MEADOWBANK
MINING CORPORATION

MEADOWBANK GOLD PROJECT

OPERATIONAL ARD/ML SAMPLING AND TESTING PLAN

AUGUST 2007

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SECTION 1 • INTRODUCTION

Meadowbank Mining Corporation (MMC), formerly Cumberland Resources Ltd. (Cumberland), is proposing to develop the Meadowbank Gold Project located approximately 70 km north of Baker Lake in Nunavut. The Project is subject to the environmental review and related licensing and permitting processes established by Part 5 of the Nunavut Land Claims Agreement (INAC and TFN, 1993).

On March 31, 2003, Cumberland submitted its Project Description Report for the Meadowbank Gold Project to the Nunavut Impact Review Board (NIRB). Following receipt of the MMC's application and NIRB's screening review the Minister of the Department of Indian Affairs referred the Project to an environmental impact review under Part 5 or 6 of Article 12 of the Nunavut Land Claims Agreement.

Following submission of a Final Environmental Impact Statement (FEIS), and completion of the screening and environmental impact review process, NIRB recommended that the Project proposal proceed subject to certain terms and conditions. On November 17, 2006, the Minister of Indian and Northern Affairs Canada, on behalf of the federal government and pursuant to Article 12.5.7 of the NLCA, approved the Nunavut Impact Review Board's recommendation and the Meadowbank Gold Mine Project Certificate (Nunavut Land Claims Agreement Article 12.5.12) was issued (NIRB, 2006).

The following document provides a plan for the sampling and testing of the waste materials to be generated as part of the mining process at the Meadowbank Gold Project. The purpose of this testing will be to characterize the acid rock drainage (ARD) and metal leaching (ML) potential of these materials. This characterisation will be used to develop an adaptive waste disposal plan such that waste with a significant ARD/ML potential will be disposed of in a manner that minimizes the likelihood for generating poor quality drainage. This information was identified by NIRB as requirement # 15 for Meadowbank's water license application (NIRB, 2006), as follows:

Cumberland shall within two (2) years of commencing operations re-evaluate the characterization of mine waste materials, including the Vault area, for acid generating potential, metal leaching and non metal constituents to confirm FEIS predictions, and re-evaluate rock disposal practices by conducting systematic sampling of the waste rock and tailing in order to incorporate preventive and control measures into the Waste Management Plan to enhance tailing management during operations and closure. The results of the re-evaluations shall be provided to the NWB and NIRB's Monitoring Officer.

This document provides a plan for systematic sampling of waste and recommends disposal practices that incorporate preventive measures to minimize generation of ARD and ML from the rock storage facilities (RSF).

SECTION 2 • BACKGROUND

The Meadowbank Gold Project consists of several gold-bearing deposits. The three main deposits are Vault, Portage (including Third Portage, North Portage, Bay Zone and Connector Zone), and Goose Island (see Figure 2-1). The Third Portage deposit, Bay Zone, Connector Zone, and North Portage deposit will be mined from a single pit termed the Portage Pit. The Goose Island deposit lies approximately 1 km to the south of the Third Portage deposit, beneath Third Portage Lake, and will be mined from a single pit termed the Goose Island Pit. The Vault deposit is located adjacent to Vault Lake, approximately 6 km north of the Portage deposits, and will be mined from a single pit termed the Vault Pit. Mining will be a truck and shovel open pit operation. A series of dikes will be required to isolate the mining activities from the lakes.

There are four major bedrock types found at Meadowbank: intermediate volcanic (IV), iron formation (IF), ultramafic (UM), and quartzite (QZ). Each of these rock types is present in both the Portage and Goose Island Pits. The Vault Pit, however, consists almost exclusively of IV. Table 2-1 summarizes the estimated quantity and proportion of each of these rock types that will be mined as waste during operation.

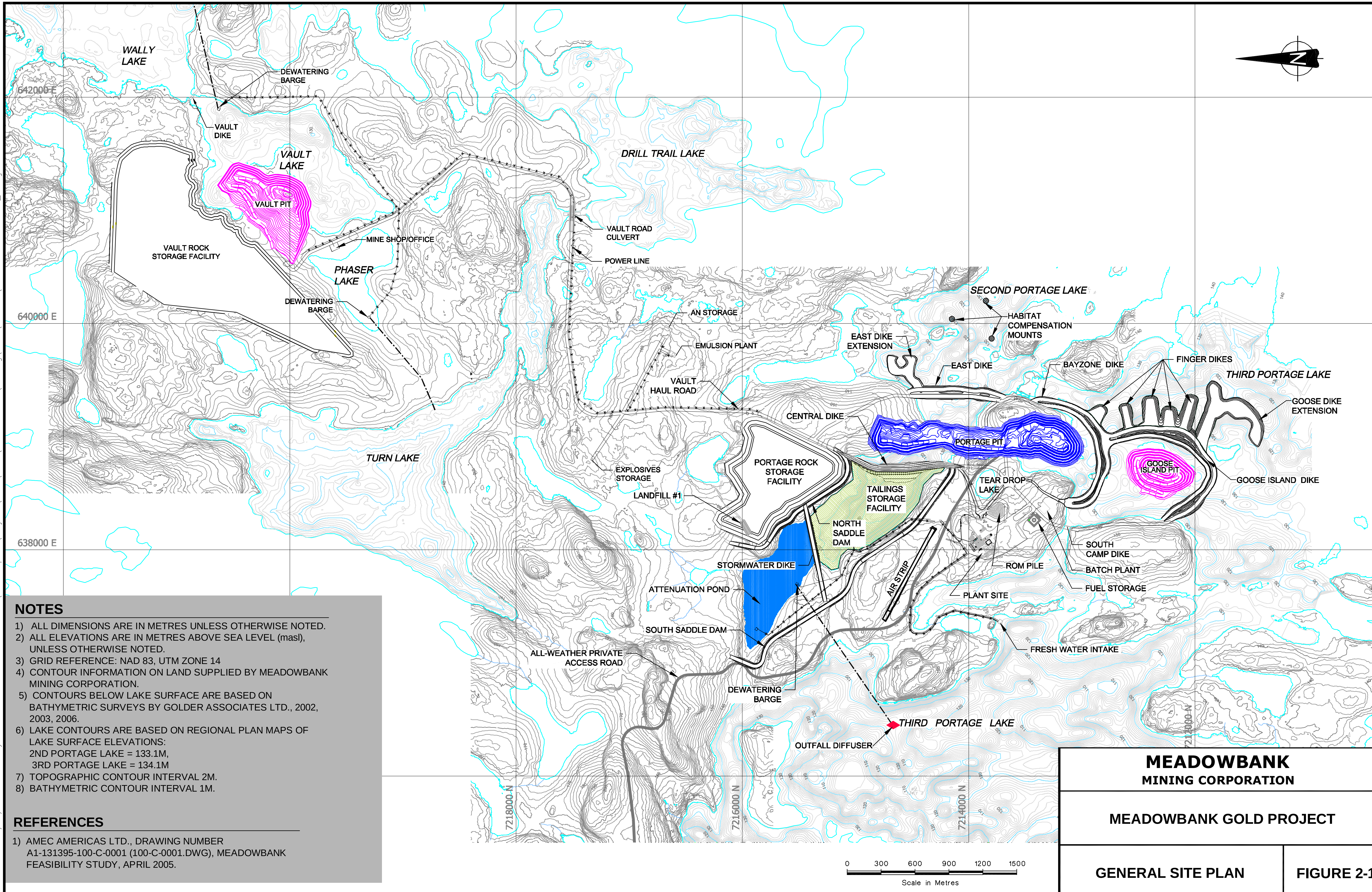
Table 2-1: Estimated Quantity and Proportion of Waste Rock Types

Rock Type	Estimated Quantity of Pit Rock Generated* (10^6 tonnes)			Lithological Distribution of Pit Rock (%)
	Goose/ Portage	Vault	Total	
IV	26	68	94	54
IF	34	0	34	20
UM	42	0	42	24
QZ	3	0	3	2
Total	**105**	**68**	**173**	**100**

- * Source: Schedule provided by AMEC (2005).

It is proposed that construction of the mine site infrastructure, including dikes, roads, foundations, and capping for reclamation purposes, will use waste rock and till[1] produced during mining. The composition of the till at Meadowbank ranges from silty sand to pebbles to boulders. Unused (i.e. surplus) quantities of waste rock and till from Portage and Goose Island will be placed in the Portage RSF, except for the Portage waste rock produced during years 3 through 5 of operation, which will be backfilled into the Portage Pit. Surplus material from Vault will be placed in the Vault RSF. Table 2-2 presents a summary of the estimated tonnage of each waste type to be used in construction or placed in a pit or RSF during mine life.

