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August 13, 2008

Via email and Xpresspost

Mr. Richard Dwyer
Licensing Administrator
Nunavut Water Board
PO Box 119
Gjoa Haven, NU X0B 1J0
Phone: (867) 360-6338

Dear Mr. Dwyer,

Re: Meadowbank Water License 2AM-MEA0815: Document Submission

As per Water license 2AM-MEA0815, please find enclosed with this letter, the document entitled '*Water Quality and Flow Monitoring Plan'* as required by Part I, Item 2.

Should you have any questions regarding this submission, please contact me directly at 604-622-6527 or via email at rgould@agnico-eagle.com.

Regards,

RL Gould

Rachel Lee Gould, M.Sc.
Project Manager, Environmental Permitting and Compliance Monitoring
Encl (1)

MEADOWBANK GOLD PROJECT

Water Quality and Flow Monitoring Plan

In Accordance with Water License 2AM-MEA0815

Prepared by:
Agnico-Eagle Mines Limited – Meadowbank Division

Version 1
August 2008

EXECUTIVE SUMMARY

The Nunavut Water Board (NWB) has issued Type A Water License 2AM-MEA0815 to Agnico-Eagle Mines Limited (AEM) for the Meadowbank Gold Project site authorizing the use of water and the disposal of waste required by mining and milling and associated uses.

AEM has prepared the following document which summarizes water quality and water flow monitoring to be conducted for the Meadowbank gold project.

This report documents the stand alone Water Quality and Flow Monitoring Plan specified under Water License 2AM-MEA0815, Part I, Item 2 and consolidates the monitoring requirements from the August 2007 Water Quality and Flow Monitoring Plan with those in the Monitoring Plan submitted under Water License 8BC-TEH0809.

Section 2 in the Plan includes an overview of the monitoring programs and mine development schedule. Specific details, including sample locations and parameters to be measured, of the compliance monitoring program are presented, along with more general guidance for the event monitoring program in Section 3. An adaptive management program is described for both regulated discharge and non-regulated discharge in Section 3 as well. Section 4 includes a summary of the QA/QC program for water quality monitoring. Requirements of the flow monitoring program are described in Section 5, and an overview of the reporting requirements in Section 6.

IMPLEMENTATION SCHEDULE

As required by Water License 2AM-MEA0815, Part B, Item 16, the proposed implementation schedule for this Plan is outlined below.

This Plan will be immediately implemented (August 2008) subject to any modifications proposed by the NWB as a result of the review and approval process**.**

DISTRIBUTION LIST

AEM:

- General Manager
- Chief Assayer
- Senior Environmental Coordinator
- Environmental Coordinator
- Environmental Technicians
- Chief Engineer
- Corporate Office – Regional Manager of Environment

DOCUMENT CONTROL

Version	Date (YMD)	Section	Page	Revision
1	08/08/10			Comprehensive plan for Meadowbank project

Prepared By: ____________________________
Rachel Lee Gould, M.Sc.
Project Manager: Environmental Permitting and Compliance Monitoring

Approved by: ____________________________
Larry Connell, P.Eng.
Regional Manager: Environmental, Social and Government Affairs

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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 Type A water license # 2AM-MEA0815. The Plan is one component of the Meadowbank Environmental Management System (EMS) and is closely associated with the *Mine Waste and Water Management Plan*, the *Aquatic Effects Management Program (AEMP*), the *Groundwater Monitoring Plan* and the *Quality Assurance/Quality Control Plan* (currently under development). The party responsible for the implementation and periodic updates to this Plan is the Meadowbank Senior Environmental Coordinator.

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

The purpose of this Water Quality and Flow Monitoring Plan (the Plan) is to establish the program to be implemented and followed by AEM's Meadowbank environmental management team to monitor the performance of the waste and water management systems at the Meadowbank Gold Project. 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 Nunavut Water Board Type A water license # 2AM-MEA0815; 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 will be 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 for discharge;
2) to identify if water treatment is required prior to discharge; and
3) to minimize the potential impact of mining activities on the surrounding environment.

Additional locations outside the footprint of the mine will be monitored under the *Meadowbank Gold Project Aquatic Effects Management Program (AEMP; October 2005*).

SECTION 2 • OVERVIEW

2.1 OVERVIEW OF SITE WATER MANAGEMENT PLAN

Details of the water management plan are discussed in the *Meadowbank Mine Waste and Water Management Plan* (*August 2007*). All contact water from the mine facilities including the Portage and Vault waste rock storage facilities, open pits, plant site, and other disturbed areas will be directed by pumping or berms and other surface diversions to either of the following:

- Sumps from which the water will be pumped to either the Portage or the Vault Attenuation Pond prior to discharge, or to the Reclaim Pond if required; or

- the open pits following the cessation of mining.

As specified in the Mine Waste and Water Management Plan:

"All contact water will be intercepted, contained, analysed, treated, if required, and discharged to the receiving environment when water quality meets the discharge criteria."

2.2 MONITORING PROGRAMS

This Plan has been divided into two levels of investigation to characterize the range of impacts between the sources of contact water in the individual mine facilities and the point of discharge or release of contact water to the receiving environment. The two levels of monitoring include 1) compliance monitoring and 2) event monitoring.

2.2.1 Compliance Monitoring Program (CM)

The CM sites are those stipulated in the water license; these sites vary from contact water collection ditches and attenuation ponds to the receiving environment. The requirements of the water license will be applied at the mine discharge points identified in the CM program.

The CM program provides a mechanism to assess the chemistry of the water at specified sites and confirm and document compliance of discharge with regulatory requirements. As part of adaptive water management, trigger levels are established to identify exceedences to predicted or regulated levels, and to activate the appropriate action plan(s) to mitigate the impacts of any exceedence.

2.2.2 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 two documents:

- Meadowbank Gold Project Spill Contingency Plan (August 2007); and
- Meadowbank Gold Project Emergency Response Plan (August 2007).

Each of these accidental releases will require specific guidelines that include: 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.

2.3 OVERVIEW OF MINE DEVELOPMENT SCHEDULE

Mining activity at the Meadowbank Gold Project is projected to progress from the south, in the area of the Goose Island and Portage pits early in the mine life (Years 1 to 5), then northward to the Vault Pit towards the end of mine life (Years 4 to 8). The staged mined development results in the southern pits being completely mined out and undergoing closure during the operational phase of the Vault Pit, while the mill and tailings storage facility operate throughout the mine life. It is for this reason that the monitoring sites change with time as the mining operations progress. Figures 2-1, 2-2, 2-3 and 2-4 show the sequence of staged development of the mine, from the early operational to the late operational, closure and post-closure phases, respectively. The actual configuration of the pits may change as mining progresses; as a result, the accumulation and flow of water between the North and Third Portage pits at the end of mine life may differ from Figure 2-2. The monitoring program (Section 3.0) will need to accommodate changes in the final pit designs which may include one or more ponds during the filling phase before the single Portage Pit Lake develops from the Portage pits. Figure 2-5 depicts the Meadowbank Gold Project facilities in the Hamlet of Baker Lake.

The staged development of the mine facilities has been divided into five phases for monitoring purposes. The five phases include:

- Pre-development and Construction phase;
- Early operational phase;
- Late operational phase;
- Closure phase; and
- Post-closure phase.

Figure 2-6 is a schematic diagram that shows the status of the different facilities during the five mining phases. The figure identifies the different activities in each facility during the operation (solid line), closure (dashed line), and post-closure monitoring phases (dotted line).

Monitoring sites associated with each phase of operation are as follows.

2.3.1 Pre-development and Construction Phase

Current mine plans call for construction of non-contact water diversion structures (ditches or berms) around mine facilities. These diversion structures will be monitored for turbidity as a field surrogate for total suspended solids (TSS). The principal impact resulting from construction activities is a potential increase in turbidity and TSS and soluble salts in the Second Portage and Third Portage lakes from the release of particulates from dike construction material, surface runoff, and the disturbance of lake sediments. Management and monitoring of these impacts are discussed in the AEMP.

2.3.2 Early Operations Phase

During the early operations phase, mining is planned to take place in the Goose Island and North and Third Portage pits. Most of the waste rock generated from the three pits will be delivered to the Portage waste rock storage facility (RSF), however some waste rock will be used for construction of mine infrastructure (roads, dikes) and fish habitat compensation features, and some will be backfilled within the Third Portage Pit. Mill tailings will report to the tailings storage facility (TSF) for final disposal. During the early operations phase, mine water from the individual pit sumps and runoff from the RSF, a small ore stockpile, and the plant area will be pumped to the Portage Attenuation Pond. Water from the Portage Attenuation Pond will be discharged to Third Portage Lake during open water season on an annual basis (Years 1 to 5). The quality of Portage Attenuation Pond water is predicted not to require treatment prior to discharge. Process water for the Process Plant will be recycled from the Reclaim Pond in the TSF and will not be discharged to the receiving environment. In closure, reclaim water will be discharged to either the Portage or Goose Island pit lakes while the dewatering dikes are still in place.

2.3.3 Later Operations Phase

Mining in the Goose Island and Portage pits will be completed in Year 5 after which the pits will be flooded by natural inflows and water transferred on a controlled basis from Third Portage Lake. Current mine plans call for the Portage and Goose Island pits to fill within roughly 8 years. During Year 6, tailings deposition will begin in the Portage Attenuation Pond basin. Ultramafic waste rock will be used to progressively cap the Portage RSF and the TSF for closure.

Mining is planned in the Vault Pit during the late operations phase with waste rock delivered to the Vault RSF and ore to the mill in the Portage area. Vault area tailings will be deposited in the Portage TSF. Runoff and infiltration drainage from the Vault RSF, dike seepage and Vault area contact water will be collected in the Vault Attenuation Pond prior to discharge to Wally Lake.

