APPENDIX 8-E

Addendums for Environmental Protection and Monitoring Plans

June 2016
Report No. 1541520

AGNICO EAGLE

Golder Associates

8-E.5: Operational ARD/ML Sampling and Testing Plan

ADDENDUM

AGNICO EAGLE

Project Name:	Meadowbank Gold Project	
Plan / Version:	Operational ARD/ML Testing and Sampling Plan	Version WT; June 2016
NIRB Requirement:	Project Certificate No. 004	**Condition:** not applicable
NWB Requirement:	2AM-MEA-1525	**Condition:** Part B, Item 13 Schedule B, Item 7

Addendum:		
Section Change	**Specify: Update or New**	**Details**
Appendix B	New	WT Addendum

AGNICO EAGLE

Meadowbank Division

Operational ARD-ML Sampling and Testing Plan – Whale Tail Pit Addendum

JUNE 2016
VERSION WT

EXECUTIVE SUMMARY

Agnico Eagle Mines Limited – Meadowbank Division (Agnico Eagle) is proposing to develop Whale Tail Pit (Project), a satellite deposit located on the Amaruq property, to continue mine operations and milling at Meadowbank Mine. Agnico Eagle is seeking approval to expand Meadowbank Mine to include development of resources from Whale Tail Pit. Concurrent with the reconsideration of the Project Certificate by the NIRB, 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.

Mining facilities include accommodation buildings, two ore stockpiles, one overburden stockpile, one rock storage facility area planned to receive waste rock and waste overburden, a water management system that includes collection ponds, water diversion channels, and retention dikes/berms, and a Water Treatment Plant.

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 operation, 8 years of closure, and the post-closure period.

Waste rock, overburden and lake sediment were sampled and tested as part of a geochemical program presented in Golder (2016). Among the 8 lithologies tested, 3 can be used as construction and closure rock. The remaining lithologies are either potentially acid generating and/or metal leaching rock. The overburden is non-potentially acid generating and non-metal leaching while the lake sediment is potentially acid generating and metal leaching.

An approach is proposed to define if the waste rock lithologies can be used as construction/closure material or must be piled in the Whale Tail Waste Rock Storage Facility.

DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
WT	June 2016			The Operational ARD-ML Sampling and Testing Plan as Supporting Document for Type A Water Licence Application, submitted to Nunavut Water Board for review and approval	Golder Associates Ltd.

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ACRONYMS

ABA	Acid-Base Accounting
Agnico Eagle	Agnico Eagle Mines Limited – Meadowbank Division
ARD	Acid Rock Drainage
HCT	Humidity Cell Test
INAC	Indian and Northern Affairs Canada
LOM	Life of Mine
MEND	Mine Environment Neutral Drainage
MPA	Maximum Potential Acidity
ML	Metal Leaching
NIRB	Nunavut Impact Review Board
NWB	Nunavut Water Board
NP	Neutralization Potential
NPR	Net Potential Ratio
NPAG	Non-Potentially Acid Generating
PAG	Potentially Acid Generating
Project	Whale Tail Pit
QA/QC	Quality Assurance / Quality Control
SFE	Shake Flask Extraction
TDS	Total Dissolved Solids
WRSF	Waste Rock Storage Facility

UNITS

%	percent
kg	kilogram(s)
km	kilometer(s)
km^2	square kilometer(s)
Mt	million tonne(s)
t	tonne(s)
wt%	weight percent

SECTION 1 • INTRODUCTION

Agnico Eagle Mines Limited – Meadowbank Division (Agnico Eagle) is proposing to develop Whale Tail Pit and Haul Road (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 (NIRB), Agnico Eagle is seeking an amendment to Meadowbank Mine Type A Water Licence (No. 2AM-MEA1525; NWB 2015) 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.