[1] It should be noted that the terms “till” and “overburden” have previously been used synonymously, however, the term “overburden” is currently considered to include both till and lake sediments.



NOTES

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (masl), UNLESS OTHERWISE NOTED.
3) GRID REFERENCE: NAD 83, UTM ZONE 14
4) CONTOUR INFORMATION ON LAND SUPPLIED BY MEADOWBANK MINING CORPORATION.
5) CONTOURS BELOW LAKE SURFACE ARE BASED ON BATHYMETRIC SURVEYS BY GOLDER ASSOCIATES LTD., 2002, 2003, 2006.
6) LAKE CONTOURS ARE BASED ON REGIONAL PLAN MAPS OF LAKE SURFACE ELEVATIONS:
   2ND PORTAGE LAKE = 133.1M,
   3RD PORTAGE LAKE = 134.1M
7) TOPOGRAPHIC CONTOUR INTERVAL 2M.
8) BATHYMETRIC CONTOUR INTERVAL 1M.

REFERENCES

1) AMEC AMERICAS LTD., DRAWING NUMBER A1-131395-100-C-0001 (100-C-0001.DWG), MEADOWBANK FEASIBILITY STUDY, APRIL 2005.

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GENERAL SITE PLAN	FIGURE 2-1

REVISION DATE: 07/08/23 10:50AM By: ASalvador CADD FILE: N:\Bur-Graphics\Projects\2006\1413\06-1413-089\Drafting\FINAL\Doc.425\061122386-5000-FIG_1.dwg

Table 2-2: Summary of Estimated Waste Destinations and Tonnages

Waste Destination	Waste Type[1] and Tonnage (10^6 tonnes)					Total
	Till	IV	IF	UM	QZ	
Dikes	1.8	5.7	8.1	3.7	0.2	**19.6**
Other Construction[2]	-	1.3	-	0.25	0.01	**1.5**
Capping	-	-	-	7.6	0.4	**8.0**
Aquatic Habitat Compensation	-	-	3.5	-	-	**3.5**
Portage RSF	7.3	14.9	14.8	23.9	1.9	**62.8**
Portage Pit	-	5.2	7.7	9.2	0.7	**22.8**
Vault RSF	-	68.2	-	-	-	**68.2**

- 1. It is assumed that the block model will be used to predict the rock type of material to be blasted.
- 2. Includes site roads, mill foundations, and the airstrip.

2.1 ARD/ML POTENTIALS AND CONTROL MEASURES

The ARD and ML potential of Meadowbank wastes have been evaluated through both static and kinetic testing. Details on the test methods used and results obtained are provided in (Golder, 2005a and 2005b), and summarized in Appendix A. Mine waste management options were developed for each rock type based on the results of this testing, as summarized in Table 2-3.

Table 2-3: Mine Waste Management Options Based on ARD/ML Potential

Open Pit	Waste Type	ARD Potential	ML Potential	Restrictions for Storage or Use in Construction
All Pits	Till	None	Low	None[1]
	Tailings	High	High	Requires measures to control ARD
	Lake Sediment	Variable (none to high)	High	May require collection and treatment of drainage
Portage & Goose	UM	None	Low	Drainage quality to be monitored
	IV	Variable (none to moderate)	Moderate	Requires measures to control ARD
	IF	High	High under ARD conditions - Low under buffered conditions	Requires measures to control ARD
	QZ	High	Low	Co-disposal with ultramafic/mafic volcanic or cap/water cover
Vault	IV	Low	Variable (low to moderate)	May require collection and treatment of drainage

- * Source: Cumberland, 2005.
- 1. Metal leaching potential of this waste type is expected to be short-term.

As shown in this table, the waste types that will report to the RSFs show variable ARD potentials, some of which will require control measures. To address this, it is proposed that each RSF is constructed as a cell, or series of cells, such that the interior of each cell is composed of any potentially acid generating (PAG) and/or metal leaching (ML) waste, and the exterior of each cell is composed of non-PAG (NPAG) waste, as shown conceptually on Figure 2-2. The limits of each cell will be defined by a low berm, prior to, or concurrent with, placing material within the cell. Thus, any PAG and/or ML waste within each RSF will be encapsulated within NPAG waste, thereby limiting its exposure to oxidizing agents such as air and water, and providing a buffer for any drainage from the interiors of the cells. Based on the results of thermal modelling, it is expected that the material within the RSFs will freeze within two years of placement (BGC, 2004).

As a further ARD control measure, the Portage RSF will be capped with acid-buffering UM rock at closure. Likewise, the tailings storage facility (TSF) will also be capped with UM rock. The Vault RSF is not expected to require capping, as the bulk of the material from this deposit is NPAG (only 11% of the Vault samples tested were found to be PAG; Golder, 2005a). The UM rock to be used for capping the Portage RSF and TSF will likely need to be stockpiled, as it is not expected that this rock type will be mined in any significant quantity at the end of mine life.

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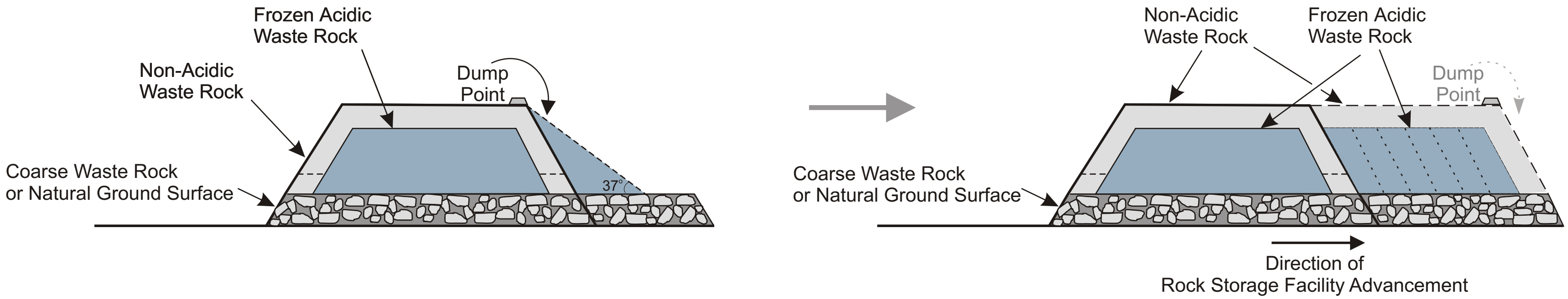
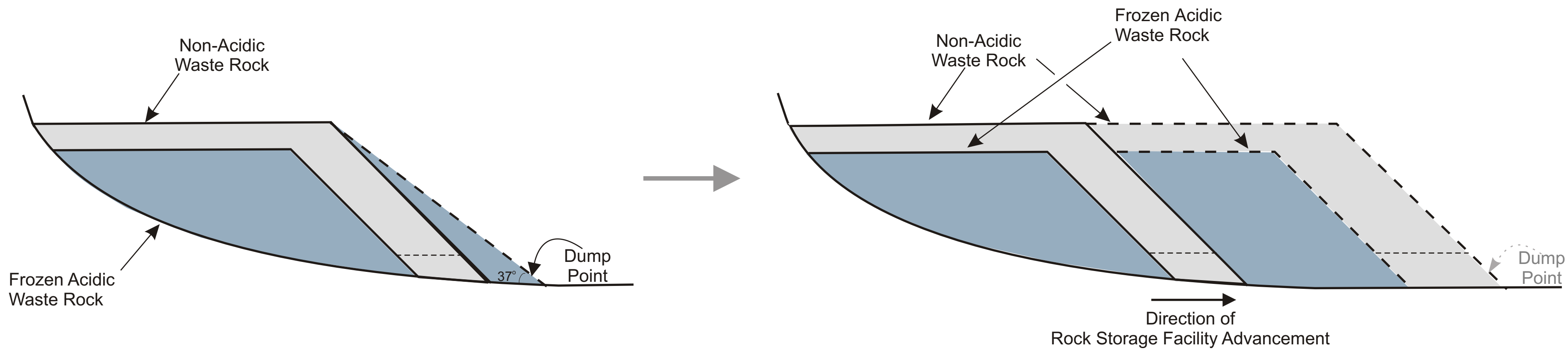
HEAPED CONSTRUCTION



END-DUMPED CONSTRUCTION



Not to Scale

REFERENCES

1) MEND 1.61.2, 1996

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WASTE ROCK STORAGE FACILITY CONSTRUCTION METHODS

FIGURE 2-2

2.2 WATER QUALITY PREDICTIONS

The results of the static and kinetic tests conducted on Meadowbank waste materials were also used to predict the water quality from major mine site components. These predictions were developed using the GoldSim simulation package, with modules designed specifically for Meadowbank. Details on the model assumptions and methods are provided in (Golder, 2005c).