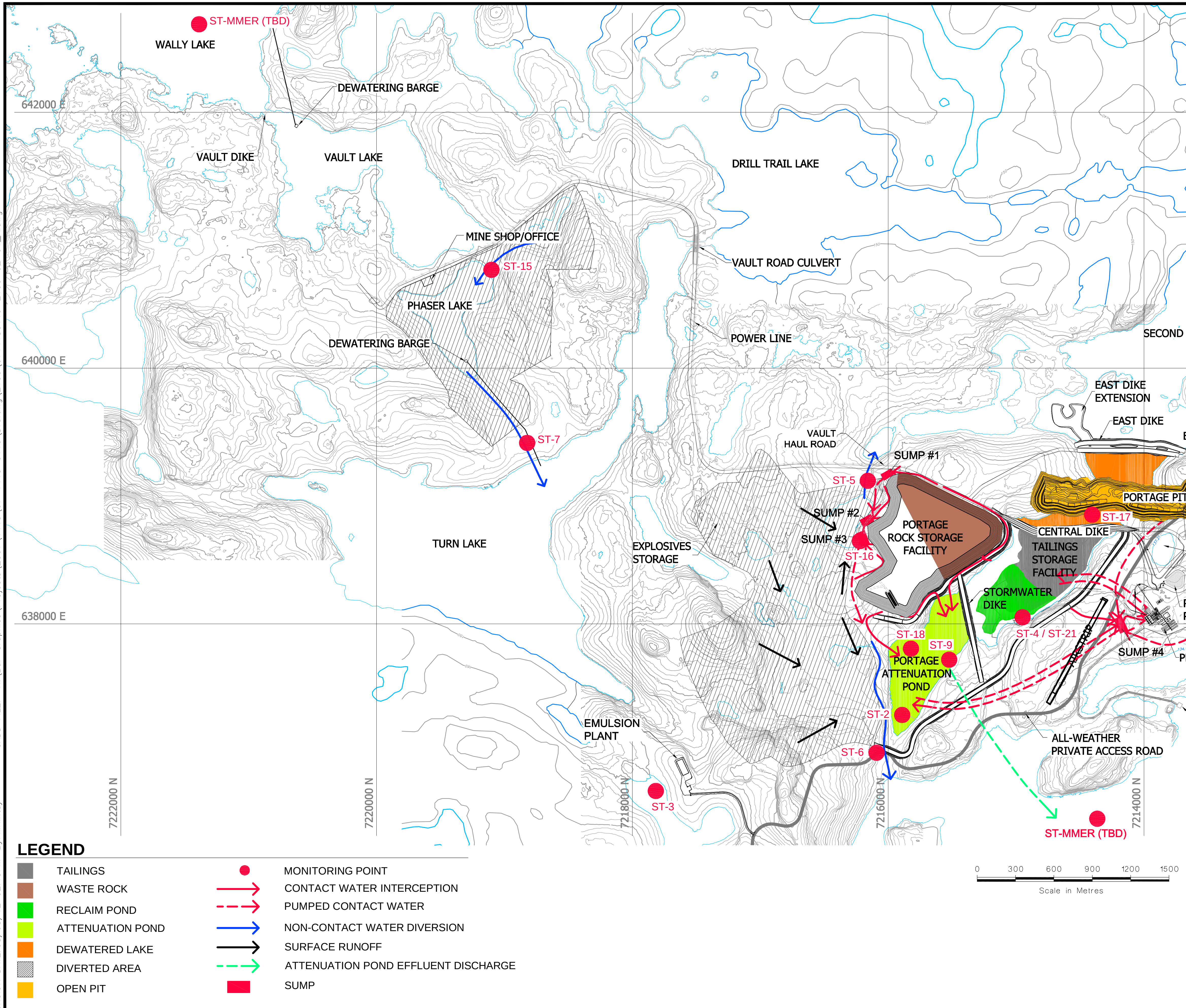
2.3.4 Closure Phase

During the closure phase, it is anticipated that mining will have ceased in the Vault Pit and the pit will be allowed to flood using natural inflows and water transferred on a controlled basis from Wally Lake. Current estimates are that it will take 5 to 6 years for the Vault Pit to completely flood by which time the Vault Attenuation Pond and the Pit Lake will have merged. There are currently no plans to cap the Vault RSF as it is not expected to generate acid rock drainage.

By the end of the late operational phase or early in the closure phase the Portage and Goose Island pits will be completely flooded and the remaining portions of the TSF capped.

2.3.5 Post Closure Phase

Activities during the post-closure phase are primarily monitoring of selected mine facilities including flooded pit lakes and the reclaimed TSF. The Goose Island and Vault Dikes will be breached once water quality within the pit lakes meets discharge criteria.



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EARLY OPERATION PHASE

FIGURE 2.1

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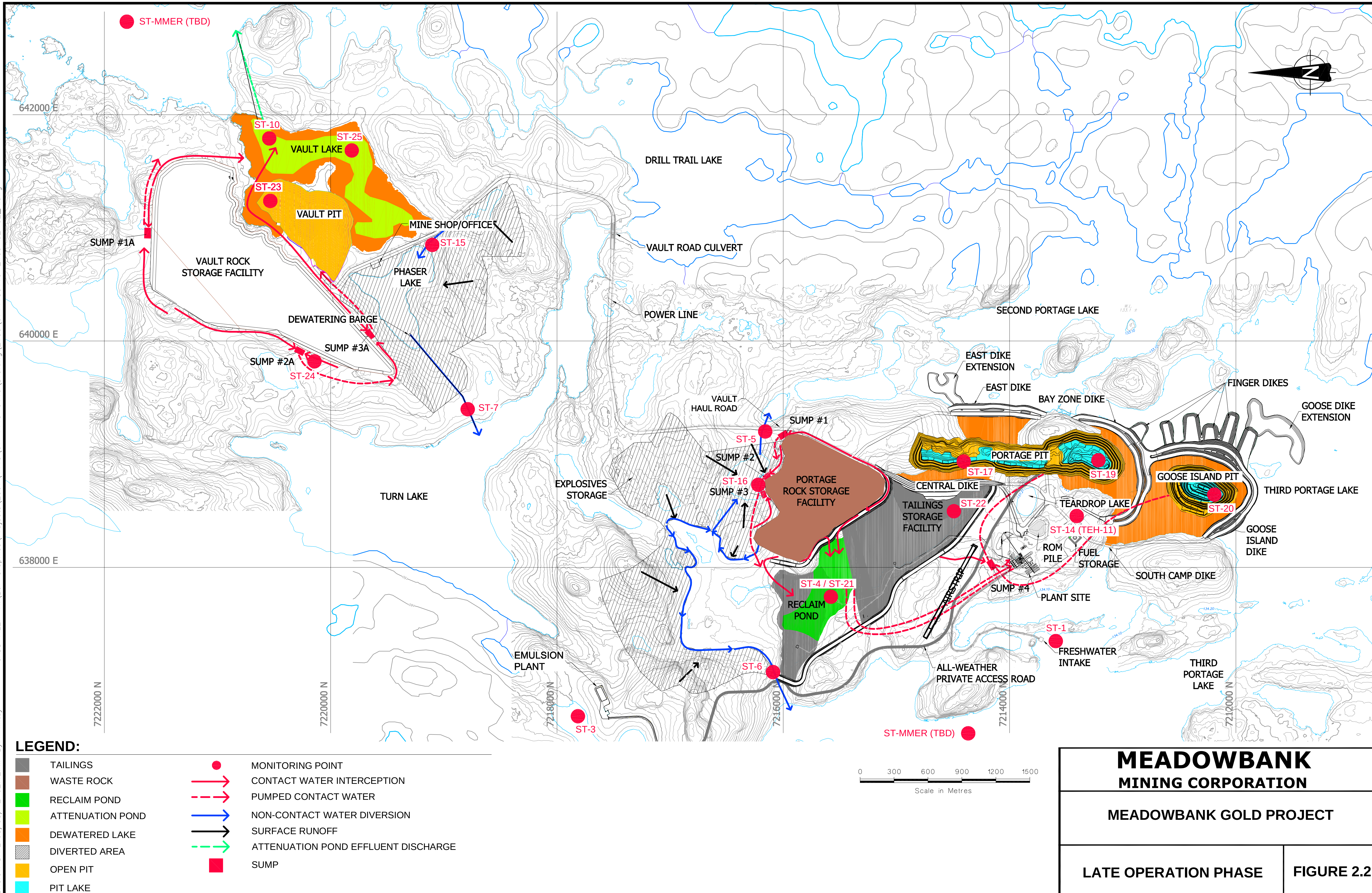

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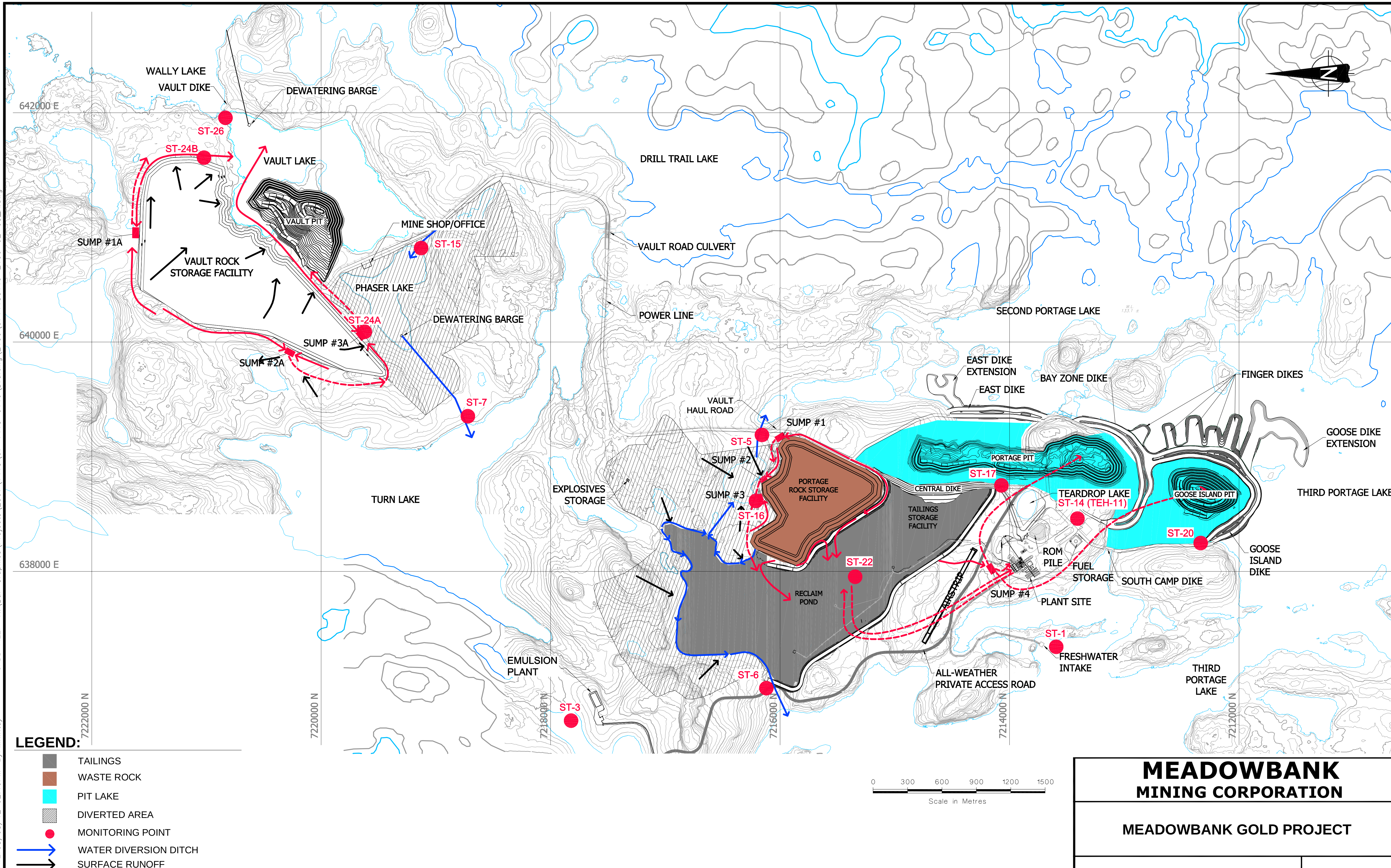
LATE OPERATION PHASE

