Whale Tail Pit sump. This water will be controlled by constructing the Whale Tail WRSF Dike and the Whale Tail Attenuation Pond. The Whale Tail WRSF Pond water will report with all other contact water and will be mixed in the Whale Tail Attenuation Pond and treated

during operations. Through best management practices and mitigation, the predicted water quality of Whale Tail Lake (North Basin) meets aquatic life guidelines post-closure.

During operations when the mine is at its maximum footprint, the conservative predictions of future water quality indicate that most parameter concentrations in the downstream environment are below CEQG-AL except for arsenic. As per Nunavut Water Board (NWB) Type A Water Licence 2AM-MEA1525 Part E Item 7 and 8 requirements, a site wide water balance will be updated as part of the annual water management plan and end pit water quality modelling will be conducted to update these predictions.

As per NWB Type A Water Licence 2AM-MEA1525 Part E Item 7, the Licensee shall not breach dikes until the water quality in the flooded area meets Canadian Council of Ministers of the Environment Water Quality Guidelines, baseline concentrations or appropriate site specific water quality objectives. During mine closure, no mine discharges will occur to the downstream receiving environment since all contact waters are diverted to the open pit and Whale Tail Lake (North Basin) for re-flooding. The water quality in open pit and Whale Tail Lake (North Basin) averaged over the closure period is predicted to be similar to that of the last year of operations, with similar maximum and average concentrations.

DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
WT	June 2016			The Water Management Plan as Supporting Document for Type A Water Licence Application, submitted to Nunavut Water Board for review and approval	Agnico Eagle Meadowbank Division and Golder Associates Ltd.

TABLE OF CONTENT

List of Tables

LIST OF FIGURES

LIST OF APPENDICES

ACRONYMS

Agnico Eagle	Agnico Eagle Mines Limited – Meadowbank Division
CCME	Canadian Council of Ministers of the Environment
DFO	Department of Fisheries and Oceans Canada
NWB	Nunavut Water Board
OMS	Operation, Maintenance, and Surveillance
PGA	Peak Ground Acceleration
Plan	Water Management Plan
Project	Whale Tail Pit
STP	Sewage Treatment Plant
TSS	total suspended solids
WRSF	Waste Rock Storage Facility
WSER	Wastewater System Effluent Regulations
WTP	Water Treatment Plant

UNITS

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

SECTION 1 • INTRODUCTION

Agnico Eagle Mines Limited – Meadowbank Division (Agnico Eagle) is proposing to develop Whale Tail Pit and Haul Road Project (Project), a satellite deposit located on the Amaruq property, to continue mine operations and milling at Meadowbank Mine. Agnico Eagle is seeking approval to extend Meadowbank Mine to include development of resources from Whale Tail Pit. Concurrent with the reconsideration of the Project Certificate by the Nunavut Impact Review Board, Agnico Eagle is seeking an amendment to Meadowbank Mine Type A Water Licence (No. 2AM-MEA1525) to include mining of Whale Tail Pit and construction and operations of associated infrastructure from the Nunavut Water Board (NWB).

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

The proposed open pit mine, mined by truck-and-shovel operation, will produce 8.3 million tonnes (Mt) of ore, 46.1 Mt of waste rock, and 5.6 Mt of overburden waste. There are four phases to the development: 1 year of construction, 3 years of mine operations, 8 years of closure, and the post-closure period.

The construction and preparation of material will begin as soon as permits and authorizations are received and construction of the dikes is anticipated to start in the second quarter of Year -1 (2018). Focus on site preparation and construction of infrastructure, with the development of the open-pit to produce construction material will continue in 2018. During this first phase, waste rock and overburden will be piled in the Whale Tail Waste Rock Storage Facility (Whale Tail WRSF) and ore stockpiled on the ore pads. The operational phase will span approximately 3 years, from Year 1 (2019) to Year 4 (2022). Mining activities are expected to end in Year 3 (2021) and ore processing is expected to end during the first quarter of Year 4 (2022). Closure will occur from Year 4 (2022) to Year 11 (2029) after the completion of mining and will include removal of the non-essential site infrastructure and flooding of the mined-out open pit as well as reestablishment of the natural Lake A17 (Whale Tail Lake) level. Only essential infrastructure related to water treatment will remain on site during the closure and post-closure phases. Accordingly, in addition to the Water Treatment Plant (WTP), a part of the camp, including all infrastructure allowing camp autonomy and security, as well as site roads, will be maintained following the operational phase (see more information in Whale Tail Pit Interim Closure and Reclamation Plan). Site and surrounding environment monitoring will start from the beginning of the construction and be completed during the post-closure phase when it is shown that the site and water quality meets the regulatory closure objectives. Table 1.1 summarizes the overview of the timeline and general activities.

Table 1.1 Overview of Timeline and General Activities

Phase	Year	General Activities
Construction	Year -1	• Constructing site infrastructure • Developing open-pit mine • Stockpiling ore
Operations	Year 1 to 3	• Open-pit operations • Trucking ore to Meadowbank
	Year 4	• Complete trucking ore to Meadowbank
Closure	Year 4 to 11	• Remove non-essential site infrastructure • Mined-out open pit flooding • Reestablishment of the natural Lake A17 (Whale Tail Lake) level • Site and surrounding environment monitoring
Post-Closure	Year 11 forward	• Site and surrounding environment monitoring

This document presents the Water Management Plan (Plan) as an Addendum to the NWB approved Meadowbank Water Management Plan to support the Amendment to the Type A Water Licence Application. Agnico Eagle has applied the same water management and water balance approach in this document as is used for the annual Meadowbank Mine Water management report (Agnico Eagle 2015a). The purpose of this Addendum is to provide consolidated information on water management, required water management infrastructure and water balance for the operations of Whale Tail Pit as a satellite pit for the Meadowbank Mine.