The water quality predictions indicate that arsenic, copper, nickel, zinc, nitrate and ammonia may be found in the Portage RSF drainage. This drainage will ultimately end up in an attenuation/reclaim pond, and would be treated if required. Arsenic may also be found in the Vault RSF drainage, although water from this area is not expected to require treatment.

SECTION 3 • SAMPLING AND TESTING PLAN

Sampling and testing of waste materials produced at Meadowbank will be required during operation in order to segregate the PAG and/or ML waste from the NPAG waste, such that waste materials can be assigned to specific locations. Sampled materials should be inclusive of stripped overburden, drill core or pit walls, and blasthole cuttings. It is not proposed that stripped lake sediments will be sampled, as the total excavated volume of these materials is expected to be relatively low (*i.e.*, less than approximately 1,180,000 cubic metres; Golder, 2006a). Nonetheless, as some lake sediment samples have a demonstrated potential to generate ARD, they will be managed in the same fashion as PAG waste material.

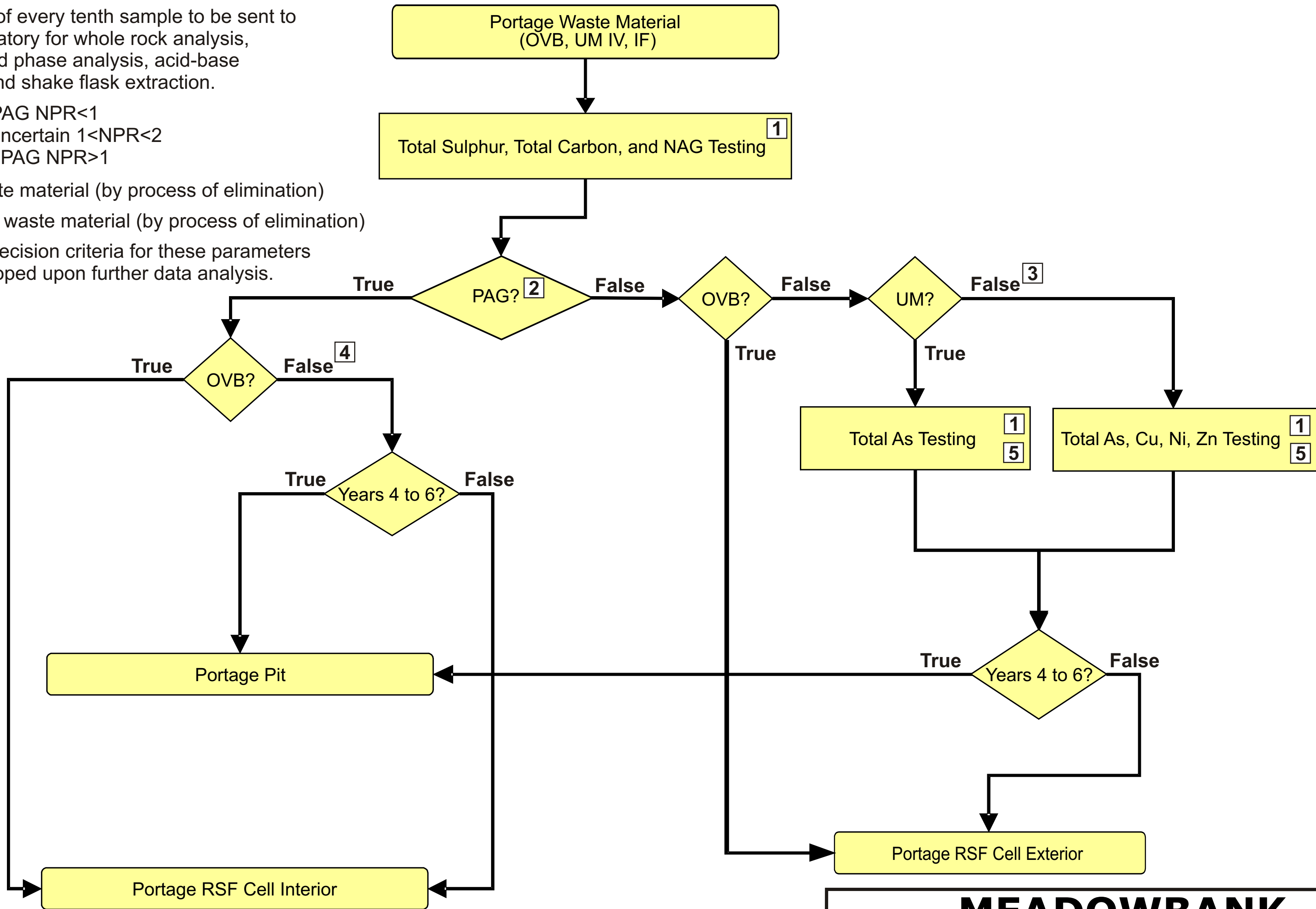
In consideration of the mining rate, test procedures should be rapid and easy to complete. The proposed tests are described in the following subsections and summarized in Figures 3-1 to 3-3. It is anticipated that these tests will be conducted at the assay lab to be constructed on site, which is expected to be running prior to production (MMC, 2007a). Any wastes that are produced prior to the completion of the assay lab will require testing at an external laboratory.

3.1 TOTAL SULPHUR, TOTAL CARBON, AND NET ACID GENERATION (NAG) TESTS AS INDICATORS OF ARD POTENTIAL

3.1.1 Total Sulphur and Total Carbon

The ARD potentials of previously collected samples from Meadowbank were evaluated based on acid-base accounting (ABA), which is a suite of tests that includes paste pH, total sulphur, sulphate sulphur, neutralization potential, and carbonate neutralization potential based on total inorganic carbon. As the name suggests, ABA accounts for both acid generation potential (assumed to be due to sulphide sulphur content, or total sulphur minus sulphate sulphur) as well as acid-buffering potential (referred to as neutralization potential). However, ABA is relatively slow to complete (the average turn-around time at a commercial laboratory is approximately 2 weeks), and requires several different types of equipment and analyses. It is therefore proposed that the ARD potentials of all samples of waste material collected during operation be estimated based on total sulphur and total

1. A subsample of every tenth sample to be sent to external laboratory for whole rock analysis, elemental solid phase analysis, acid-base accounting, and shake flask extraction.
2. INAC, 1992: PAG NPR<1
   Uncertain 1<NPR<2
   NPAG NPR>1
3. IV and IF waste material (by process of elimination)
4. UM, IV and IF waste material (by process of elimination)
5. Site-specific decision criteria for these parameters may be developed upon further data analysis.



OVB - Overburden
UM - Ultramafic
IF - Iron Formation
IV - Intermediate Volcanic
NAG - Net Acid Generation
PAG - Potentially Acid Generating
NPAG - Not Potentially Acid Generating

As - Arsenic
Cu - Copper
Ni - Nickel
Zn - Zinc
RSF - Rock Storage Facility

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PORTAGE WASTE TESTING LOGIC DIAGRAM