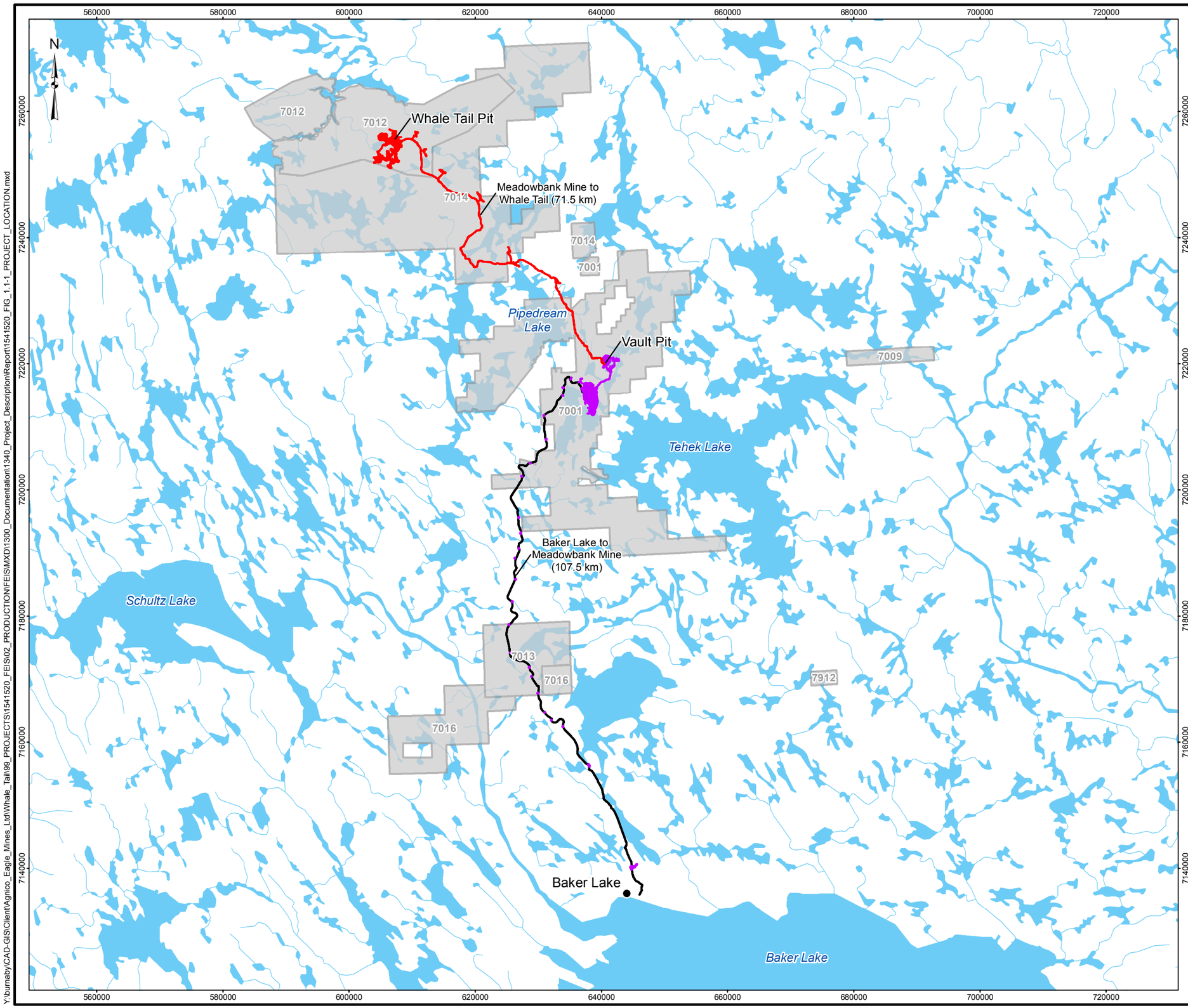
The general mine site location for the Project is presented in Figure 1.1.

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 operation, 8 years of closure, and the post-closure period.

This document presents the Operational Acid Rock Drainage (ARD) and Metal Leaching (ML) Sampling and Testing Plan (Plan) to support the Type A Water Licence Application. The Plan is closely associated with the Mine Waste Rock and Tailings Management Plan (Agnico Eagle 2016a, or Volume 8, Appendix 8-A.1) and the Water Management Plan (Agnico Eagle 2016b, or Volume 8, Appendix 8-B.2).