FIGURE 2.2



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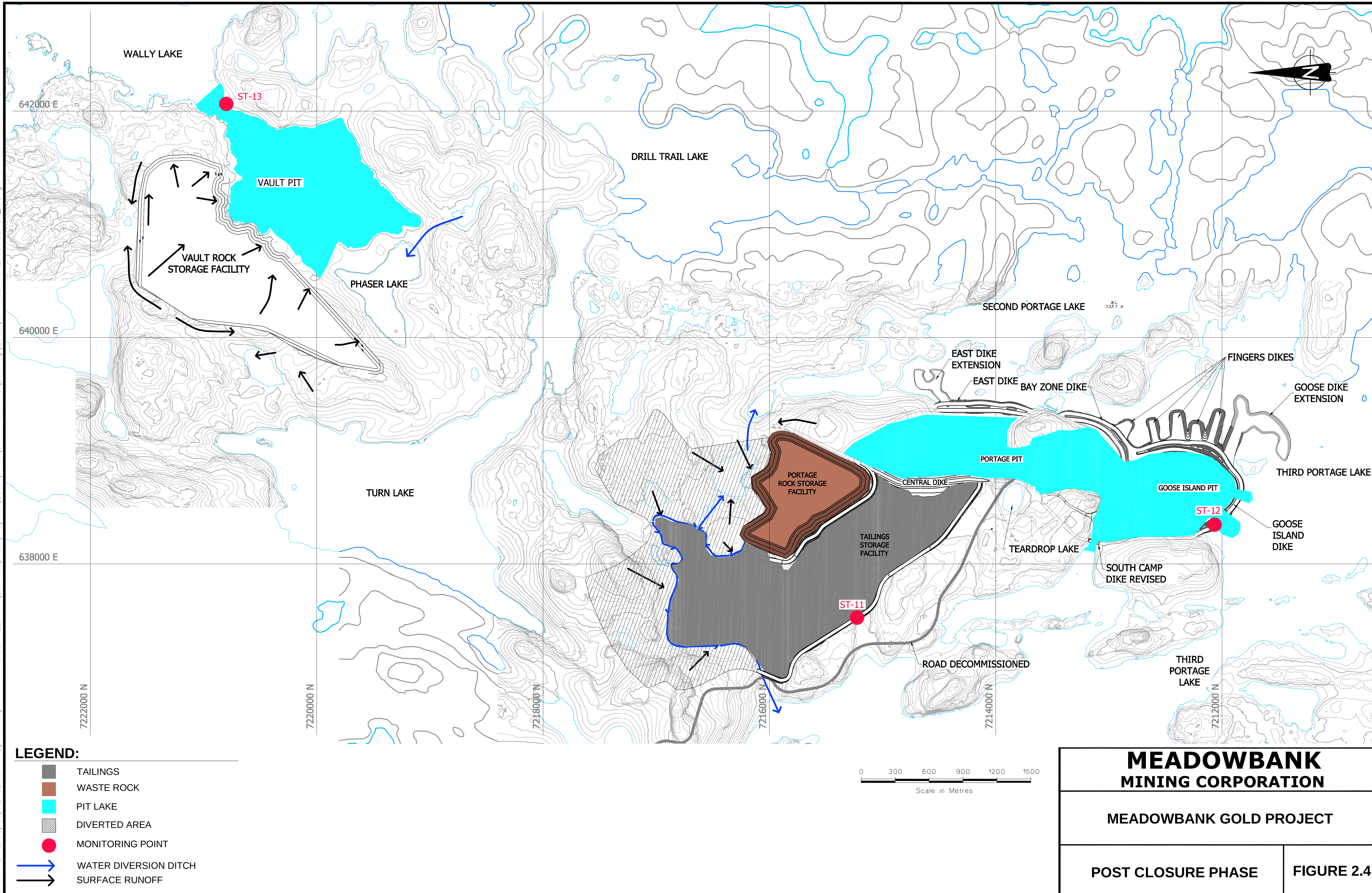
CLOSURE PHASE

FIGURE 2.3


WALLY LAKE
ST-13
642000 E
VAULT PIT
VAULT ROCK
STORAGE FACILITY
PHASER LAKE
DRILL TRAIL LAKE
640000 E
SECOND PORTAGE LAKE
EAST DIKE
EXTENSION
EAST DIKE
BAY ZONE DIKE
FINGERS DIKES
GOOSE DIKE
EXTENSION
TURN LAKE
PORTAGE PIT
PORTAGE
ROCK STORAGE
FACILITY
CENTRAL DIKE
GOOSE ISLAND PIT
THIRD PORTAGE LAKE
ST-12
GOOSE
ISLAND
DIKE
638000 E
TAILINGS
STORAGE
FACILITY
TEARDROP LAKE
SOUTH CAMP
DIKE REVISED
ST-11
ROAD DECOMMISSIONED
THIRD
PORTAGE
LAKE
7222000 N
7220000 N
7218000 N
7216000 N
7214000 N
7212000 N
LEGEND:
TAILINGS
WASTE ROCK
PIT LAKE
DIVERTED AREA
MONITORING POINT
WATER DIVERSION DITCH
SURFACE RUNOFF
0 300 600 900 1200 1500
Scale in Metres
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POST CLOSURE PHASE
FIGURE 2.4
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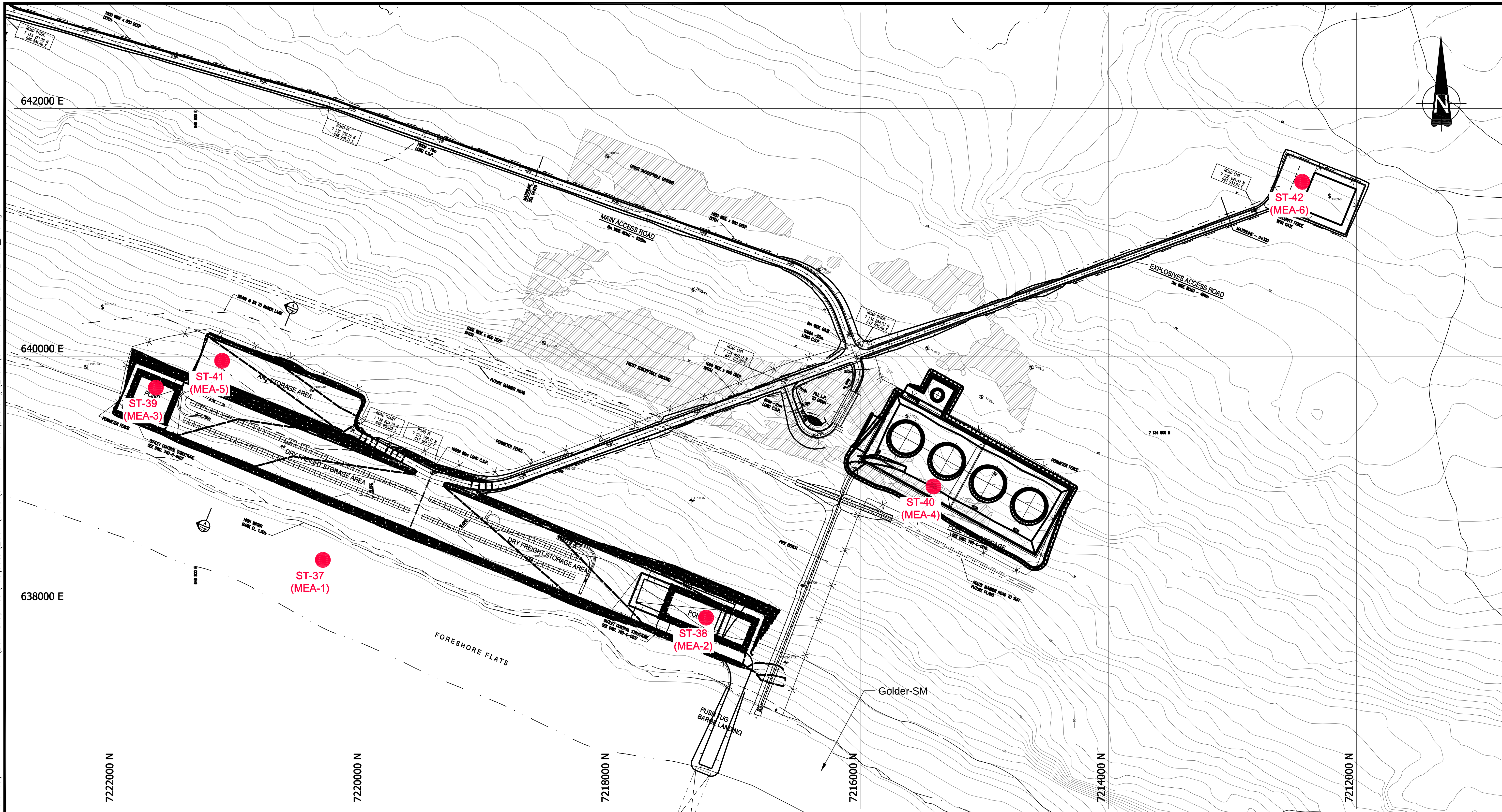