FIGURE 3-1

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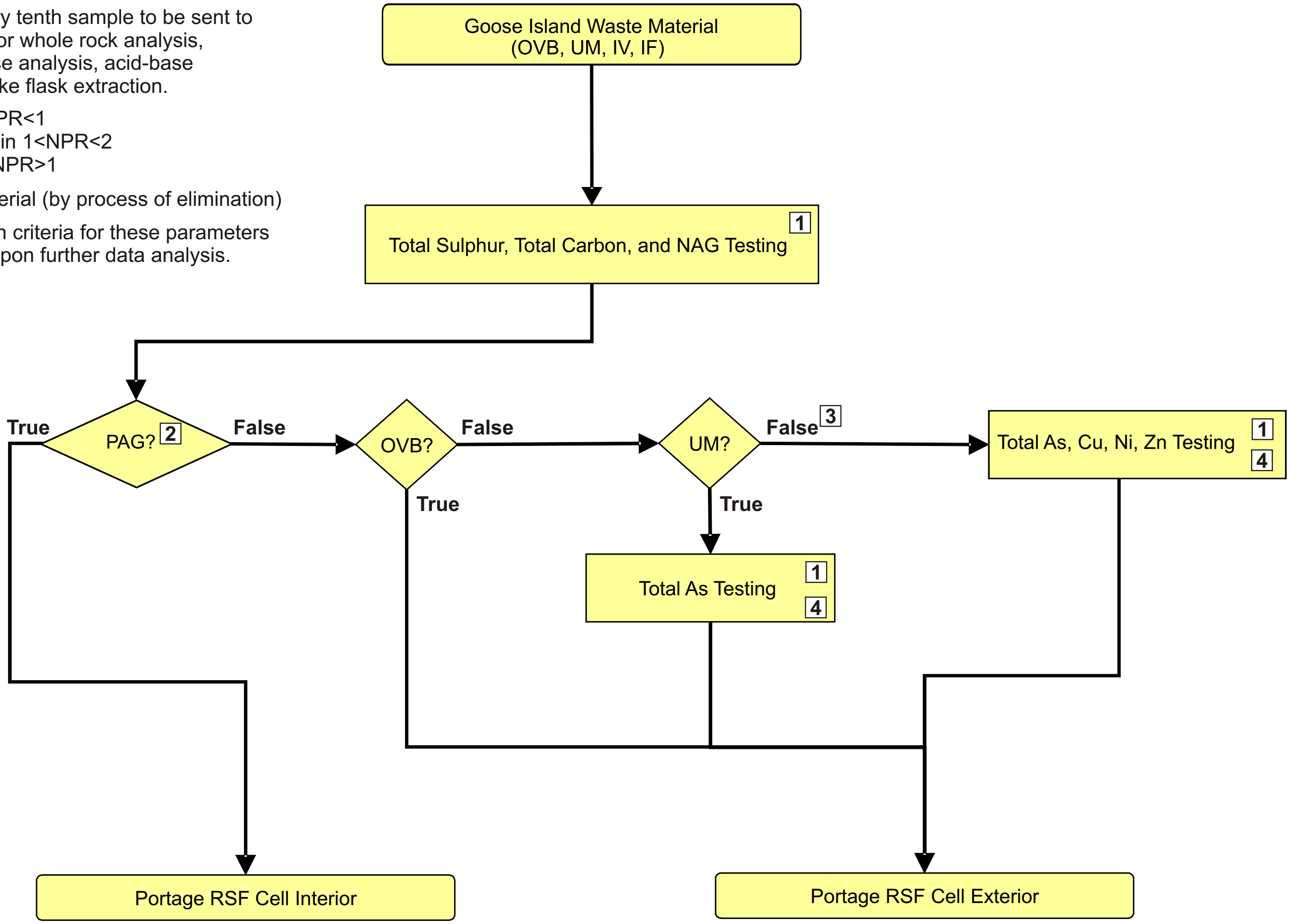
1. A subsample of every tenth sample to be sent to external laboratory for whole rock analysis, elemental solid phase analysis, acid-base accounting, and shake flask extraction.
2. INAC, 1992: PAG NPR<1
   Uncertain 1<NPR<2
   NPAG NPR>1
3. IV and IF waste material (by process of elimination)
4. Site-specific decision criteria for these parameters may be developed upon further data analysis.



OVB - Overburden
UM - Ultramafic
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RSF - Rock Storage Facility

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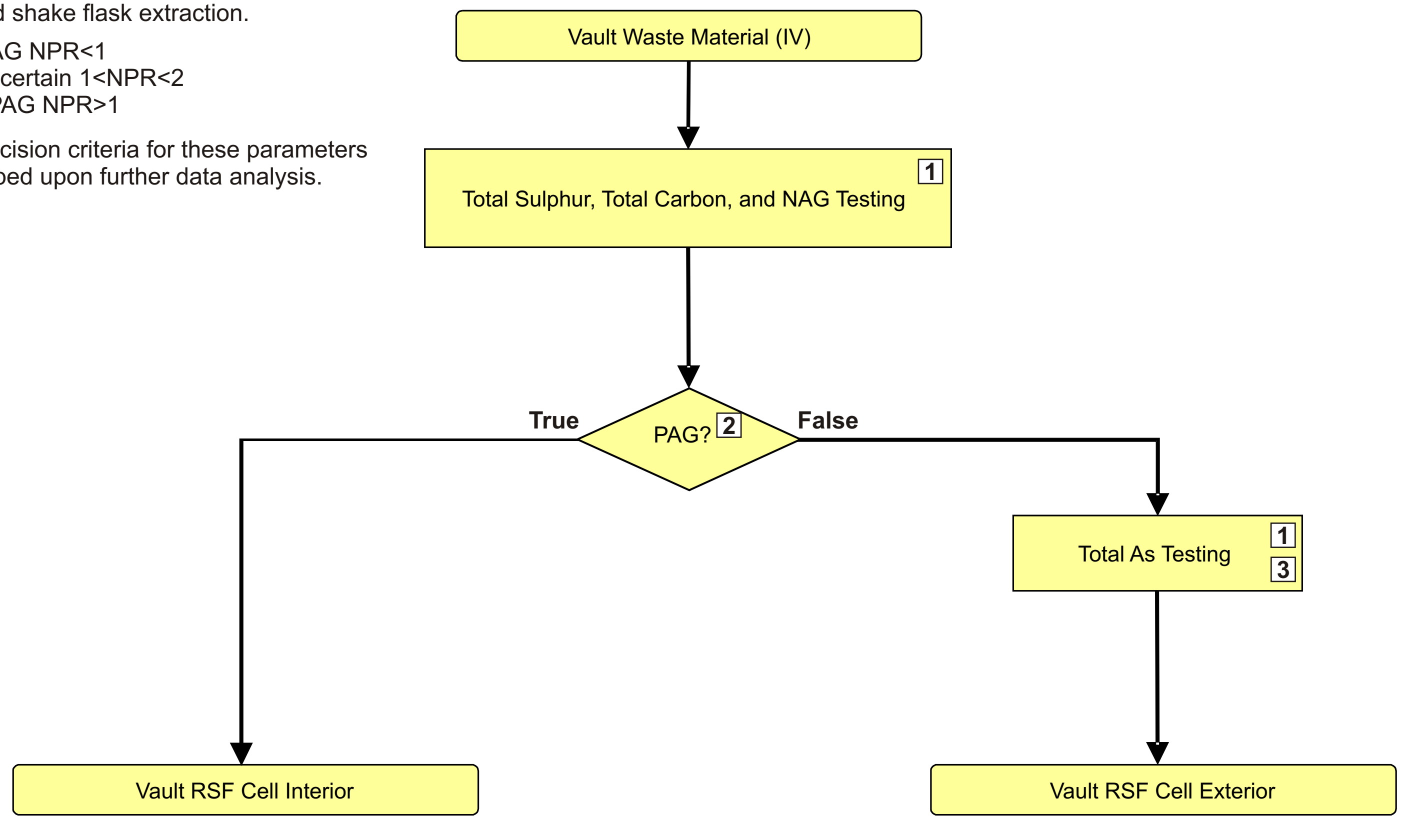
GOOSE ISLAND WASTE TESTING LOGIC DIAGRAM

FIGURE 3-2

1. A subsample of every tenth sample to be sent to external laboratory for whole rock analysis, elemental solid phase analysis, acid-base accounting, and shake flask extraction.
2. INAC, 1992: PAG NPR<1
   Uncertain 1<NPR<2
   NPAG NPR>1
3. Site-specific decision criteria for these parameters may be developed upon further data analysis.



NAG - Net Acid Generation
PAG - Potentially Acid Generating
NPAG - Not Potentially Acid Generating
RSF - Rock Storage Facility
As - Arsenic

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VAULT WASTE ROCK TESTING LOGIC DIAGRAM

FIGURE 3-3

carbon[2] (to provide an estimate of carbonate neutralization potential), with periodic duplicate checks based on ABA conducted at an external laboratory. It is recommended that these tests be conducted using a LECO furnace (LECO Corporation, St. Joseph, MI, USA) which can analyze both sulphur and carbon content.