The objectives of the Plan are to define the sampling, analysis, and testing procedures that are to be implemented to define the acid generating and metal leaching potential of waste rock for the Project. This characterization is to be used by mine staff to ensure that waste rock, overburden (till), and lake sediments are identified, managed, segregated and disposed of in an environmentally appropriate manner, as designated in the Plan. The Plan will also define if the waste rock, the overburden, and the lake sediment can be used as construction/closure material.

This Plan will be updated as required to reflect any changes in operation or economic feasibility occurs, and to incorporate new information and latest technology, where appropriate.



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	24 Mar. 2016		
CHECK	JR	09 May 2016		
REVIEW	LY	09 May 2016		

FIGURE 1.1

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SECTION 2 • WASTE ROCK MANAGEMENT

2.1 Lithologies

There are six major bedrock types (or lithologies) found at Whale Tail deposit: ultramafic, greywacke, chert, iron formation, mafic volcanic, and intermediate intrusive. Variable layers of overburden and lake sediment are present.

The ARD and ML potential of each waste rock lithology is currently being evaluated through an on-going static and kinetic testing program (Golder 2016). Details on the test methods used and results obtained are provided in Golder (2016) (FEIS Amendment Volume 5, Appendix 5-E, summarized in Appendix A). Anticipated ARD/ML potentials for each rock type based on exploration drill core tests are shown in Table 2.1.

Table 2.1 Anticipated ARD/ML Potential of Waste Rock Types at Whale Tail (Golder 2016)

Waste Type	Rock Unit Code	ARD Potential	ML Potential[1]
Ultramafic	V4a – 0a	No	High
Transitional Ultramafic	V4a – 0b	No	Moderate
Greywacke Central	S3C – 3b	Yes	Low
Greywacke South	S3S – 3b	No	Low
Chert	S10 – 3b	Yes	Low
Iron Formation	S9E – 3b	No	High
Mafic Volcanic	V3 – 1b	No	Low (variable)
Intermediate Intrusive	I2 – 8b	No	Low
Overburden	n.a.	No	Low[2]
Lake sediment	n.a.	Yes	High[2]

n.a. not applicable

[1] based on large column kinetic test results

[2] based on Shake Flask Extraction results

2.2 Waste Rock Segregation

Under the life of mine (LOM) Plan[1] approximately 51.7 Mt of waste rock and overburden will be generated from the Whale Tail Pit. Overburden will be placed in the Whale Tail Waste Rock Storage Facility (WRSF). Characterization of ARD/ML potential in the excavated waste rock is required in order to properly segregate it for use or disposal, as follows:

- **General Construction and/or Closure** – Only rock that has been certified as non-potentially acid generating (NPAG) and not leaching can be used for site construction, including dewatering dikes, and closure. It is the responsibility of the Geology Superintendent to ensure that all waste rock being used for construction or reserved for future use during closure has

[1] 6108_PJS-002_R3.xlsx (dated February22, 2016, Agnico Eagle pers. comm.).

been characterized and verified as being NPAG and not leaching. These rock types include the mafic volcanic and intermediate intrusive rock, and low sulphur (less than 0.1%) chert and greywacke.

- **Disposal** – All other waste rock, as well as overburden, will be placed within the Whale Tail WRSF for permanent storage.

2.2.1 Whale Tail Waste Rock Storage Facility Design

The majority of waste rock generated at the Whale Tail site will be placed in the Whale Tail WRSF. Under the current plan, the Whale Tail WRSF has an area of approximately 110 hectares.

The Whale Tail WRSF is designed to minimize the potential for ARD and ML. The Whale Tail WRSF will be constructed to encapsulate potentially acid generating (PAG) and ML waste rock inside a layer of NPAG material as a control measure for ARD and ML. The NPAG rock that is placed on the top and sides of the storage pile is needed in the long term to host the thawed layer and prevent liquids from contacting the centre of the pile that contains PAG and ML waste rock. Presently it is anticipated that 2 to 4 metres of capping is expected to maintain freezing conditions in the pile in the long-term. This rational is based on results to date on thermistor readings at the Portage waste rock pile, showing that this structure as well as perimeter structures (foundation and dikes) remain frozen on yearly basis. Rock oxidation can still occur in frozen material but will proceed at a slower rate than predicted by laboratory testing because of the cold temperature prevalent for much of the year. Permafrost will retain water as ice, so it was predicted that contaminants will not be transported away from the core of the WRSF in the long-term.