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By: MHintoy

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LEGEND

● MONITORING POINT

REFERENCES

BASE PLAN PROVIDED BY HATCH.
DRAWING NO: 740-C-0101 & 740-C-0102
DATED: JUNE 2007

0 300 600 900 1200 1500
SCALE IN METRES

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BAKER LAKE SITE FACILITIES

FIGURE 2.5

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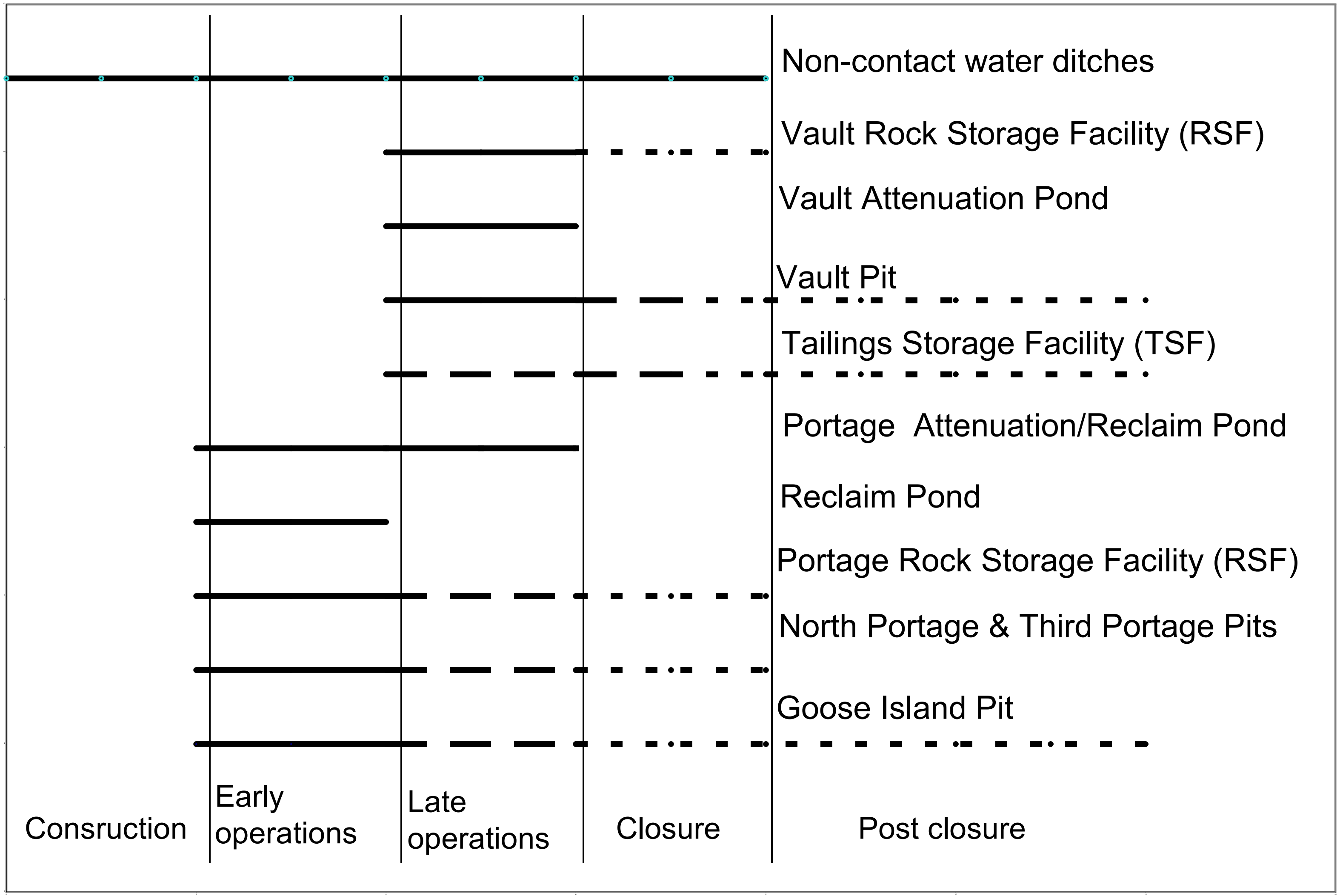

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STAGED DEVELOPMENT OF MEADOWBANK MINE FACILITIES

FIGURE 2.6

SECTION 3 • MONITORING PROGRAM

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.

3.1 COMPLIANCE MONITORING PROGRAM

The CM program monitors the chemistry of mine contact water and diverted water at specified discharge locations prior to release into the receiving water environment in order to confirm and document compliance with regulatory requirements. The types of water and the timing of the CM program include:

- non-contact water discharged from diversion ditches during construction, operations, and closure phases of the mine;
- mine contact water discharged from Attenuation Ponds during the operations phase of the mine;
- monitoring points located within the pit lakes after the dikes have been breached during the post closure phase of the mine life; and
- runoff from the Tailings Storage Facility after closure.

The CM sampling program has multiple monitoring stations across the project site, with sampling at different stages of the mine life. All of the CM stations, a description of their location, parameters to be monitored and sampling frequency are listed in Table 3-1. Specific details for the monitoring parameter groups are provided in Table 3-2.

Figures 2-1, 2-2, 2-3, 2-4 and 2-5 show the approximate location of each of the sampling sites. The actual location of each sampling site will be determined by access and safety considerations and will be marked by a highly visible stake that will define the exact location of the collection point for subsequent sampling events with appropriate attached signage.

3.1.1 General Sampling and Analysis Program

Surface grab samples or samples from diversion ditches and piped discharge points will be collected in clean laboratory-supplied containers and preserved as directed by the analytical laboratory. During the construction phase and early operational phase, samples will be analyzed offsite at an accredited commercial lab (currently set up to use Maxxam Analytics as this accredited lab with all samples going to their Montreal facility). It is intended that where practical these analyses will be performed at the onsite lab once the lab is set up and has become accredited for the parameter of concern. It is expected to take several years for this to occur given the nature of the accreditation process. Parameters for which the on-site laboratory is not accredited for must be sent to the accredited external lab under the CM program. Further details of the sampling methods are provided in Section 4.0 below.

Table 3-3 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, 1979*).

Table 3-1: Monitoring Program

Station	Description	Phase	Monitoring Parameters	Frequency
ST-DC-1 to TBD	Monitoring stations during Dike Construction as defined in Final Water Quality Monitoring and Management Plan for Dike Construction and Dewatering referred to in Part D Item 11	Construction	As defined in Final Water Quality Monitoring and Management Plan for Dike Construction and Dewatering referred to in Part D Item 11	As defined in Final Water Quality Monitoring and Management Plan for Dike Construction and Dewatering referred to in Part D Item 11
ST-DD-1 to TBD	Monitoring stations during Dike Dewatering as defined in Final Water Quality Monitoring and Management Plan for Dike Construction and Dewateringreferred to in Part D Item 11	Construction	As defined in Final Water Quality Monitoring and Management Plan for Dike Construction and Dewatering referred to in Part D Item 11	As defined in Final Water Quality Monitoring and Management Plan for Dike Construction and Dewatering referred to in Part D Item 11
ST-1	Water Intake for camp and mill	Construction, early operation, late operation, closure	Volume (m^3)	Monthly
ST-2	Reclaim Water Intake	Construction, early operation, late operation, closure	Volume (m^3)	Monthly
ST-3	Water Intake for Emulsion Plant	Construction, early operation, late operation, closure	Volume (m^3)	Monthly
ST-4	Water reclaimed from Tailings Storage Facility	Construction, early operation, late operation, closure	Volume (m^3)	Monthly
ST-5	Portage Area (east) diversion ditch	Early operation, late operation, closure	Group 5, Aluminum	Monthly during open water
ST-6	Portage Area (west) diversion ditch	Early operation, late operation, closure	Group 5, Aluminum	Monthly during open water
ST-7	Vault Area diversion ditch	Early operation, late operation, closure	Group 5, Aluminum	Monthly during open water
ST-9	Portage Attenuation Pond prior to discharge through Third Portage Lake Outfall Diffuser	Early operation	Full Suite	Prior to discharge and weekly during discharge
			Volume (m3)	Daily during periods of discharge
			Acute Lethality	Once prior to discharge and monthly thereafter

Station	Description	Phase	Monitoring Parameters	Frequency
ST-10	Vault Attenuation Pond prior to discharge through Wally Lake Outfall Diffuser	Late operation	Full Suite	Prior to discharge and weekly during discharge
			Volume (m^3)	Daily during periods of discharge
			Acute Lethality	Once prior to discharge and monthly thereafter
ST-11	Tailings Storage Facility	Post closure	MMER, Ammonia-Nitrogen, Nitrate-Nitrogen, Nitrite-Nitrogen	Annually during open water season
ST-12	Portage/ Goose Pit Lake	Post closure	Full Suite	Annually during open water season
ST-13	Vault Pit Lake	Post closure	Full Suite	Annually during open
ST-14 (TEH-11)	Discharge to the land from Landfarm sump at mine site	Pre-development, Construction, early operation, late operation, closure	Benzene, Toluene, Ethylbenzene, Lead, Oil & Grease	Prior to discharge and Weekly during discharge
			Volume (m^3)	Daily during periods of discharge
ST-15	Vault non-contact diversion ditch	Early operation, late operation, closure	Group 5, Aluminum	Monthly during open water
ST-16	Portage Rock Storage Facility	Early operation	Group 3	Bi-annually during open water
			Total Metals	Once annually immediately following spring freshet
		Late operation	Group 2	Monthly during open water
		Closure	Group 3	Bi-annually during open water
			Total Metals	Once annually immediately following spring freshet
ST-17**	North Portage Pit Sump	Early operation	Group 2	Monthly during open water
			Group 3	Bi-annually during open water
			Volume (m^3)	Daily during periods of discharge
	Portage Pit Lake	Late operation	Group 4	Monthly during open water
		Closure	Group 3	Bi-annually during open water
ST-18	Portage Attenuation Pond	Early operation	Group 2	Monthly during open water
			Group 3	Bi-annually during open water
ST-19**	Third Portage Pit Sump	Early operations	Group 2	Monthly during open water
			Group 3	Bi-annually during open water
			Volume (m^3)	Daily during periods of discharge
	Third Portage Pit Lake	Late operations	Group 4	Monthly during open water

Station	Description	Phase	Monitoring Parameters	Frequency
ST-20	Goose Island Pit Sump	Early operations	Group 2	Monthly during open water
			Group 3	Bi-annually during open water
			Volume (m3)	Daily during periods of discharge
	Goose Island Pit Lake	Late operations	Group 4	Monthly during open water
		Closure	Group 3	Bi-annually during open water
ST-21	Tailings Reclaim Pond	Early operation (south of central dike)	Group 3, Cyanide	Monthly during open water
			Total Metals	Once annually immediately following spring freshet
		Late operation (north of central dike)	Group 3, Cyanide	Bi-annually during open water
			Total Metals	Once annually immediately following spring freshet
ST-22	Tailings Storage Facility	Late operation	Group 3, Cyanide	Bi-annually during open water
			Total Metals	Once annually immediately following spring freshet
		Closure (drainage runoff)	Group 3, Cyanide	Bi-annually during open water
			Total Metals	Once annually immediately following spring freshet
ST-23	Vault Pit Sump	Late operations	Group 2	Monthly during open water
			Group 3	Bi-annually during open water
			Volume (m^3)	Daily during periods of discharge
ST-24***	Vault Rock Storage Facility	Late operation	Group 2	Monthly during open water
			Group 3	Bi-annually during open water
			Total Metals	Once annually immediately following spring freshet
		Closure (east ditch) ST-24-A	Group 3	Monthly during open water
			Total Metals	Once annually immediately following spring freshet
		Closure (west ditch) ST-24-B	Group 3	Monthly during open water
			Total Metals	Once annually immediately following spring freshet
ST-25	Vault Attenuation Pond	Late operation	Group 2	Monthly during open water
			Total Metals	Once annually immediately following spring freshet
			Group 3	Bi-annually during open water
ST-26	Vault Pit Lake	Closure	Group 4	Monthly during open water (flooding)
			Group 3	Quarterly (fully flooded)
		Construction	Group 3	Monthly during open water