3.1.2 NAG Tests

Another type of test commonly used at mine sites, particularly in the Pacific Basin, to characterize ARD potential is the net acid generation (NAG) test (Miller et al, 1997). This test involves crushing and pulverizing a given sample to <75 microns to enhance the availability of minerals, and adding a known volume of hydrogen peroxide (pH 4 – 7) which rapidly oxidizes any sulphide minerals it contains. This reaction is allowed to progress until all of the sulphide minerals within the sample are exhausted, which typically takes a minimum of 2 hours and may require heating. After the reaction has completed, the pH (NAG pH) of the sample is measured. The solution can then be titrated to a specified pH endpoint using sodium hydroxide, to assess acid forming potential in units of kg CaCO3/tonne equivalent (same units as neutralization potential (NP) and acid potential (AP) obtained from ABA). The results of these tests are achievable in a relatively short period of time, which makes them useful for evaluating the ARD potential of materials on site. It is therefore proposed that the NAG tests be conducted on all samples of waste submitted to the assay lab, and compared to the results of both the total sulphur and total carbon tests conducted on site, as well as the results of ABA conducted at an external laboratory, to determine whether the NAG test may be a more useful or accurate indicator of ARD potential.

3.1.3 Decision Criteria

The most conventional method of evaluating the ARD potential of a material using ABA data is to classify it as PAG, NPAG, or of uncertain ARD potential based on its neutralization potential ratio (NPR). The NPR of a material is calculated as the ratio of its NP to its AP. The ARD potentials of materials collected from Meadowbank were classified using the NPR-based guidelines published by Indian and Northern Affairs Canada (INAC, 1992), which are summarized in Table 3-2.

Table 3-1: Summary of ARD Guidelines Used to Classify Meadowbank Waste (INAC, 1992)

Initial Screening Criteria	ARD Potential
NPR < 1	Likely Acid Generating (PAG)
1 < NPR < 2	Uncertain
2 < NPR	Acid Consuming Not Potentially Acid Generating (NPAG)

Knowledge of rock chemistry, mineralogy and reactivity of neutralizing minerals support the use of an NPR of 2 to designate rock that is NPAG (Golder, 2006b). Figure 3-4 presents a graph of carbonate

[2] It is not expected that the wastes produced at Meadowbank will contain organic carbon in any appreciable amount.

NP versus bulk NP data obtained to date for waste rock samples from Meadowbank. As shown on this graph, carbonate NP and bulk NP correlate relatively well for these samples, which suggests that NPR values calculated using carbonate NP would be comparable to NPR values calculated using bulk NP. It is therefore initially proposed that the waste samples submitted to the assay lab be classified according to the previously used guidelines (i.e. Table 3-2), using NPR values calculated from the total sulphur and total carbon contents provided by the assay lab. Any samples that are classified as having an “uncertain” ARD potential using these guidelines will be considered PAG for the purpose of material placement. These criteria will be re-evaluated on a bi-annual basis, as additional ABA, total sulphur, total carbon, and NAG test data become available. Should the NAG test be found to be a more useful or accurate indicator of ARD potential in the future, it may be used to classify waste materials according to ARD potential on site instead.

3.2 TOTAL METALS AS INDICATORS OF METAL LEACHING POTENTIAL

The ML potentials of previously collected waste rock samples were evaluated based on shake flask extraction (SFE) tests and humidity cell tests. Both of these types of tests involve leaching samples with water, followed by measuring the metal content of the water after a prescribed period of contact time (24 hours for SFE tests and weekly 24 hour trickle leaches over a minimum of 20 weeks for humidity cell tests), and are thus time-consuming by design. Consequently, it will not be feasible to segregate waste materials based on ML potentials derived from either of these types of leaching tests. It is therefore proposed that total concentrations of individual metals found in rock leachate be tested at the assay lab on site, and that periodic SFE tests be conducted on duplicate samples at an external laboratory, in order to assess whether correlations between total and leachable metals can be made[3]. If such correlations can be established, criteria that classify the ML potential of materials based on total concentrations of individual metals found in rock leachate will also be established. It is also proposed that the drainage from the RSFs and UM stockpile be monitored for metals found in rock leachate.

[3] It has not been possible to make such correlations based on the data obtained to date.

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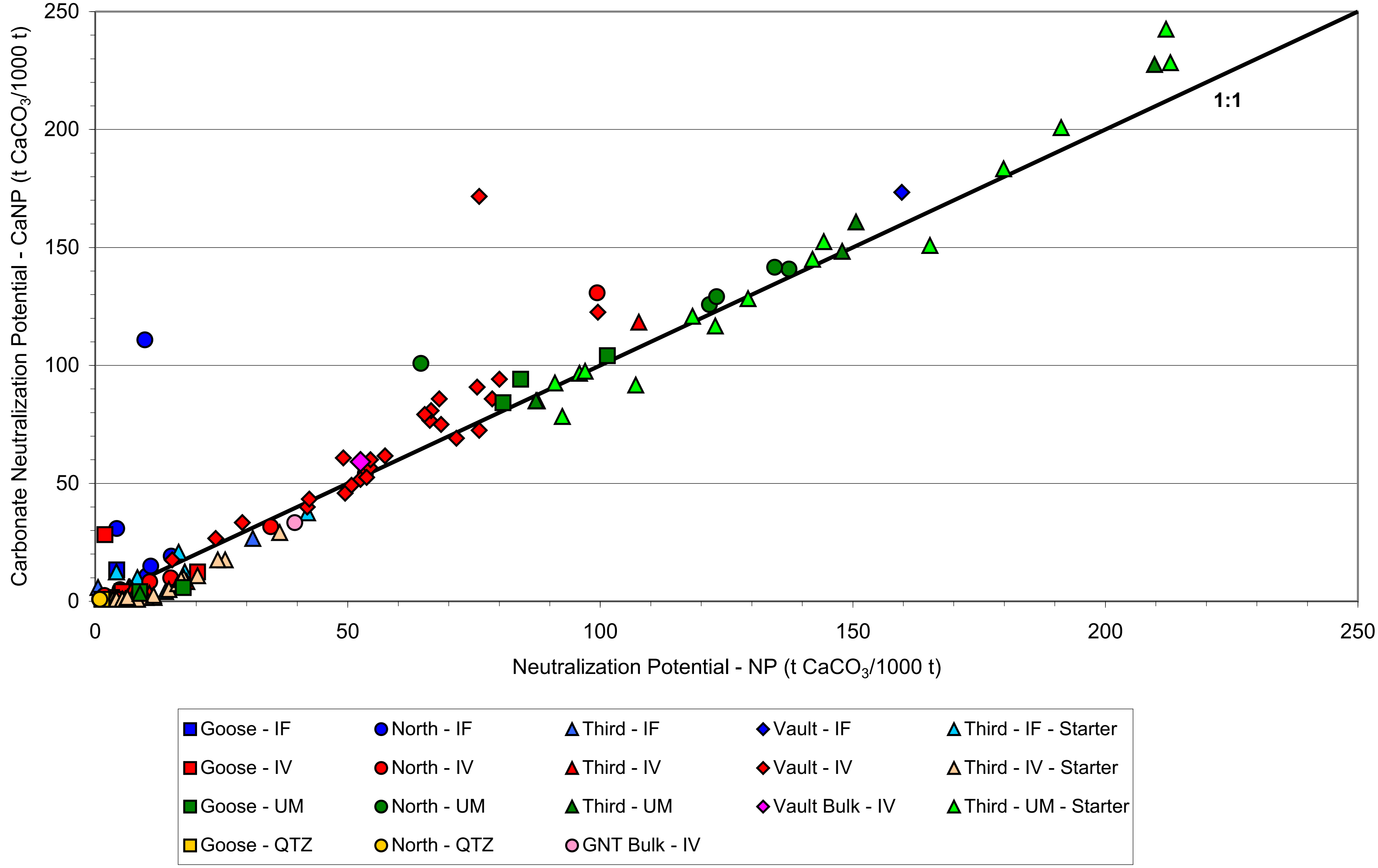

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PIT ROCK TOTAL NEUTRALIZATION POTENTIAL VERSUS CARBONATE POTENTIAL (NP vs CaNP)

FIGURE 3-4

Based on the results of the static and kinetic testing and water quality modelling performed to date, it is proposed that IF and Portage/Goose IV samples that have been classified as NPAG be tested for total arsenic, copper, nickel and zinc, and that UM and Vault IV samples that have been classified as NPAG only be tested for total arsenic. Total metal tests have not been proposed for samples that have been classified as PAG, as the material represented by such samples will be encapsulated regardless of any ML potential. The total metal tests to be conducted in the site assay lab could be performed using x-ray diffraction (XRF), or multi-acid digestion followed by ICP scans. The mineralogy of all NPAG rock samples will also be described, recorded, and compared with the results of the total metal and SFE tests.