Once approval for Whale Tail Pit has been granted, this Plan will be updated as required as per NWB Type A Water Licence Part E Item 7 and 8 requirements to reflect any changes in operations or economic feasibility occurs, and to incorporate new information and the latest technology, where appropriate.

SECTION 2 • BACKGROUND INFORMATION

2.1 Site Conditions

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

2.1.1 Climate

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

The Project is located in an arid arctic environment that experiences extreme winter conditions, with an annual mean temperature of -11.3 degrees Celsius (°C). The monthly mean temperature ranges from -31.3°C in January to 11.6°C in June, with above-freezing mean temperatures from June to September. The annual mean total precipitation at the Project is 249 millimetres (mm), with 59 percent (%) of precipitation falling as rain, and 41% falling as snow. Mean annual losses were estimated to be 248 mm for lake evaporation, 80 mm for evapotranspiration, and 72 mm for sublimation. Mean annual temperature, precipitation, and losses characteristics are presented in Table 2.1.

Short-duration rainfall, representative of the Project are presented in Table 2.2, based on intensity-duration-frequency curves available from the Baker Lake A meteorological station (Station ID 2300500) operated by the Government of Canada (2015).

Y:\burnaby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\99_PROJECTS\1541520_FEIS\02_PRODUCTION\FEIS\MXD\1300_Documentation\1340_Project_Description\Report\WATER_MANAGEMENT_PLAN\1541520_FIG_2-1_PROJECT_LOCATION.mxd

560000 580000 600000 620000 640000 660000 680000 700000 720000

7260000 7240000 7220000 7200000 7180000 7160000 7140000

N

Whale Tail Pit

Meadowbank Mine to Whale Tail (71.5 km)

Vault Pit

Baker Lake to Meadowbank Mine (107.5 km)

Baker Lake

Pipedream Lake

Tehek Lake

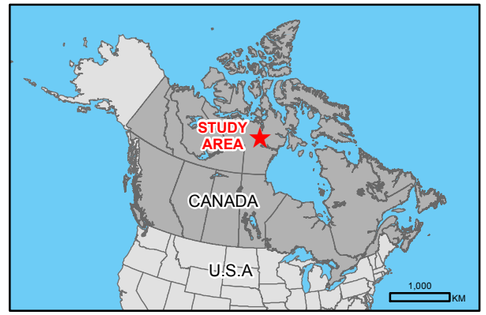
Schultz Lake

Baker Lake

7012 7012 7014 7014 7001 7009 7001 7013 7016 7016 7912

LEGEND

- COMMUNITY
- PROPOSED HAUL ROAD
- ALL WEATHER ROAD
- WHALE TAIL PIT
- MEADOWBANK OPERATION AND INFRASTRUCTURE
- CLAIM BOUNDARY
- WATERCOURSE
- WATERBODY



REFERENCE

1. HAUL ROAD OBTAINED FROM AGNICO EAGLE MINES LIMITED. 2015-10-14 FROM 6103-117-230-200_R0.dwg
2. CLAIM BOUNDARIES OBTAINED FROM AGNICO EAGLE MINES LIMITED.
3. WATERCOURSE AND WATERBODY DATA OBTAINED FROM CANVEC © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
4. INSET MAP DATA OBTAINED FROM ESRI.

DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 14

12 0 12
KILOMETRES

PROJECT

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION
WHALE TAIL PIT PROJECT

TITLE

LOCATION OF THE PROJECT

Golder Associates

PROJECT		1541520	FILE No.	
DESIGN	JR	24 Mar. 2016	SCALE AS SHOWN	REV. 0
GIS	CDB	11 May 2016		
CHECK	SO	06 Jun. 2016		
REVIEW	LY	06 Jun. 2016		

FIGURE 2.1

Table 2.1 Estimated Mine Site Monthly Mean Climate Characteristics

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

[a] SNC (2015).

°C = degrees Celsius; mm = millimetre.

Table 2.2 Estimated Mine Site Extreme 24-Hour Rainfall Events

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

[a] SNC (2015).

mm = millimetre.

2.1.2 Permafrost

The mine site is located in an area of continuous permafrost, as shown on Figure 2.2. Based on measurements of ground temperatures (Knight Piésold 2015), the depth of permafrost at the mine

site is estimated to be in the order of 425 metres (m) outside of the influence of waterbodies. The depth of the permafrost and active layer will vary based on proximity to the lakes, overburden thickness, vegetation, climate conditions, and slope direction. The typical depth of the active layer is 2 m in this region of Canada.The typical permafrost ground temperatures at the depths of zero annual amplitude (typically at the depth of below 15 m) is approximately -8.0 °C in the areas away from lakes and streams. The geothermal gradient measured is 0.02 degrees Celsius per metre (°C/m) (Knight Piésold 2015). Late-winter ice thickness on freshwater lakes is approximately 2.0 m. Ice covers usually appear by the end of October and are completely formed in early November. The spring ice melt typically begins in mid-June and is complete by early July.

Groundwater characteristics at the mine site are detailed in Volume 6, Section 6.2, and are briefly summarized herein.

Two groundwater flow regimes in areas of continuous permafrost are generally present:

- a deep groundwater flow regime beneath the base of the permafrost; and
- a shallow flow regime located in an active (seasonally thawed) layer near the ground surface.

From late spring to early autumn, when temperatures are above 0˚C, the active layer thaws out. Within the active layer, the water table is expected to be a subdued replica of topography, and is expected to parallel the topographic surface. Project area groundwater in the active layer flows to local depressions and ponds that drain to larger lakes at velocities estimated to range from about 0.004 m/day to 0.08 m/day.