Station	Description	Phase	Monitoring Parameters	Frequency
ST-S-1 to TBD	Seeps (to be determined)	Early operations, late operations, closure	Group 1	Monthly or as found
ST-GW-1 to TBD	Groundwater wells (to be determined)	Construction, early operations, late operations, closure	Group 3	Annually
ST-AEMP-1 to TBD	Receiving AEMP	Construction, early operations, late operations, closure	Group 4	Monthly during open water season at all AEMP stations. Monthly throughout year at a smaller number of locations (through ice)
ST-MMER-1 to TBD	Vault and Portage effluent outfall	Early and late operations	MMER	Weekly during open water
8BC-TEH0809				
ST-27 and ST-28 (TEH-1 & TEH-2)	Water Intake for camp and concrete batch plant purposes	Pre-development, Construction	Volume for each purpose (m^3)	Monthly
ST-29 and ST-30 (TEH-3 & TEH-4)	Water, if any, accumulated in north and south pre-development zones	Pre-development	pH, Turbidity	Weekly
			Metals using an ICP-Metals 36 element scan, Total Ammonia, Nitrate, Sulphate	Monthly
ST-31 and ST-32 (TEH-5 & TEH-6)	Water pumped from north and south pre-development zones to Contact Water Collection System	Pre-development	pH, Turbidity	Daily during periods of pumping
ST-33 and ST-34 (TEH-7 & TEH-8)	Contact Water Collection System Lakes #1 and #2	Pre-development, Construction	pH, Turbidity, Metals using an ICP-Metals 36 element scan, Total Ammonia, Nitrate, Sulphate	Weekly during periods of pumping from the pre-development pits
ST-35 (TEH-9)	Discharge from Lake #1 of Contact Water Collection System (Stormwater Management Pond) to Second Portage Lake	Pre-development, Construction	pH, TSS, T-Al, BOD5, Fecal Coliforms, T-As, T-Cu, T-CN, T-Pb, T-Ni, T-Zn, T-$Radium_{226}$	Once prior to discharge and weekly during periods of discharge
			Acute Lethality	Once prior to discharge and monthly thereafter
			Volume (m^3)	Daily during periods of discharge
	In addition, if discharge from Bulk Fuel Storage Facility directed to Lake #1		Benzene, Lead, Toluene, Ethylbenzene, Oil & Grease	Once prior to discharge and weekly during periods of discharge

Station	Description	Phase	Monitoring Parameters	Frequency
ST-36 (TEH-10)	Discharge from Lake #2 of Contact Water Collection System to Second Portage Lake	Pre-development, Construction	pH, TSS, T-As, T-Cu, T-CN, T-Pb, T-Ni, T-Zn, T-$Radium_{226}$	Once prior to discharge and weekly during periods of discharge
			Acute Lethality	Once prior to discharge and monthly thereafter
			Volume (m^3)	Daily during periods of discharge
8BC-MEA0709				
ST-37 (MEA–1)	Water sample location at Baker Lake in close proximity to the construction facilities	Pre-development, construction, early operation, late operation, closure	Group 6	Annually
ST-38 (MEA-2)	East Contact Water Pond located in the south-east corner of the lay-down area	Pre-development, construction, early operation, late operation, closure	Group 6 & 7	Prior to discharge or transfer of effluent
			Volume (m^3)	Monthly
ST-39 (MEA-3)	West Contact Collection Pond located in the south-west corner of the lay-down area	Pre-development, construction, early operation, late operation, closure	Group 6 & 7	Prior to discharge or transfer of Effluent
			Volume (m^3)	Monthly
ST-40 (MEA-4)	Secondary containment sump at the Bulk Fuel Storage Facility	Pre-development, construction, early operation, late operation, closure	Group 6 & 7	Prior to discharge or transfer of Effluent
ST-41 (MEA-5)	Water sample location at the ammonium nitrate storage area	Pre-development, construction, early operation, late operation, closure	Group 7	Prior to discharge or transfer of Effluent
ST-42 (MEA-6)	Water sample location at the explosive storage area	Pre-development, construction, early operation, late operation, closure	Group 7	Prior to discharge or transfer of Effluent

* ST-17 and ST-19 in closure become one sampling point
** during closure, two contact water monitoring points will be assigned to the Vault Storage Facility at ST-24

Table 3-2: Monitoring Parameters

Group	Parameters
1	pH, turbidity, hardness, alkalinity, ammonia, aluminum, arsenic, barium, cadmium, chloride, chromium, copper, fluoride, iron, lead, manganese, mercury, molybdenum, nickel, nitrate, selenium, silver, sulphate, thallium, zinc
2	pH, turbidity, total dissolved solids, alkalinity, ammonia, arsenic, copper, lead, nickel, zinc
3	pH, alkalinity, turbidity, hardness, ammonia nitrogen, nitrate, nitrite, chloride, fluoride, sulphate, total dissolved solids, **total and free cyanide for wells in ground water flow path of the tailings storage facility**; Dissolved Metals: aluminum, arsenic, barium, cadmium, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, thallium and zinc
4	Total and Dissolved Metals: aluminum, antimony, arsenic, boron, barium, beryllium, cadmium, copper, chromium, iron, lithium, manganese, mercury, molybdenum, nickel, lead, selenium, tin, strontium, titanium, thallium, uranium, vanadium and zinc; Nutrients: ammonia-nitrogen, total kjeldahl nitrogen, nitrate nitrogen, nitrite-nitrogen, ortho-phosphate, total phosphorous, total organic carbon, total dissolved organic carbon and reactive silica; Conventional Parameters: bicarbonate alkalinity, chloride, carbonate alkalinity, conductivity, hardness, calcium, potassium, magnesium, sodium, sulphate, pH, total alkalinity, total dissolved solids and total suspended solids
5	MMER parameters (total cyanide, arsenic, copper, lead, nickel, zinc, radium 226, total suspended solids, pH), sulphate and turbidity
6	pH, total suspended solids, electrical conductivity, total ammonia, total arsenic, total trace metals as determined by a standard ICP Scan (to include at a minimum the following elements: Al, Sb, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Mo, Ni, Se, Sn, Sr, Tl, Ti, U, V, Zn), oil & grease, total petroleum hydrocarbons, benzene, toluene, ethylbenzene, xylene
7	Total arsenic, total copper, total lead, total nickel, total suspended solids, ammonia, cyanide, benzene, toluene, ethylbenzene, lead, oil & grease, pH
MMER	Total cyanide, arsenic, copper, lead, nickel, zinc, radium 226, total suspended solids, pH, effluent volumes and flow rate of discharge, acute toxicity, Daphnia magna, and Environmental Effects Monitoring (EEM)
Full Suite	Group 4, total petroleum hydrocarbons, turbidity

Table 3-3: **Summary of Sampling Requirements for each Analyte**

Parameter	Min. Vol. (ml)	Bottle[b]	Preservation	Holding Time
pH	25	P,G	None	Immediately (on site measurement)
Conductivity	50	P	Unfiltered, cool 4˚C	28 days
Alkalinity	100	P,G	Unfiltered, cool 4˚C	14 days
Hardness	250	P	HNO3- pH below 2	6 months
Mineral Oil and Grease	1000	G (Amber)	Unfiltered, cool 4˚C HCl (optional)	7 days w/o HCl; 28 days with HCl
VOC	2 x 40	vials	HCl, cool 4˚C	7 days
NO3_N	100	P,G	Unfiltered, cool 4˚C	48 hrs
BOD	1000	P	Unfiltered, cool 4˚C	2 days
F. coli	500	P	Unfiltered, cool 4˚C; $Na_2S_2O_3$	2 days
NH3_N	400	P,G	cool 4˚C, H_2SO4 – pH below 2	28 days
SO_4	50	P,G	Unfiltered, cool 4˚C	28 days
TSS	1000	P	Unfiltered, cool 4˚C	7 days
TDS	200	P	Unfiltered, cool 4˚C	7 days
Turbidity	100	P	Unfiltered, cool 4˚C	48 hours
F	300	P,G	None	28 days
Cl	50	P,G	None	28 days
Total Cyanide	500	P	Unfiltered, cool 4˚C in dark; NAOH over 12	14 days
Free Cyanide	500	P	Unfiltered, cool 4˚C in dark; NAOH over 12	14 days
Ag	200	P,G	Filtered on site, HNO_3 – ph below 2	6 months
Al	200	P,G	Filtered on site, HNO_3 – ph below 2	6 months
As	200	P,G	Filtered on site, HNO_3 – ph below 2	6 months
Cd	200	P,G	Filtered on site, HNO_3 – ph below 2	6 months
Cr	200	P,G	Filtered on site, HNO_3 – ph below 2	6 months
Cu	200	P,G	Filtered on site, HNO_3 – ph below 2	6 months
Fe	200	P,G	Filtered on site, HNO_3 – ph below 2	6 months

Parameter	Min. Vol. (ml)	Bottle[b]	Preservation	Holding Time
Hg	100	P,G	Filtered on site, HNO_3 – ph below 2	28 days
Mo	200	P,G	Filtered on site, HNO_3 – ph below 2	6 months
Ni	200	P,G	Filtered on site, HNO_3 – ph below 2	6 months
Pb	200	P,G	Filtered on site, HNO_3 – ph below 2	6 months
Se	200	P,G	Filtered on site, HNO_3 – ph below 2	6 months
Tl	200	P,G	Filtered on site, HNO_3 – ph below 2	6 months
Zn	200	P,G	Filtered on site, HNO_3 – ph below 2	6 months

[(a)] USEPA Methods for Chemical Analysis of Water and Waste Water, EPA-600/4-79-020.
[(b)] P: plastic bottle; G: glass bottle

3.1.2 Compliance Monitoring Stations and Discharge Criteria

Further details of the specific CM stations and discharge criteria stipulated under the Nunavut Water Board Type A Water License are provided below.

3.1.2.1 Construction and Dewatering Activities

In order to mine the ore in the Portage, Goose and Vault pits, a series of dikes will be built to isolate the pits from the surrounding water bodies. The pits, and the corresponding tailings impoundment area, will be dewatered to allow access to these areas. The document "*Water Quality Monitoring and Management Plan for Dike Construction and Dewatering at the Meadowbank Mine (July 2008*)" has been prepared to specifically address the monitoring requirements for these activities.

CM stations ST-DC-1 to TBD (to be decided) and ST-DD-1 to TBD monitor the dike construction and dewatering activities. As stipulated in Part D, Section 15 of the water license, TSS levels at these stations will be compared to the maximum monthly mean and short term maximum values presented in Table 3-4.