Monitoring will be conducted to measure temperatures throughout the waste rock pile, and to measure the depth of the annual surface thaw (see Section 4.2.2). This information will be used to confirm the thickness of rock cover required to close out the Whale Tail WRSF. Further details of the Whale Tail WRSF are provided in the Mine Waste Rock and Tailings Management Plan (Agnico Eagle 2016a).

SECTION 3 • ASSESSMENT OF ARD/ML POTENTIAL AT WHALE TAIL PIT

Sampling and testing of waste materials for ARD will be conducted during mine operation in order to segregate suitable waste for use in construction and for closure (Section 2.2) from that which will report directly to the Whale Tail WRSF. This section discusses field sampling methods, analytical testing, ARD/ML evaluation criteria, and the delineation of waste rock.

3.1 Field Sampling

No sampling is required where drill holes encounter the following waste rock types:

- Ultramafic (V4a-0a);
- Transitional Ultramafic (V4a-0b); or
- Iron Formation (S9E-3b), Chert (S10-3b).

These rock types will go directly to Whale Tail WRSF.

Where drill holes encounter greywacke (S3C/S3S-3b), mafic volcanic (V3-1b), and intermediate intrusive (I2-8b) units, field sampling of these units for use in ARD/ML evaluation will proceed according to the following guidelines that are currently utilized at Meadowbank Mine:

- To be sampled in accordance with the frequency set out in writing by the Geology Superintendent. The default sampling frequency is the sampling of every fourth drill hole in each drill hole pattern. The Geology Superintendent will vary this frequency based on his knowledge from previous drilling and from visual inspections depending on where the drill pattern is situated and which rock type is encountered. A reduced frequency of one sample every sixteenth drill hole in each drill hole pattern will be considered for specific rock types as described in Table 3.1.
- Each sample should be collected from drill cuttings and should weigh no less than 1 kilogram (kg).
- The samples will be labeled using a convention that is readily traceable back to the production drill hole numbers.
- Composite samples will not be used because they confuse the data and render it more difficult for use in model creation or comparison.

Samples of the greywacke (S3C/S3S-3b) will be analyzed for ARD potential (Section 3.2) following the default frequency (Table 3.1) as central greywacke (S3C) is considered to be PAG while the southern greywacke is NPAG (Table 2.1; Golder 2016 [FEIS Amendment Volume 5, Appendix 5-E]). Samples of mafic volcanic (V3-1b), which are considered to be NPAG, will be analyzed at the default frequency for ML potential (Section 3.3) as this unit exhibited potential to leach arsenic in samples proximal to the ultramafic (Golder 2016 [FEIS Amendment Volume 5, Appendix 5-E]). Samples of greywacke will not be subjected to ML evaluation because of their confirmed low leaching potential, while samples

of intermediate intrusive are NPAG and non leaching and are considered suitable for construction without further evaluation (Golder 2016 [FEIS Amendment Volume 5, Appendix 5-E]).

Table 3.2 Recommended Sampling Frequency by Rock Type

Waste Type	Rock Unit Code	Sampling Frequency	
		ARD Potential	ML Potential[1]
Ultramafic	V4a – 0a	No sampling – confirmed ARD/ML	
Transitional Ultramafic	V4a – 0b	No sampling – confirmed ARD/ML	
Greywacke Central	S3C – 3b	Every 4th dhole	Every 16th hole
Greywacke South	S3S – 3b	Every 4th hole	Every 16th hole
Chert	S10 – 3b	No sampling – confirmed ARD/ML	
Iron Formation	S9E – 3b	No sampling – confirmed ARD/ML	
Mafic Volcanic	V3 – 1b	Every 16th hole	Every 4th hole
Intermediate Intrusive	I2 – 8b	No sampling – confirmed NPAG / not leachable and suitable for construction	

3.2 Evaluation of ARD Potential at Whale Tail Pit

The most conventional method of characterizing the ARD potential of waste rock is to classify it as PAG, NPAG, or of uncertain acid generating potential (uncertain ARD potential) based on the net potential ratio (NPR) value. The NPR is the ratio of the acid-buffering potential (neutralization potential or NP) and the acid generation (maximum potential acidity or MPA; assumed to be due to sulphide sulphur content, or total sulphur minus sulphate sulphur).