3.3 QA/QC

The assay lab on site will be certified for all analyses, and standard analytical QA/QC procedures will be followed to ensure quality of results. As part of the certification process, and as a cross-check for the total sulphur, total carbon, NAG, and total metal tests to be conducted on site, it is proposed that duplicate samples of the material sent to the assay lab periodically be sent to an external laboratory for ABA and SFE testing, as well as elemental solid phase and whole rock analyses. Depending on how the results of these tests correlate with the results of total sulphur, total carbon, NAG, and total metal tests conducted on site, the decision criteria used to segregate the waste materials produced on site may be adjusted.

SECTION 4 • PREDICTED ARD/ML POTENTIAL OF STORED WASTE

As stated in section 2.0, excess waste material not used in construction will either report to an RSF or to the Portage pit for final disposal. Table 4-1 presents the volumes of waste rock and till that are expected to be used for various construction purposes, placed within an RSF, or placed into the Portage pit by operation year, based on the mine schedule prepared by AMEC (2005), modified such that approximately 8,500 tonnes of ore are processed per day. As shown on this table, it is expected that there will be an excess of UM rock available for capping the TSF and Portage RSF, and for the constructing the exteriors of Portage RSF cells, although the timing of its availability is such that the UM rock will need to be stored for use at end of mine life.

TABLE 4-1 : MEADOWBANK GOLD PROJECT
MATERIALS BALANCE

	Estimate of Material Quantities by Year (tonnes)										
	-2	-1	1	2	3	4	5	6	7	8	
TILL											
East Dike	123,758	-	-	-	-	-	-	-	-	-	123,758
Bay Zone Dike	-	234,682	-	-	-	-	-	-	-	-	234,682
Central Dike	-	382,911	-	-	-	-	-	-	-	-	382,911
Stormwater Dike	-	-	-	-	89,737	-	-	-	-	-	89,737
Goose Island Dike	-	-	765,945	-	-	-	-	-	-	-	765,945
Vault Dike	-	-	-	-	12,540	-	-	-	-	-	12,540
South Saddle Dam	-	-	-	-	222,224	-	-	-	-	-	222,224
Total Volume Required for Dike	123,758	617,593	765,945	-	324,501	-	-	-	-	-	1,831,798
Road to ANFO Storage	-	-	-	-	-	-	-	-	-	-	-
Plant Roads	-	-	-	-	-	-	-	-	-	-	-
Vault Haul Road	-	-	-	-	-	-	-	-	-	-	-
Airstrip	-	-	-	-	-	-	-	-	-	-	-
Mill Foundations	-	-	-	-	-	-	-	-	-	-	-
Total Volume Required for Construction	-	-	-	-	-	-	-	-	-	-	-
TOTAL TILL REQUIRED	123,758	617,593	765,945	0	324,501	0	0	0	0	0	1,831,798
TOTAL TILL AVAILABLE	623,900	1,215,400	2,070,500	3,045,100	756,631	1,431,173	21,328	0	0	0	9,164,032
SURPLUS (DEFICIT)	500,142	597,807	1,304,555	3,045,100	432,130	1,431,173	21,328	0	0	0	7,332,235
Portage SURPLUS	500,142	597,807	1,304,555	0	432,130	1,431,173	21,328	0	0	0	4,287,135
Goose SURPLUS	0	0	0	3,045,100	0	0	0	0	0	0	3,045,100
Vault Pit SURPLUS	0	0	0	0	0	0	0	0	0	0	0
IV											
East Dike (Construction)	190,631	-	-	-	-	-	-	-	-	-	190,631
Bay Zone Dike (Construction)	-	406,465	-	-	-	-	-	-	-	-	406,465
Central Dike (Construction)	-	405,808	-	1,450,891	-	-	28,819	-	-	-	1,885,518
North Saddle Dam (Construction)	-	-	485,812	485,812	-	-	-	-	-	-	971,624
South Saddle Dam (Coarse Filter)	-	-	-	-	68,752	-	-	-	-	-	68,752
South Saddle Dam (Fine Filter)	-	-	-	-	43,178	-	-	-	-	-	43,178
Stormwater Dike (Coarse Filter)	-	-	-	-	22,173	-	-	-	-	-	22,173
Goose Island Dike (Construction)	-	-	835,690	-	-	-	-	-	-	-	835,690
Vault Dike (Construction)	-	-	-	-	23,522	-	-	-	-	-	23,522
Finger Dikes (Construction)	-	-	-	-	-	-	-	-	-	-	-
Total Volume Required for Dikes	190,631	812,273	1,321,502	1,936,703	157,624	-	28,819	-	-	-	4,447,552
Road to ANFO Storage	142,500	-	-	-	-	-	-	-	-	-	142,500
Plant Roads	-	197,472	-	-	-	-	-	-	-	-	197,472
Vault Haul Road	-	-	-	677,255	-	-	-	-	-	-	677,255
Airstrip	-	35,530	-	-	-	-	-	-	-	-	35,530
Mill Foundations	114,000	114,000	-	-	-	-	-	-	-	-	228,000
Total Volume Required for Construction	256,500	347,002	-	677,255	-	-	-	-	-	-	1,280,757
											-
TOTAL IV REQUIRED	447,131	1,159,274	1,321,502	2,613,958	157,624	0	28,819	0	0	0	5,728,309
TOTAL IV AVAILABLE	455,590	745,244	6,911,279	8,169,700	5,170,235	3,019,146	955,588	0	0	0	25,426,782
SURPLUS (DEFICIT)	8,459	(-414,030)	5,589,777	5,555,742	5,012,611	3,019,146	926,768	0	0	0	19,698,473
Portage SURPLUS	8,459	(-414,030)	5,589,777	(-157,483)	1,800,506	2,453,951	926,768	0	0	0	10,207,948
Goose SURPLUS	0	0	0	5,713,224	3,212,105	565,195	0	0	0	0	9,490,525
Vault Pit SURPLUS	0	0	0	0	0	5,210,542	25,892,381	21,958,293	14,397,119	748,483	68,206,819
IF											0
East Dike (Construction)	323,090	-	-	-	-	-	-	-	-	-	323,090
East Dike Extension	89,637	378,506	137,034	-	-	-	-	-	-	-	605,176
Finger Dike Extension	-	-	-	568,966	1,137,932	568,966	568,966	-	-	-	2,844,831
HC Mounts (M1, M2, M3, M4, M5, M6)	-	-	-	-	-	-	75,200	-	-	-	75,200
Bay Zone Dike (Construction)	-	588,777	-	-	-	-	-	-	-	-	588,777
Central Dike (Construction)	-	-	-	-	-	-	-	-	-	-	-
Stormwater Dike (Construction)	-	609,950	-	-	-	-	-	-	-	-	609,950
Goose Island Dike (Construction)	-	-	1,950,375	-	-	-	-	-	-	-	1,950,375
Vault Dike (Construction)	-	-	-	-	-	-	-	-	-	-	-
Finger Dikes (Construction)	-	-	-	924,755	1,849,511	1,740,955	108,555	-	-	-	4,623,777
Total Volume Required for Dike	412,727	1,577,233	2,087,408	1,493,722	2,987,443	2,309,922	752,722	-	-	-	11,621,176
Road	-	-	-	-	-	-	-	-	-	-	-
Plant Roads	-	-	-	-	-	-	-	-	-	-	-
Vault Haul Road	-	-	-	-	-	-	-	-	-	-	-
Airstrip	-	-	-	-	-	-	-	-	-	-	-
Mill Foundations	-	-	-	-	-	-	-	-	-	-	-
Total Volume Required for Construction	-	-	-	-	-	-	-	-	-	-	-
											-
TOTAL IRON FM. REQUIRED	412,727	1,577,233	2,087,408	1,493,722	2,987,443	2,309,922	752,722	0	0	0	11,621,176
TOTAL IRON FM. AVAILABLE	412,727	1,577,232	11,696,997	4,346,858	5,605,734	8,221,066	2,264,706	0	0	0	34,125,320
SURPLUS (DEFICIT)	0	(-1)	9,609,588	2,853,136	2,618,291	5,911,145	1,511,984	0	0	0	22,504,144
Portage SURPLUS	0	(-1)	9,609,588	1,214,392	1,038,978	5,172,273	1,511,984	0	0	0	18,547,215
Goose SURPLUS	0	0	0	1,638,744	1,579,313	738,872	0	0	0	0	3,956,928
Vault Pit SURPLUS	0	0	0	0	0	0	0	0	0	0	0
UM+QZ											
East Dike (Surfacing)	182,958	182,958	-	-	-	-	-	-	-	-	365,915
Bay Zone Dike (Surfacing)	-	-	475,295	-	-	-	-	-	-	-	475,295
Bay Zone Dike (Construction)	-	-	-	-	-	-	-	-	-	-	-
Cental Dike (Surfacing)	-	97,592	-	444,222	-	-	604,992	-	-	-	1,146,806
Cental Dike (Construction)	-	-	-	-	-	-	-	-	-	-	-
South Saddle Dam	-	-	-	-	1,026,350	-	-	-	-	-	1,026,350
Goose Island Dike (Surfacing)	-	-	-	519,477	-	-	-	-	-	-	519,477
Vault Dike (Surfacing)	-	-	-	-	12,844	-	-	-	-	-	12,844
Finger Dikes (Surfacing)	-	-	-	74,480	148,960	74,480	74,480	-	-	-	372,400
Total Volume Required for Dikes	182,958	280,549	475,295	1,038,179	1,188,154	74,480	679,472	-	-	-	3,919,086
Stockpiling Capping Material for Portage Dump	-	-	-	1,254,000	1,254,000	-	-	-	-	-	2,508,000
Stockpiling Capping Material for Vault Dump	-	-	-	-	-	-	-	-	-	-	-
Stockpiling Capping Material for Tailings Pond	-	-	-	2,755,000	2,755,000	-	-	-	-	-	5,510,000
Total Capping Volume Required	-	-	-	4,009,000	4,009,000	-	-	-	-	-	8,018,000
Road to ANFO Storage (Capping)	-	48,163	-	-	-	-	-	-	-	-	48,163
Plant Roads (Capping)	-	65,824	-	-	-	-	-	-	-	-	65,824
Vault Haul Road (Capping)	-	-	-	68,400	-	-	-	-	-	-	68,400
Airstrip	-	-	-	-	-	-	-	-	-	-	-
Mill Foundations	38,000	38,000	-	-	-	-	-	-	-	-	76,000
Total Volume Required for Construction	38,000	151,987	-	68,400	-	-	-	-	-	-	258,387
TOTAL UM+QZ REQUIRED	220,958	432,537	475,295	5,115,579	5,197,154	74,480	679,472	0	0	0	12,195,474
TOTAL UM+QZ AVAILABLE	234,251	531,253	7,372,205	16,419,453	12,980,378	6,270,443	1,560,475	0	0	0	45,368,459
SURPLUS (DEFICIT)	13,294	98,717	6,896,910	11,303,874	7,783,224	6,195,963	881,003	0	0	0	33,172,985
Capping Portage Dump	0	0	0	0	0	0	627,000	627,000	627,000	627,000	2,508,000
Portage SURPLUS	13,294	98,717	6,896,910	3,953,643	3,845,476	5,209,161	881,003	0	0	0	20,898,204
Goose SURPLUS	0	0	0	7,350,231	3,937,748	986,802	0	0	0	0	12,274,781
Vault Pit SURPLUS	0	0	0	0	0	0	0	0	0	0	0
WASTE MATERIALS BALANCE											
WASTE REQUIREMENTS[1]	1,204,573	3,786,637	4,650,150	9,223,259	8,666,722	2,384,402	1,461,013	0	0	0	31,376,756
WASTE ROCK PRODUCTION[1,7]	1,726,468	4,069,129	28,050,981	31,981,110	24,512,979	18,941,829	4,802,096	0	0	0	114,084,593
ROCK TO PORTAGE PIT[2,3,4]	-	-	-	-	6,684,960	12,835,385	3,319,756	0	-	-	22,840,101
WASTE TO PORTAGE RSF[2,3,4,5]	521,895	696,523	23,400,830	22,757,851	9,161,297	3,722,042	648,328	627,000	627,000	627,000	62,789,766
WASTE TO VAULT RSF[6]	0	0	0	0	0	5,210,542	25,892,381	21,958,293	14,397,119	748,483	68,206,819