Table 3-4: TSS Criteria at CM Stations ST-DC and ST-DD

Parameter	Maximum Monthly Mean (mg/L)	Short Term Maximum (mg/L)
TSS in areas where there is spawning habitat and at times when eggs or larvae are expected to be present (applied at monitoring stations located closest to the high value shoal areas starting Sept 1, 2008)	6	25
TSS in all other areas and at times when eggs/larvae are not present	15	50
TSS in impounded areas (e.g. northwest arm of second portage lake) at all times in all areas.	15	50

As the dewatering process takes place, effluent from CM stations ST-DD-1 to ST-DD to TBD must not exceed the parameter concentrations presented in Table 3-5, as stipulated in Part D, Section 16 of the water license.

Table 3-5: Effluent Criteria at CM Station ST-DD

Parameter	Maximum Monthly Mean	Short Term Maximum
Total Suspended Solids	15.0 mg/L	22.5 mg/L
Turbidity	15 NTU	30 NTU
pH	6.0 to 9.0	6.0 to 9.0
Total Aluminum	1.5 mg/L	3.0 mg/L

All surface runoff during the construction of any facility at the Meadowbank Gold Project, where water flow may directly or indirectly enter a water body, shall not exceed the TSS water quality limits presented in Table 3-6, as stipulated in Part D, Section 24 of the water license.

Table 3-6: TSS Criteria for All Surface Runoff during the Construction of Any Facility

Parameter	Maximum Average Concentration (mg/L)	Maximum Concentration of Any Grab Sample (mg/L)
Total Suspended Solids	50.0	100.0

3.1.2.2 Water Collection System

A water collection system comprised of ditches, sumps, attenuation ponds, stormwater management ponds, and open pits has been developed to control surface water at the Meadowbank project. Water that may potentially come into contact with waste rock, tailings or contaminated material is segregated from non-contact water, collected in ponds and treated, if necessary, prior to discharge into the receiving environment.

The design of the ditches is based on the assumption that drainage can be achieved by gravity flow; the design for the sumps and ponds assumes that all inflows can be achieved by gravity. As a result, this infrastructure is considered as low maintenance. However, regular monitoring during the snowmelt and ice-free season, and during heavy or prolonged rainfall is required to identify any issues with regards to:

- The configuration or structure of the channel, due to localized thawing, local ground instabilities, subsidence and transport of fine particles;
- The free flow of water, due to an accumulation of ice, sediments and other debris; and
- Potential damage to retention structures.

Maintenance operations should consist of cleaning accumulated sediments and debris from the ditches and culverts, and repairing damaged areas as soon as possible. Removed sediments should be stockpiled for channel maintenance purposes or disposed of in the tailings impoundment.

The pumping systems (pump and connected piping) to be used for site water management structures should be sized to have a sufficient capacity for dewatering the maximum pond volume within a one week period, provided the water to be discharged is of suitable quality. Pumps should be operated based on the quality and volume of water accumulated within the ponds. Particular attention will be required in this maintenance program to ensure that no water freezes in the pump system. No water should be allowed to sit in the pumps or piping system when temperatures are near, or below, +1 degrees Celsius.

Two on-land starter pits (north and south pre-development zones) are to be developed on the Portage deposit to provide broken rockfill material required to construct the East Dike. Water samples from the open pits will be collected either directly from the sumps or from the discharge lines of the pumped water. During pit flooding, sampling sites will be located along the banks of the pits. It is likely that the sampling sites will change as the pits are mined to greater depth and as the water level in the pits rise in response to flooding. It is anticipated that during the early flooding phase of the Portage Pit, water may accumulate in more than one area of the pit (Section 2.3). The current monitoring program assumes separate samples will be collected from ponds in the North Portage and the Third Portage pits during flooding and prior to the two water bodies merging into a single pit lake.

The following is a list of the various areas of the water collection system at the Meadowbank mine where samples for the compliance monitoring program is to be collected:

- Portage and Goose Island ditches, sumps, ponds and pit lakes (ST-5; ST-6; ST-9; ST-12; ST-17; ST-18; ST-19; ST-20; ST-29; ST-30; ST-31; ST-32ST-33; ST-34; ST-35; ST-36);

- Vault area ditches, sumps, ponds and pit lake (ST-7; ST-10; ST-13; ST-23; ST-25; ST-26); and
- Non-contact diversion ditches (ST-15).

Effluent discharged from the Portage Attenuation Pond at CM station ST-9 shall be directed to Third Portage Lake through the Third Portage Lake Outfall Diffuser and shall not exceed the effluent quality limits presented in Table 3-7, as stipulated in Part F, Section 2 of the water license.

Table 3-7: Effluent Criteria at CM Station ST-9

Parameter	Maximum Average Concentration	Maximum Allowable Grab Sample Concentration
pH	6.0 to 9.0	6.0 to 9.0
TSS (mg/L)	15	30
Turbidity (NTU)	15	15
Total (T)-Al (mg/L)	1.5	1.5
Dissolved (D)-Al (mg/L)	1.0	1.0
T-As (mg/L)	0.30	0.60
T-Cd (mg/L)	0.002	0.004
T-CN	0.5	1.0
T-Cu (mg/L)	0.1	0.2
T-Hg (mg/L)	0.0004	0.0008
NH3-N (mg/L)	16	32
T-Ni (mg/L)	0.2	0.4
T-NO3-N (mg/L)	20	40
T-Pb (mg/L)	0.10	0.20
T-P (mg/L)	1.0	2.0
T-Zn (mg/L)	0.4	0.8
T-Cl^- (mg/L)	1000	2000
Total Petroleum Hydrocarbons (TPH) (mg/L)	3	6

Effluent discharged from the Vault Attenuation Pond at CM station ST-10 shall be directed to Wally Lake through the Wally Lake Outfall Diffuser and shall not exceed the effluent quality limits presented in Table 3-8, as stipulated in Part F, Section 3 of the water license.

Table 3-8: Effluent Criteria at CM Station ST-10

Parameter	Maximum Average Concentration	Maximum Allowable Grab Sample Concentration
pH	6.0 to 9.0	6.0 to 9.0
TSS (mg/L)	15	30
Turbidity (NTU)	15	15
Total (T)-Al (mg/L)	1.5	3.0
Dissolved (D)-Al (mg/L)	1.0	2.0
T-As (mg/L)	0.1	0.2
T-Cd (mg/L)	0.002	0.004
T-Cu (mg/L)	0.1	0.2
T-Hg (mg/L)	0.004	0.008
NH3-N (mg/L)	20	40
T-Ni (mg/L)	0.2	0.4
T-NO3-N (mg/L)	50	100
T-Pb (mg/L)	0.10	0.20
T-P (mg/L)	1.5	3.0
T-Zn (mg/L)	0.2	0.4
T-Cl^- (mg/L)	500	1000

Effluent from CM stations ST-35 and ST-36 shall be directed to the northwest arm of Second Portage Lake and shall not exceed the effluent quality limits presented in Table 3-9, as stipulated in Part D, Section 10 in the water license.

Table 3-9: Effluent Criteria at CM Stations ST-35 and ST-36

Parameter	Maximum Average Concentration	Maximum Allowable Grab Sample Concentration
Arsenic (mg/L)	0.5	1.0
Copper (mg/L)	0.3	0.6
Cyanide (mg/L)	1.0	2.0
Lead (mg/L)	0.2	0.4
Nickel (mg/L)	0.5	1.0
Zinc (mg/L)	0.5	1.0
pH	6.0 to 9.0	6.0 to 9.0
Radium-226 (Bq/L)	0.37	1.11
TSS (mg/L)	15.0	30.0

Prior to the construction of the Tailings Storage Facility, effluent from the Stormwater Management Pond at CM station ST-35 shall be directed to the northwest arm of Second Portage Lake and shall not exceed the effluent quality limits presented in Table 3-10, as stipulated in Part D, Section 21 of the water license.

Table 3-10: Effluent Criteria at CM Station ST-35

Parameter	Maximum Average Concentration	Maximum Allowable Grab Sample Concentration
pH	6.0 to 9.5	6.0 to 9.5
TSS	25 mg/L	50 mg/L
BOD_5	25 mg/L	50 mg/L
Fecal Coliforms	1000 CFU/dl	2000 CFU/dl
Oil and Grease*	15 mg/L and no visible sheen	15 mg/L and no visible sheen
Benzene*	370 µg/L	370 µg/L
Toluene*	2 µg/L	2 µg/L
Ethylbenzene*	90 µg/L	90 µg/L
Lead*	1 µg/L	1 µg/L
Al	1.5 mg/L	3.0 mg/L

* Only if discharge form the Mine Bulk Fuel Storage Facility is directed to the stormwater management pond.

Note: Tables 3-9 and 3-10 both apply to CM station ST-35. There are a few inconsistencies between the tables with respect to the effluent criteria for lead, pH and TSS. In the event these inconsistencies become an issue, the more conservative value for the effluent criteria would apply.

Effluent discharged from CM stations ST-9, ST-10, ST-35, and ST-36 shall be demonstrated to be non-acutely lethal, as stipulate in Part F, Section 24 of the water license. The following are the toxicity tests that must be performed:

- Acute lethality to Rainbow Trout, *Oncorhynchus mykiss* (as per Environment Canada's Environmental Protection Series Biological Test Method EPS/1/RM/13); and
- Acute lethality to the crustacean, *Daphnia magna* (as per Environment Canada's Environmental Protection Series Biological Test Method EPS/1/RM/14).

All water collected within the non-contact water diversion system during operations at CM stations ST-5, ST-6 and ST-7 shall not exceed the effluent quality limits presented in Table 3-11, as stipulated in Part F, Section 4 in the water license.

Table 3-11: TSS Criteria at CM Stations ST-5, ST-6 and ST-7

Parameter	Maximum Average Concentration (mg/L)	Maximum Allowable Grab Sample Concentration (mg/L)
TSS	15	30

3.1.2.3 Tailings Storage Facility and Reclaim Pond; Portage and Vault Waste Rock Storage Facilities

Concurrent reclamation is planned for the TSF during the late operations phase of the mine using non-acid generating ultramafic waste rock. The current cap design includes a sloped surface to promote runoff and catchment devices to capture the runoff from the TSF. Sampling of the TSF cap runoff will be conducted in either ditches or sumps adjacent to the TSF.

The reclaim pond is designed to migrate northward as the TSF fills with tailings and eventually combine with the Portage Attenuation Pond. Samples will be collected from the open water of the reclaim pond or from the reclaim line to the mill. The actual sampling location will be dictated by access to the pond and safety considerations.