This section discusses how, at the Whale Tail Pit, the NP and MPA will be measured, the NPR will be calculated, and the waste rock will be classified as PAG or NPAG.

3.2.1 Acid Base Accounting Testing

The ARD potential of waste rock is traditionally characterized through acid-base accounting (ABA) analyses. ABA analysis involves a suite of analytical tests that include paste pH, total sulphur, sulphate sulphur, neutralization potential, and carbonate neutralization potential based on total inorganic carbon.

Since ABA analyses are relatively slow to complete at a commercial laboratory and require several different types of equipment, the Meadowbank onsite assay lab was outfitted with the equipment required to analyze total sulphur and total inorganic carbon overnight. These values are then converted to MPA and carbonate NP, respectively, to classify Meadowbank material as PAG/NPAG (see Section 3.2.2).

This approach is consistent with the use of total sulphur and total inorganic carbon to calculate the MPA and NP of waste rock material for the Whale Tail Pit geochemical characterization study (Golder 2016 [FEIS Amendment Volume 5, Appendix 5-E]). Therefore, mine staff will apply the same approach

for Whale Tail Pit waste rock (Section 3.2.2). Samples of drill cuttings from the greywacke, mafic volcanic, and intermediate intrusive lithologies will be analyzed on-site for total sulphur and total inorganic carbon and the results from these analyses will be used to calculate the NPR value (from MEND 2009):

- Total sulphur is converted into **MPA** by multiplying the total sulphur wt% by 31.25, which yields an MPA value in kg $CaCO_3$ equivalent.
- Total inorganic carbon is similarly converted into a carbonate **NP** by multiplying the total wt% inorganic carbon (reported as $\%CO_2$) by 83.34 which yields an NP value in kg $CaCO_3$ equivalent. NP = [($\%CO_2$ x 100.09)/12.01]x10.
- The NPR for the blast hole drill cutting sample is then calculated as **NPR = NP/MPA**.

Samples from Whale Tail Pit will be subjected to the same quality assurance / quality control (QA/QC) program currently in use at Meadowbank, which includes the use of certified reference materials and duplicate analyses by an accredited external lab.

3.2.2 Evaluation of ARD Potential (PAG / NPAG)

The ARD potential of waste materials from the Meadowbank Mine are classified using the NPR-based guidelines published by Indian (now Indigenous) and Northern Affairs Canada (INAC, 1992), which are summarized in Table 3.1.

Table 3.3 ARD Guidelines used to Classify Whale Tail Pit Waste Rock and Overburden

Initial Screening Criteria (based on carbonate NP)	ARD Potential
NPR < 1	Likely acid generating (PAG)
1 ≤ NPR < 2	Uncertain or low acid generating potential
2 ≥ NPR	Non-potentially acid generating (NPAG)

However, the NPR guideline values used to differentiate between uncertain and NPAG were adjusted from 3 to 2 (Golder 2016 [FEIS Amendment Volume 5, Appendix 5-E]) using the criteria described in the INAC reference guide (knowledge of rock chemistry, mineralogy, reactivity of neutralizing minerals). For example, the use of carbonate NP as a surrogate for bulk NP was examined for Meadowbank waste (Golder 2016 [FEIS Amendment Volume 5, Appendix 5-E]) using data obtained from exploration drilling. For Portage and Vault the carbonate NP and bulk NP correlate reasonably well, implying that NPR calculated using carbonate NP is a safe assessment of available buffering capacity. This is consistent with observations in Whale Tail Pit waste rock (Golder 2016 [FEIS Amendment Volume 5, Appendix 5-E]) and thus the same NPR-based guidelines will be adopted to classify Whale Tail Pit waste rock and overburden for the Project.

Further, central greywacke rock can be considered PAG when it contains more than 0.1 wt% sulphur (Golder 2016 [FEIS Amendment Volume 5, Appendix 5-E]).

3.3 Metal Leaching Potential

Waste rock materials can also potentially leach metals when they come into contact with water and air, which is referred to as ML potential and can occur even if the materials are non-acid generating.

Mafic volcanic sample material will be subjected to testing to evaluate their ML potential.