MINED TONNAGES	**Year - 2**	**Year -1**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Total**
PORTAGE AREA											
Intermediate Volcanic (tonnes)	455,590	745,244	6,911,279	2,456,475	1,958,130	2,453,951	955,588	0	0	0	15,936,257
Ultramafic (tonnes)	234,251	488,637	7,350,590	5,060,222	4,748,332	4,720,807	1,538,463	0	0	0	24,141,303
Iron Formation (tonnes)	412,727	1,577,232	11,696,997	2,708,114	4,026,421	7,482,194	2,264,706	0	0	0	30,168,391
Quartzite (tonnes)	0	42,616	21,615	0	285,298	562,835	22,012	0	0	0	934,375
Till (tonnes)	623,900	1,215,400	2,070,500	0	756,631	1,431,173	21,328	0	0	0	6,118,932
Total Waste (tonnes)	1,726,468	4,069,129	28,050,981	10,224,812	11,774,813	16,650,960	4,802,096	0	0	0	77,299,258
Ore (tonnes)	110,700	387,000	2,604,800	2,510,277	1,914,243	2,524,703	1,126,067	0	0	0	11,177,789
GOOSE AREA											
Intermediate Volcanic (tonnes)	0	0	0	5,713,224	3,212,105	565,195	0	0	0	0	9,490,525
Ultramafic (tonnes)	0	0	0	9,278,686	7,504,081	986,802	0	0	0	0	17,769,569
Iron Formation (tonnes)	0	0	0	1,638,744	1,579,313	738,872	0	0	0	0	3,956,928
Quartzite (tonnes)	0	0	0	2,080,545	442,667	0	0	0	0	0	2,523,212
Till (tonnes)	0	0	0	3,045,100	0	0	0	0	0	0	3,045,100
Total Waste (tonnes)	0	0	0	21,756,299	12,738,167	2,290,869	0	0	0	0	36,785,334
Ore (tonnes)	0	0	0	592,223	1,188,257	466,824	0	0	0	0	2,247,305
VAULT AREA											
Intermediate Volcanic (tonnes)	0	0	0	0	0	5,210,542	25,892,381	21,958,293	14,397,119	748,483	68,206,819
Ultramafic (tonnes)	0	0	0	0	0	0	0	0	0	0	0
Iron Formation (tonnes)	0	0	0	0	0	0	0	0	0	0	0
Quartzite (tonnes)	0	0	0	0	0	0	0	0	0	0	0
Till (tonnes)	0	0	0	0	0	0	0	0	0	0	0
Total Waste (tonnes)	0	0	0	0	0	5,210,542	25,892,381	21,958,293	14,397,119	748,483	68,206,819
Ore (tonnes)	0	0	0	0	0	110,973	1,976,433	3,102,500	3,102,500	175,875	8,468,281

Notes:
1. All construction material will come from the Portage and Goose Pits
2. Deficits are assumed to be zero, except when Portage deficits can be accomodated by Goose surpluses.
3. All surplus Portage and Goose material will be placed in thePortage RSF, except in years 3 - 5, when Portage waste rock will be backfilled into Portage Pit.
4. The proportion of UM and QZ as waste material is assumed to be the same as the proportion of UM and QZ mined.
5. From year 5 onward, the Portage RSF will be capped with stockpiled UM material.
6. All surplus Vault material will be placed in the Vault RSF.
7. Waste Rock Production calculation only includes material from Goose and Portage
8. Tonnages shown are based on impermeable element management strategy 1, as discussed in "Detailed Design of Central Dike, Meadowbank Gold Project" (Golder, 2007).
Volumes (m^3) converted to tonnes using density: 3.1 t/m^3 (ore), 1.9 t/m^3 (Till), 1.9 t/m^3 (IV), 2.2 t/m^3 (IF), and 1.9 t/m^3 (UM+QZ)

Along with the NP and AP data obtained for each rock type to date, these waste rock and till volumes were used to estimate the annual and cumulative ARD potential of each of the RSFs and the waste to be backfilled into the pit, based on NPR. These values were derived using the following equations:

$$\text{Annual NPR} = \frac{\Sigma\text{Sum } NP_x * \%_x)}{\Sigma(\text{Sum } AP_x * \%_x)}, \text{ and}$$

$$\text{Cumulative NPR} = \frac{(V_A/Vc) * \Sigma\text{Sum } NP_x * \%_x)}{(V_A/Vc) * \Sigma(\text{Sum } AP_x * \%_x)},$$

Where:

x = rock type;
V_A = total annual volume to be placed in storage area; and
V_C = total cumulative volume within storage area.