At the end of mine life, water in the reclaim pond will be drained to complete the reclamation of the TSF. Reclaim water will be transferred to the Portage Pit or Goose Island Pit Lake, which, at that time, will still be isolated from adjacent open waters by the dewatering dikes. Reclaim water quality will be monitored during operation and may be treated prior to release to the pit lakes. Reclaim water treatment requirements will be evaluated prior to transfer to the pit lakes, and will be based on achieving drinking water quality guidelines within the pit lakes after incorporation of reclaim water. The Goose Island Dike will be breached after reclaim water has been released to the pit lakes and water quality has met Territorial Drinking Water guidelines and all MMER criteria including environmental effects monitoring (EEM) in the receiving environment.

Waste rock from the open pits not used for site development purposes will be trucked to mine waste rock storage facilities (RSF); two RSF areas will be used, one near the Portage and Goose Island pits and another near the Vault pit. The RSF are designed to promote and capture surface water runoff in adjacent ditches or sumps. Near to the end of the Portage pit mining operations, excess waste rock will also be placed within the Portage pit to be submerged during pit re-flooding. Monitoring in these areas is included in the CM water collection system discussed in Section 3.1.2.2.

The following is a list of the various areas where samples for the compliance monitoring program are to be collected:

- Tailings storage facility (ST-11; ST-22);
- Tailings reclaim pond (ST-21); and
- Portage and Vault waste rock storage facility (ST-16; ST-24).

3.1.2.4 Support Facilities

Mine Site

The process plant is designed to be self contained with no discharges to the receiving environment. Runoff from the plant area will be captured in the mill sump(s) located on the northwest edge of the plant area. Excess water not used to satisfy process make-up water requirements will be pumped from the mill sump(s) to the Portage Attenuation Pond during Years 1 to 5 and then to the Goose Island pit in subsequent years. The water in the Portage Attenuation Pond and the Goose Island Pit Lake is monitored as part of the CM water collection system (Section 3.1.2.2).

A rotary biological contactor (RBC) sewage treatment plant is in operation at the Meadowbank mine site. Discharge from the plant is directed to Tear Drop Lake (also referred to as Lake #1 or the stormwater management pond). Water quality monitoring for this facility is included in the CM water collection system.

The landfill will be constructed at the Meadowbank mine within the catchment of the Portage RSF. Only inert waste material consisting of primarily construction and non-organic domestic waste will be disposed of at this facility. Hazardous wastes are stored on site in a waste containment area, and transported annually during the sea lift to an appropriate hazardous waste disposal facility in southern Canada. Further details for these waste facilities can be found in the *Landfill Design and Management Plan (Golder Associates, August 2007)* and the *Hazardous Material Management Plan (August 2007).* Water quality monitoring for the landfill is included in the CM water collection system.

A landfarm will be constructed on site in 2009 to treat petroleum hydrocarbon contaminated soils. The facility will be designed and constructed to direct contact water to a sump area, prior to discharge to the land. CM station ST-14 will be used to monitor for any potential contaminants in the sump area.

A 5.6 million litre bulk fuel storage tank will be constructed at the Meadowbank mine site in 2008. Runoff water from within the containment area will be collected in a sump sited within the tank's secondary containment. Water collected in the sump will be discharged in a controlled manner to the land. Effluent from the fuel containment facilities being discharged to land shall not exceed the effluent quality limits presented in Table 3-12, as stipulated in Part F, Section 6 of the water license.

Table 3-12: Effluent Criteria from the Bulk Fuel Containment Facilities Discharged to Land

Parameter	Maximum Average Concentration
Benzene (ug/L)	370
Toluene (ug/L)	2
Ethylbenzene (ug/L)	90
Lead (ug/L)	1
Oil and Grease (mg/L)	15 and no visible sheen

Baker Lake Marshalling Area

The design of the marshalling area includes two monitoring storage ponds located at the southwest and southeast corner of the marshalling area to collect site precipitation runoff. These two ponds are designated as CM stations ST-38 and ST-39 and are to be used as the monitoring points for this facility.

Surface water runoff from the bulk fuel tank storage area will be collected in a sump within the tank's secondary containment system; this containment system is designed to capture precipitation runoff falling within the secondary containment and to contain petroleum products released due to spill events. Water collected in the secondary containment sump at CM station ST-40 will be released in a controlled manner to the east monitoring storage pond.

Runoff from the explosive storage area will be conveyed to the west monitoring storage pond. Water quality of all contact water surface runoff from the ammonium nitrate storage area and from other constructed facilites in the Baker Lake facilites will be monitored at water sample locations in close proximity to the facilites. Water quality will be measured at the explosive storage area, ammonium nitrate storage area and construction facilities at CM stations ST-42, ST-41 and ST-37, respectively.

All effluent being discharged from the constructed facilities at the Baker Lake marshalling facility, including the marshalling area bulk fuel storage facility, ammonia storage and explosives storage and general marshalling area at CM stations ST-38 through ST-42 shall not exceed the effluent quality limits presented in Table 3-13, as stipulated in Part F, Section 23 of the water license.

Table 3-13: Effluent Criteria at CM Stations ST-38 to ST-42

Parameter	Maximum Average Concentration	Maximum Concentration of Any Single Grab Sample
pH	6.0 – 9.5	6.0 – 9.5
Total Arsenic (mg/L)	* *0.5	1.00
Total Copper (mg/L)	**0.30	0.60
Total Lead (mg/L)	*0.05	0.10
Total Nickel (mg/L)	**0.50	1.00
Total Zinc (mg/L)	*0.50	1.00
TSS (mg/L)	* 15.0	30.0
Ammonia (mg/L)	6.0	6.0
Total Cyanide	*0.1	0.2
Benzene (ug/L)	370	370
Toluene (ug/l)	2	2
Ethylbenzene (ug/L)	90	90
Lead (ug/L)	1	1
Oil and Grease (mg/L)	5.0 and no visible sheen	5.0 and no visible sheen

* Environmental Guideline for Industrial Waste Discharges, 2004

** Metal Mines Effluent Regulations (MMER)

3.1.2.5 All Weather Private Access Road (AWPAR) and Quarries

The AWPAR extends 115 km between the Hamlet of Baker Lake and the Meadowbank Project site. Twenty two (22) quarries along the AWPAR were used to construct the road; some of these quarries will remain open for the duration of the mine life to service the road. There are also 2 quarries at Meadowbank mine on either side of the airstrip to provide rock fill for the mine site roads and building pads. Monitoring procedures along the AWPAR and quarries include visual inspections of infrastructure and water quality sampling.

<u>Visual Inspections</u>

The watercourse crossings along the access road are to be visually inspected on a regular basis to confirm their structural integrity, to confirm soil and permafrost stability, to confirm that the crossings have been located adequately with respect to the watercourse, and to confirm that there is minimal impact to fish habitat. This involves two aspects:

- An erosion inspection program to monitor erosion and sediment transport at the channel crossings; and
- A crossing inspection and maintenance program to confirm the structural integrity and stability and adequate location selection of the crossings structure.

The habitat compensation monitoring program for fish-bearing watercourse crossings is described in the Aquatics Effects Management Program (AEMP). This monitoring program includes detailed habitat compensation sampling and contingency measures.

The watercourse crossings erosion inspection program has two main objectives:

- a regular inspection program to confirm that no significant downstream sediment transport is occurring due to erosion of the channel bed or scour around the crossings structure during spring freshet and the ice-free period; and
- an event inspection program to track the impacts of large storm events on sediment transport during the ice-free period.

Table 3-14 summarizes the watercourse crossings regular and event inspection schedule during freshet and the remainder of the ice free period. Results are to be recorded regularly and reported in the annual report to the NWB. Remediation of any detected problems is to be undertaken as soon as possible.

Table 3-14: Water Crossings Regular and Event Based Erosion Inspection Schedule

Regular Inspection Schedule		Event Inspection Schedule
Mid-May through June	July through October	Following large storm events
Twice weekly	Weekly	As required

The watercourse crossing inspection and maintenance program has three main objectives:

- a regular inspection program to identify issues relating to watercourse crossings structural integrity and hydraulic function; regular inspection activities for each watercourse crossing should consist of:
  - Visual inspection of its infrastructure to identify defects, cracks or any other risks to structural integrity. Particular attention will be paid to the inlet and outlet structures of culverts, and to bridge abutments and their foundations, as required.
  - Visual inspection to identify sediment or other debris accumulation impeding the free flow of water through the crossings. Maintenance operations will consist of hand removal of accumulated debris and repairing damages as soon as possible.
  - Visual inspection of upstream and downstream channel to identify bed erosion or scour around the watercourse crossing structure. Particular attention is to be paid to bridge abutments and abutment foundations as they are vulnerable to scour and erosion.
- an event inspection program to track the impacts of heavy or prolonged rainfall storm events on watercourse crossings structural integrity and hydraulic function; and
- a culvert location inspection program to ensure culvert crossings have been installed in the adequate location with respect to the watercourse; this should be completed at the first spring freshet period. Additional culverts are to be installed, if necessary, should the inspection indicate that the culverts were installed in a location that does not optimally route watercourse flows.

Table 3-15 summarizes the watercourse crossing inspection schedule during freshet and the remainder of the ice-free period. Inspection results are to be recorded and reported in the annual report to the NWB. Remediation of any detected problems is to be undertaken as soon as possible.

Table 3-15: Water Crossing and Culvert Maintenance Inspection Schedule

Water Crossing Inspection			Culvert Inspection
Regular Inspection Schedule		Event Inspection Schedule	Inspection Schedule
Mid-May through June	July through October	Following large storm events	Mid-May through June
Twice weekly	Weekly	As required	Twice weekly, for the first year

Water Quality Monitoring

Rock quarry geochemistry studies were conducted prior to construction. The results indicate that there are not expected to be any adverse water quality issues associated with the quarried rock[1]. In the spring of 2008 (June 22nd thru the 25th), a survey of each road quarry was completed and samples of standing water collected. The location of ponded water in each quarry and predicted drainage directions (if appropriate) were mapped. Each quarry condition was photo documented. Field parameters were measured at each quarry where ponded water was evident; these measurements included: temperature, pH, dissolved oxygen, conductivity and turbidity. The water samples were sent off site to a commercial laboratory for analysis of the following parameters: pH, hardness, conductivity, TSS, oil and grease, sulphate, explosive residues (nitrate and ammonia) and the following total metals: aluminum, arsenic, cadmium, chromium, copper, fluoride, iron, mercury, molybdenum, nickel, lead, selenium, silver, thallium and zinc.

Additionally during 2008, AEM has initiated a program of geological mapping and chip sampling of all exposed quarry faces. The chip samples will be sent off site for geochemical characterization (conventional acid-base accounting testing, total and leachable metals using the BC MEM shake flask extraction procedure). The objective is to further verify that the rock used in road and site construction is not potentially acid generating or a source of significant metal leaching. The results of all quarry sampling will be tabulated and reported as part of the 2008 water license annual report.