3.3.1 Metal Leach Testing

Standard techniques for analysis of ML potential include Shake Flask Extraction (SFE) and humidity cell tests (HCT). Both of these tests involve exposing the samples to water, and measuring the metal content of the water after a prescribed period of contact time (24 hours for SFE tests and weekly 24 hour leaches over a minimum of 20 weeks for HCTs), and are thus time consuming by design.

Consequently, it is not feasible to segregate waste materials based on measured ML potentials derived from either of these types of leaching tests. The turn-around time for analytical results is too long for either of these tests to be used as a decision making tool on a day-to-day basis as required during mine operations. Further options for assessing the ML potential of Whale Tail Pit waste rock are discussed in Section 3.3.2.

3.3.2 Evaluation of Metal Leach Potential at Whale Tail Pit

Arsenic was identified as being leachable from some mafic volcanic samples that were marginal to the ultramafic rock (Table 2.1).

There is a weak correlation between total arsenic and sulphide sulphur in the mafic volcanic waste rock. Therefore, total sulphur cannot be used to evaluate its arsenic leaching potential.

The amount of arsenic released by leaching is generally proportional to the total arsenic content of the sample. There is a strong correlation between total and leachable arsenic in the mafic volcanic waste rock (R^2 >0.9). Further, samples with total arsenic content below approximately 100 ppm leached arsenic at concentrations below the Portage effluent criteria. This appears to be a suitable identifier of arsenic leaching. Total arsenic will be analyzed using either a portable XRF or at the Meadowbank on-site laboratory, and arsenic leaching potential be inferred based on the total arsenic content.

Further, ML potential and ML threshold values will be confirmed, consistent with the approach currently utilized for Meadowbank Mine, with quarterly analyses of SFE leachate at an external accredited laboratory.

A surface runoff water monitoring program will be implemented for the Project like it is at the other deposits of Meadowbank to detect ML in site contact waters (see Water Management Plan; Agnico Eagle 2016b). Further details on the water quality monitoring program are provided in Section 4.2.

3.4 Waste Rock Delineation

Following laboratory analysis, geology staff will classify greywacke waste rock as NPAG if the NPR value is equal or greater than 2 and PAG if the NPR value is less than 2 (Section 3.2). Greywacke waste rock classified as NPAG can be used for construction and closure while greywacke waste rock classified as PAG must be stored in the Whale Tail WRSF. These criteria can be re-evaluated when judged relevant by the Geology Superintendent in consultation with the mine engineer, as additional test data become available. ARD classifications of all samples will be logged in a database for the Project, and will be available as required for annual reports or upon request.

In some cases, it may be appropriate to calculate a weighted bulk average NPR for the whole block of rock and use the blended NPR to classify the greywacke rock. In such cases the Geology Superintendent will be consulted and the calculation of the weighted average NPR documented. In these cases the blended material will only be classified as being NPAG with the written approval of the Geology Superintendent.

NPR values will be transferred to the mine plans for that specific blast. Once blasting is complete the mine surveyor will use NPAG and PAG outlines from the drill pattern to outline the respective dig limits in the open pit. Different material categories are separated into packets, identified in the field using stakes, wire flags and flagging tape so that each packet can be excavated and sent to the appropriate destination (see Section 2.2). Packets classified as NPAG should include no more than one acid-generating sample (NPR<1) for every 8 non-acid generating samples (NPR≥2). Neither should they include more than one sample with low acid-generating potential (1≤NPR<2) for every 4 non-acid generating samples (NPR≥2).