Tables 4-2 to 4-4 present these values. As shown in these tables, the material that will be stored in each of these areas is predicted to be NPAG on an annual basis.

Table 4-1: Portage Rock Storage Facility Bulk ARD Summary

Operation Year	Annual NPR[1]	Annual ARD Potential[2]	Annual Percentage of Waste Type (%)				
			Till	IV	IF	UM	QZ
-2	8.3	NPAG	96	2	0	3	0
-1	14.4	NPAG	86	0	0	13	1
1	2.9	NPAG	6	24	41	29	0
2	6.1	NPAG	13	24	13	43	6
3	5.0	NPAG	5	35	17	41	2
4	3.8	NPAG	38	15	20	24	2
5	15.8	NPAG	3	0	0	95	1
6	15.5	NPAG	0	0	0	95	5
7	15.5	NPAG	0	0	0	95	5
8	15.5	NPAG	0	0	0	95	5
Operation Year	**Cumulative NPR[1]**	**Cumulative ARD Potential[2]**	**Cumulative Percentage of Waste Type (%)**				
			Till	**IV**	**IF**	**UM**	**QZ**
-2	8.3	NPAG	96	2	0	3	0
-1	12.9	NPAG	90	1	0	9	1
1	2.9	NPAG	10	23	39	28	0
2	4.1	NPAG	11	24	26	36	3
3	4.2	NPAG	10	25	25	36	3
4	4.2	NPAG	12	25	25	36	3
5	4.3	NPAG	12	25	24	36	3
6	4.3	NPAG	12	24	24	37	3
7	4.4	NPAG	12	24	24	37	3
8	4.4	NPAG	12	24	24	38	3

Table 4-2: Portage Pit Backfill Bulk ARD Summary

Operation Year	Annual NPR[1]	Annual ARD Potential[2]	Annual Percentage of Waste Type (%)			
			IV	IF	UM	QZ
3	6.3	NPAG	27	16	54	3
4	3.3	NPAG	19	40	37	4
5	2.5	NPAG	28	46	26	0
Operation Year	**Cumulative NPR[1]**	**Cumulative ARD Potential[2]**	**Cumulative Percentage of Waste Type (%)**			
			IV	**IF**	**UM**	**QZ**
3	6.3	NPAG	27	16	54	3
4	4.1	NPAG	22	32	43	4
5	3.8	NPAG	23	34	40	3
Notes:						
1. NPR values based on sum AP/sum NP of rock types within RSF						
2. Based on INAC ARD Criteria (1992)						

Table 4-3: Vault Rock Storage Facility Bulk ARD Summary

Operation Year	Annual NPR[1]	Annual ARD Potential[2]	Annual Percentage of Waste Type (%)			
			Till	IV	IF	UM/QZ
4	2.5	NPAG	0	100	0	0
5	2.5	NPAG	0	100	0	0
6	2.5	NPAG	0	100	0	0
7	2.5	NPAG	0	100	0	0
8	2.5	NPAG	0	100	0	0
Operation Year	**Cumulative NPR[1]**	**Cumulative ARD Potential[2]**	**Cumulative Percentage of Waste Type (%)**			
			Till	**IV**	**IF**	**UM/QZ**
4	2.5	NPAG	0	100	0	0
5	2.5	NPAG	0	100	0	0
6	2.5	NPAG	0	100	0	0
7	2.5	NPAG	0	100	0	0
8	2.5	NPAG	0	100	0	0
Notes:						
1. NPR values based on sum AP/sum NP of rock types within RSF						
2. Based on INAC ARD Criteria (1992)						

SECTION 5 • PERFORMANCE MONITORING

The water quality of the drainage from the RSFs and UM stockpile, and the Portage pit lake will be monitored during operation and post-closure. Details on the monitoring plan are provided in (MMC, 2007b).

SECTION 6 • REPORTING

The results of all of the testing completed on waste materials during operation at Meadowbank will be compiled and reported annually to the Nunavut Water Board (NWB) and NIRB. It is also proposed that the block model be updated on an annual basis with pit wall and/or drill core test results relating to ARD/ML potential, to ascertain whether any correlations can be made between these parameters and geologic variability within rock types for an enhanced ability to predict the quality of rock in advance of mining.

SECTION 7 • LITERATURE CITED

AMEC, 2005. Cumberland Production Forecast Schedule.

BGC Engineering Inc., 2004. Meadowbank Gold Project Preliminary Geothermal and Slope Stability Modelling of Rock Storage Facilities. March 31, 2004

Cumberland Resources Ltd. (Cumberland), 2005. Meadowbank Gold Project Baseline Physical Ecosystem Report. October, 2005.

Cumberland Resources Ltd., 2006. Meadowbank Gold Project No-Net-Loss-Plan. November 2006.

Golder Associates Ltd. (Golder), 2005a. Static Testing Results of Overburden, Mine Site Infrastructure Rock, Pit Rock and Tailings, Meadowbank Gold Project Nunavut. September 2005.

Golder Associates Ltd. (Golder), 2005b. Kinetic Testing Results for Pit Rock and Tailings, Meadowbank Gold Project Nunavut. October 2005.

Golder Associates Ltd. (Golder), 2005c. Mine Site Water Quality Predictions, Meadowbank Gold Project, Nunavut. October, 2005.

Golder Associates Ltd. (Golder), 2006a. Response to request by Environment Canada for Additional Information – Meadowbank Gold Project. March 7, 2006.

Golder Associates Ltd. (Golder), 2006b. Response to Hatch Acres Final Submission – Meadowbank Gold Project. March 27, 2006.

Golder Associates Ltd. (Golder), 2007. Detailed Design of Central Dike, Meadowbank Gold Project. March 2007.

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

INAC and TFN (Indian and Northern Affairs Canada and Tungavik Federation of Nunavut), 1993. *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada*. Ottawa, Ontario: INAC and TFN. 1993.

Metal Mining Effluent Regulations (MMER), 2002, SOR/2002-222, June 6 2002.

MMC (Meadowbank Mining Corporation), 2007a. Personal Communication between Preeti Anand from Golder Associates Ltd., and Raj Anand from Meadowbank Mining Corporation. January, 2007.

MMC (Meadowbank Mining Corporation), 2007b. Water Quality and Flow Monitoring Plan. August, 2007.

Miller, S.D., A. Robertson, and T.A. Donohue, 1997. *Advances in Acid Drainage Prediction Using the Net Acid Generation (NAG) Test*. IN: Proceedings of the Fourth International Conference on Acid Rock Drainage, Vancouver, Canada, 1997.

Nunavut Impact Review Board (NIRB), 2006. Project Certificate NIRB [No. 004]. Issued December 30, 2006.

APPENDIX A

ARD/ML Potential of Meadowbank Mine Wastes

The acid rock drainage (ARD) and metal leaching (ML) potential of waste materials to be produced at Meadowbank has been evaluated through both static and kinetic testing. 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); and
- shake flask extraction (SFE).

Test methods and results are provided in (Golder, 2005a).

Kinetic testing was conducted on representative samples of waste rock from each lithology using standard 1 kg humidity cell tests, 100 kg composite column tests, and approximately 250 kg composite field cells. Test methods and results are provided in (Golder, 2005b).

Table A-1 summarizes the ARD/ML potential of the till, lake sediments and pit rock, based on the results of static and kinetic testing (Golder, 2005a and 2005b). ARD potential was evaluated by comparing ABA results to the guidelines presented in INAC (1992). ML potential was evaluated based on exceedances of the Metal Mining Effluent Regulations (MMER, 2002) in kinetic test leachate.

TABLE A 1: Summary of ARD/ML Potentials of Meadowbank Waste Types

Deposit	Waste Type	ARD Potential			MMER Metal Exceedances in Kinetic Test Leachate
		% PAG	% Uncertain	% NPAG	
-	Till	9	-	91	N/A
-	Lake Sediments	73	-	27	N/A
Vault	IV	11	14	75	None[1]
Portage/Goose	IV	20	14	66	None[1]
	IF	67	13	20	Zn
	UM	2	2	96	As
	QTZ	86	-	14	N/A

1. Based on the results corresponding to the 100 kg composite sample (Golder, 2005b).
2. Based on the results corresponding to the combined whole ore tailings composite (53% Third Portage, 8% Goose, 39% Vault) (Golder, 2005a).

PAG - potentially acid-generating
NPAG – not potentially acid-generating
N/A – not analyzed