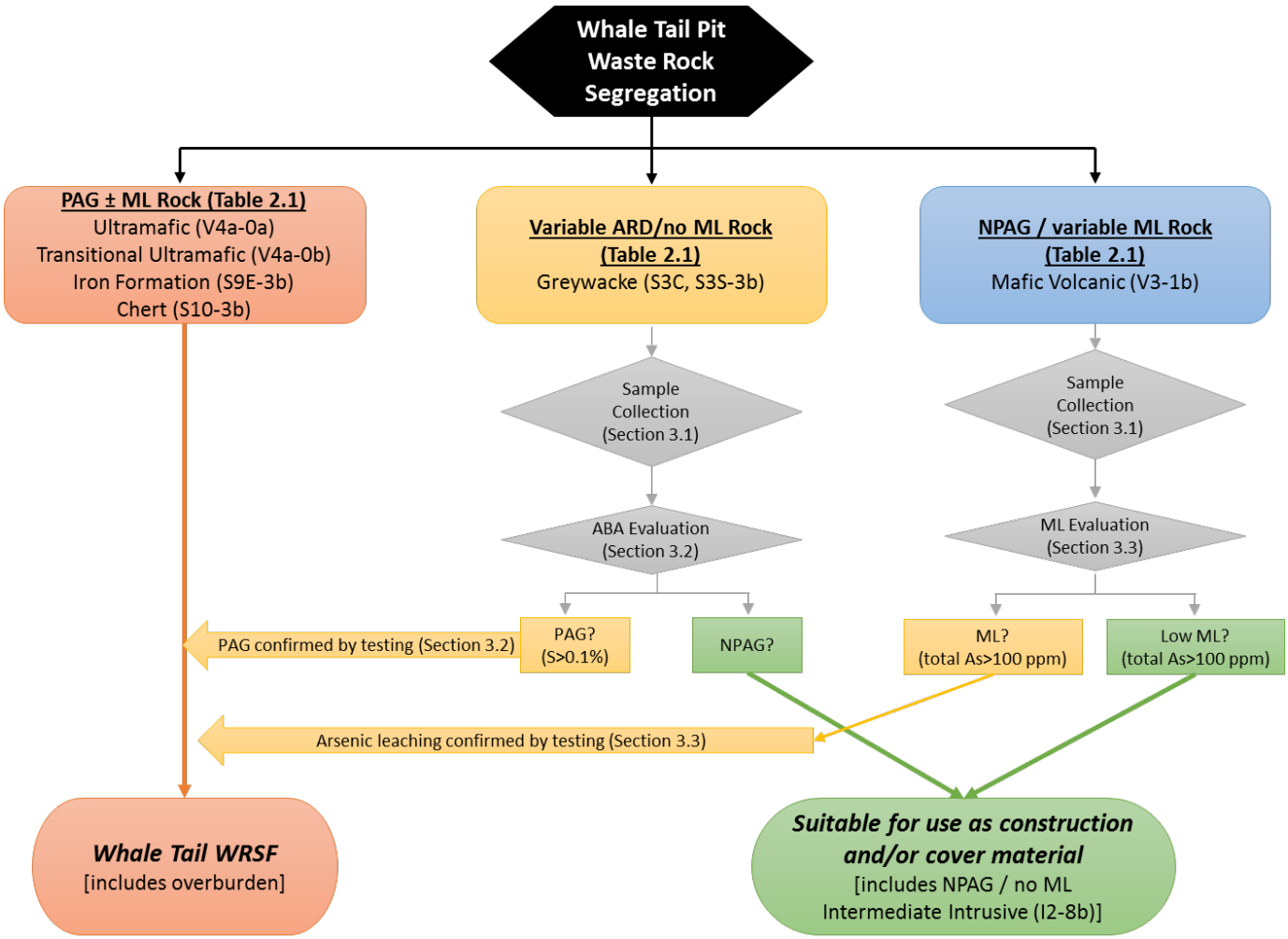

Figure 3.1 Flow Chart for Waste Rock Delineation and Segregation

SECTION 4 • PLAN REVIEW, PERFORMANCE MONITORING & REPORTING

4.1 Plan Review

The Mine Geology Superintendent will be responsible for implementing the Operational ARD-ML Sampling and Testing Plan. The overall Plan is to be reviewed as required by the Geology Superintendent and updated if necessary to reflect any adaptive changes made in the Operational ARD-ML Sampling and Testing Plan. The changes should be made in consultation with the mine engineer and chief assayer. Revised versions should be sent according to the Distribution List.

4.2 Performance Monitoring

The Operational ARD-ML Sampling and Testing Plan is the primary tool to ensure that all overburden and waste rock generated during the Project is appropriately characterized and managed to prevent the future release of contaminants from the Whale Tail WRSF into the receiving environment.

In addition to the analytical QA/QC procedures outlined in Section 3.0, performance monitoring activities will include those activities outlined below.

4.2.1 Water Quality Monitoring

Water quality will be sampled and monitored by the Agnico Eagle in accordance with the Type A Water Licence. The details of this monitoring program are described in the Water Management Plan (Agnico Eagle 2016b). Monitoring locations will include Whale Tail WRSF drainage, the Attenuation Pond, and dewatering dikes.

The data from this monitoring is to be provided to the NWB through annual reporting, as per the Type A Water Licence.

4.2.2 Permafrost Development

Thermistors will be installed within the Whale Tail WRSF to determine if permafrost formation is observed. More information regarding the thermal monitoring plan is provided in the Mine Waste Rock and Tailings Management Plan (Agnico Eagle 2016a). Thermal monitoring results are provided in Agnico Eagle's annual report submitted to the NWB.

SECTION 5 • REFERENCES

Agnico Eagle. 2016a. Mine Waste Rock and Tailings Management Plan. Volume 8, Appendix 8-A.1 of the Final Environmental Impact Statement and Type A Water Licence Amendments.

Agnico Eagle. 2016b. Water Management Plan. Volume 8, Appendix 8-B.2 of the Final Environmental Impact Statement and Type A Water Licence Amendments.

Golder (Golder Associates Ltd.). 2016. Evaluation of the Geochemical Properties of Waste Rock, Ore, Tailing, Overburden and Sediment from the Whale Tail Pit and Road Aggregate Materials, Agnico Eagle Mines, Meadowbank Division. Document No. 042. June 2016.

INAC (Indian and Northern Affairs Canada), 1992. Guidelines for ARD Prediction in the North – Northern Mine Environmental Neutral Drainage Studies No. 1. Department of Indian Affairs and Northern Development, Ottawa, 1993.

NWB (Nunavut Water Board). 2015. Water Licence #2AM MEA1525, Meadowbank Mine. 48p. July 2015

MEND (Mine Environment Neutral Drainage), 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials. MEND Report 1.20.1. Mining Environment Neutral Drainage Program, Natural Resources Canada. December 2009.

APPENDIX A • SUMMARY OF THE ARD/ML POTENTIAL OF WHALE TAIL MINE WASTES

The acid rock drainage (ARD) and metal leaching (ML) potential of waste material to be produced at Whale Tail Pit has been evaluated through both static and kinetic testing (Golder 2016). The static tests conducted for this purpose included the following:

- mineralogy;
- whole rock analysis;
- elemental solid phase analysis (multi-acid digestion);
- acid base accounting (ABA);
- net acid generation tests; and
- Shake Flask Extraction.

Test methods and results are provided in (Golder 2016).

Kinetic testing was conducted on representative samples of waste rock from each lithology using standard 1 kg humidity cell tests, and 26 to 60 kg composite column tests. Test methods are provided in (Golder 2016).

Table A.1 summarizes the ARD/ML potential for the overburden (till), lake sediments, and pit rock, based on the results of static and kinetic testing (Golder 2016). ARD potential was evaluated by comparing ABA results to the guidelines presented in INAC (1992). ML potential was evaluated based on exceedances of the Portage effluent limits (NWB 2015) in kinetic test leachate.

Table A.1 Summary of ARD/ML Potentials of Whale Tail Pit Waste Types

Waste Type	Unit	ARD Potential			Portage Effluent Limit Exceedances in Kinetic Test Leachate
		% PAG	% Uncertain	% NPAG	
Ultramafic	V4a – 0a	-	-	100	As, P
Transitional Ultramafic	V4a – 0b	8	-	92	As
Greywacke Central	S3C – 3b	63	14	23	Al, As
Greywacke South	S3S – 3b	-	-	100	As
Chert	S10 – 3b	100	-	-	Al, As
Iron Formation	S9E – 3b	27	9	64	Al, As, P
Mafic Volcanic	V3 – 1b	-	-	100	As
Intermediate Intrusive	I2 – 8b	-	20	80	Al
Overburden	n.a.	-	-	100	N/A
Lake sediment	n.a.	100	-	-	N/A

[1]Based on the results corresponding to the bulk column composite samples (Golder 2016).
PAG = potentially acid-generating; NPAG = not potentially acid-generating; n.a. = not applicable; N/A= not analyzed