In 2008 the road alignment is to be periodically surveyed by the site environmental team for any significant water seeps and/or water ponded in contact with the road. Water samples are being collected at locations where road rock appreciably contacts ponded or flowing surface water, as identified during these visual surveys. The sample locations will be chosen to represent areas where standing water is in regular contact with the road rock fill. Other criteria for selecting a sampling location include: areas of evident rock staining (rust colour particularly) and areas where an accidental spill has previously occurred.

[1] *Geochemical Assessment of Potential Quarry Rock Along the Proposed Mine Access Road, Meadowbank Project Nunavut*, Golder, 2007;

Assessment of the Acid rock Drainage and Metal Leaching Potential of Rock from Potential Quarry Site Pit 6, Meadowbank Project Nunavut, Golder 2007;

Assessment of the Acid Rock Drainage and Metal Leaching Potential of Rock Samples Collected from an Esker along the Tehek Lake Access Road, Meadowbank Project, Nunavut, Golder 2007

In addition, starting in 2008, sampling locations are to be set up both up stream and down stream from the 9 major road stream crossings in order to confirm there are no water quality issues resulting from these crossings or the adjacent road rock fill. Stations are to be sampled on a monthly basis during the 2008 open water season and sent off site to an accredited laboratory (Maxxim Analytics laboratory in Montreal) for analysis of the following parameters: pH, hardness, conductivity, TSS, oil and grease, sulphate, explosive residues (nitrate and ammonia) and the following total metals: aluminum, arsenic, cadmium, chromium, copper, fluoride, iron, mercury, molybdenum, nickel, lead, selenium, silver, thallium and zinc. The results for all access road water quality monitoring will be tabulated and reported as part of the 2008 water license annual report.

Sampling frequency will be re-evaluated after the first year of monitoring following the completion of construction of the AWPAR (2008 ice-free period). If the frequency is revised, the justification for this change is to be provided to the NWB and other interveners for comment.

3.1.2.6 Seeps

Water quality model predictions for drainage water chemistry from the RSF and pit lake water chemistry are based upon laboratory-derived loading rates for many of the influent water sources, scaled to approximate field conditions (*Water Quality Predictions, Golder Associates, August 2007*). Site specific empirical data for seeps from the RSFs, pit walls, and dikes will be used to characterize the hydrochemistry and volumes of seasonal water flows and to calibrate and validate the water quality model.

Water samples are to be collected from discharge points where seeps are found, according to the requirements for CM stations ST-S-1 to TBD (to be determined). The locations may include:

- Seeps at or near the toe of the Portage and Vault RSF;
- Seeps in the faces or at the base of the Goose Island Dike, Bay Zone Dike, East Dike, Central Dike, Vault Dike, and South Camp Dike; and
- Seeps discharging from fractures in open pit walls of the Goose Island, Portage and Vault pits.

In addition, seepage observations are to be characterized and monitored in accordance with Part I, Sections 8 and 15 of the water license, as presented in Table 3-16.

Table 3-16: Seepage Observations and Characterization

Characterization of seepage including: precise location; discharge rates and volumes; respective hazard(s) and consequences and prescribed mitigative measure	Minimum Frequency of Observation
Lake water Seepage Through Dewatering Dikes	Monthly
Seepage (of any kind) Through Central Dike	Monthly
Seepage and Runoff from the Landfill(s)	Quarterly
Subsurface Seepage and Surface Runoff from Waste Rock Piles	Quarterly
Seepage at Pit Wall and Pit Wall Freeze/Thaw and Permafrost Aggradation	Quarterly

3.1.2.7 Groundwater

Groundwater quality data is used to predict the future quality of water that will accumulate in the pits during operation, and to determine baseline groundwater quality underneath the tailings basin (the north arm of Second Portage Lake) before tailing deposition. To this end, groundwater monitoring wells are being installed to sample talik water (unfrozen ground beneath large lakes) in areas where through taliks exist. At these locations wells are being installed in each of the three main lithologies that will be encountered in the Goose Island and Portage pits, namely: Iron Formation (IF), Intermediate Volcanic (IV) and Ultramafic (UM) rock.

The *Groundwater Monitoring Plan (August 2008*) describes specific details of the groundwater well installation and monitoring activities at the Meadowbank Gold Project. The water quality in the groundwater wells, once installed, is to be monitored in accordance with the sampling requirements for CM stations ST-GW-1 to TBD (to be decided).

3.1.2.8 Receiving Environment

Receiving water quality monitoring is discussed in the A*quatic Effects Management Program (AEMP) (October 2005*). Within the AEMP are two monitoring programs: a core monitoring program and a targeted monitoring program.

The core monitoring program includes two arcs of sampling stations that surround each of the mine developments (near field and far field) for early detection of mine-related impacts. The monitoring program is summarized in Table 6.1 of the AEMP; the program includes water quality, sediment chemistry, benthos, periphyton, phytoplankton, and fish monitoring, the parameters to be measured, sampling locations, sampling frequency, sampling methods, and criteria for data evaluation. The targeted studies are limited in scope and intended to address "specific questions related to particular components of mine development during construction and operation." In addition to, or superseding, the monitoring requisites in the AEMP, the water quality samples collected under this program are to be monitored in accordance with the requirements for CM stations ST-AEMP-1 to TBD.

A water quality monitoring program is also defined in the AEMP for discharge events during operations of the Portage and Vault attenuation ponds. During the first 5 years of mine operation, it may be necessary to annually discharge water from the Portage Attenuation Pond to Third Portage Lake and during the later years of mine operations, water may be discharged annually from the Vault Attenuation Pond to Wally Lake). CM stations ST-MMER-1 to TBD stipulate the monitoring requirements for these effluent outfalls. Monitoring locations for the effluent outfall diffusers for Third Portage and Wally lakes are to be located at the edge of the 30-m radius mixing zone either within the AEMP core near-field sampling zones or as separate monitoring locations, depending upon the final location of the diffusers.

3.2 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 (Meadowbank Gold Project Spill Contingency Plan; August 2008); or
- emergencies (Meadowbank Gold Project Emergency Response Plan; August 2007).

The EM program is designed to verify whether contamination of the surface soil and active zone has occurred as a result of an accidental release of a hazardous material, through monitoring of surface runoff following remediation of any release. It is anticipated that owing to the presence of permafrost beneath most of the mine footprint, there will be minimum impact to groundwater. A complete list of hazardous materials expected to be used during operations of the mine is provided in the *Meadowbank Gold Project Hazardous Materials Management Plan* (*August 2007*).

The EM plan will have to be developed on a site specific basis subsequent to a spill, and will consider the type of product spilled, the potential receptors and the potential for any remaining contamination after clean up. The plan will be done in coordination with the Environmental Adviser as described in the *Meadowbank Gold Project Spill Contingency Plan.*

In the event of an accidental release, the water quality of the downstream receptor and possibly upstream of the receiving point, if any, is to be sampled (during the ice-free season) and analyzed. Should the spill have happened over snow cover, water and possibly soil sampling is to take place at the earliest feasible time after thaw to verify if there has been any impact to the receiving water or soil quality. 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 hazardous material released.

EM sampling is to occur following the clean up of a release and the frequency of sampling will depend on the type of material spilled (wet or dry spill), the environment into which the chemical was released (surface water body or soil; frozen or thawed), and the quantity of spill material. The EM program for a particular spill will cease upon obtaining satisfactory analytical results (within 20% of background level, to accommodate for analytical accuracy) from the potentially affected areas.

3.3 ADAPTIVE MANAGEMENT PROGRAM

Results of the water quality monitoring are to be reviewed by the Meadowbank Environmental Advisor and chemical trends of constituents of interest are to be updated on a monthly basis. This will allow early detection of significant changes in water quality. Action plans are then to be implemented to ensure that the environment protection objectives are met.

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

The adaptive management program is divided into two sections, one for parameters with regulated discharge criteria at specific monitoring locations, as specified in the water license and by the Metal Mining Effluent Regulations (MMER). The second section is for measured parameters for which no discharge limits have been identified in the water license.

3.3.1 Adaptive Management Program for Regulated Discharge

3.3.1.1 Trigger Level

A trigger level is a defined concentration of one or more analytes of interest in the water sample that initiates the adaptive management program. In this instance, the trigger level is a specified concentration of a regulated discharge criterion. The trigger level follows a staged progression:

- Stage 1: concentration of one or more chemical constituents that exceed 50% of the water license discharge criteria or MMER limits; and
- Stage 2: concentration of one or more chemical constituents that exceed the water license discharge criteria or MMER limits.

Should the water license or MMER values be different concentrations, the trigger levels are defined as the lower or more conservative water license or MMER value. It is anticipated that over time the stage 1 trigger levels would be developed as site specific concentrations based on normal operating levels.

3.3.1.2 Action Plan

The adaptive management program requires that if one or more of the key monitored parameters exceed the respective trigger level, a staged sequence of responses will follow. Table 3-17 summarizes the staged adaptive action plan for the CM program for regulated discharge. Figure 3-1 is a logic diagram showing the decision path for evaluating analytical results for regulated discharge.

At any time during mine construction, operations, or closure phases, if the water quality of the Vault area non-contact water diversion ditch from Phaser Lake to Turn Lake exceeds the water quality standards, water in the non-contact water diversion ditch will be pumped to the Vault Attenuation Pond until the cause of the exceedence can be identified and the situation rectified.

Should the TSS value (calculated from turbidity measurements) of non-contact water at any time during the construction, operation, or closure phases at the Portage mining area exceed regulatory guidelines, the water will be discharged to the Portage Attenuation Pond or TSF until the cause of the exceedence can be identified and the situation rectified.

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;
- Addition of a coagulant for the reduction of TSS in pond water;
- Use of geotextile containers to filter and reduce TSS in pond 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;
- Injection of oxygen for the reduction of ammonia;
- Addition of lime to increase a low pH value or reduce metal concentrations; and/or
- Removal of the offending source rock or the prevention of surface waters coming into contact with the offending source rock.

Table 3-17: Action Plan for Regulated Discharge

Stage	Trigger	Action plan
Stage 1	50% water license discharge criteria or MMER	• QA/QC review and analysis, and re-sample water at the particular location if necessary • notification of mine management (General Mine Manager and Senior Environmental Coordinator) • initiation of an investigation to identify possible source(s) and cause(s) of elevated parameter • initiation of corrective action, if required

Stage 2	Exceeds water license discharge criteria or MMER	• suspension of discharge activities • QA/QC review and analysis, and re-sample water at the particular location if necessary • notification of mine management (General Mine Manager and Senior Environmental Coordinator) and the Nunavut Water Board, the INAC Water Resources water license inspector and the Kivalliq Inuit Association • investigation to identify possible source(s) and cause(s) of the exceedence • initiation of corrective actions or water treatment, and follow up monitoring • resumption of discharge when concentrations are below the discharge criteria

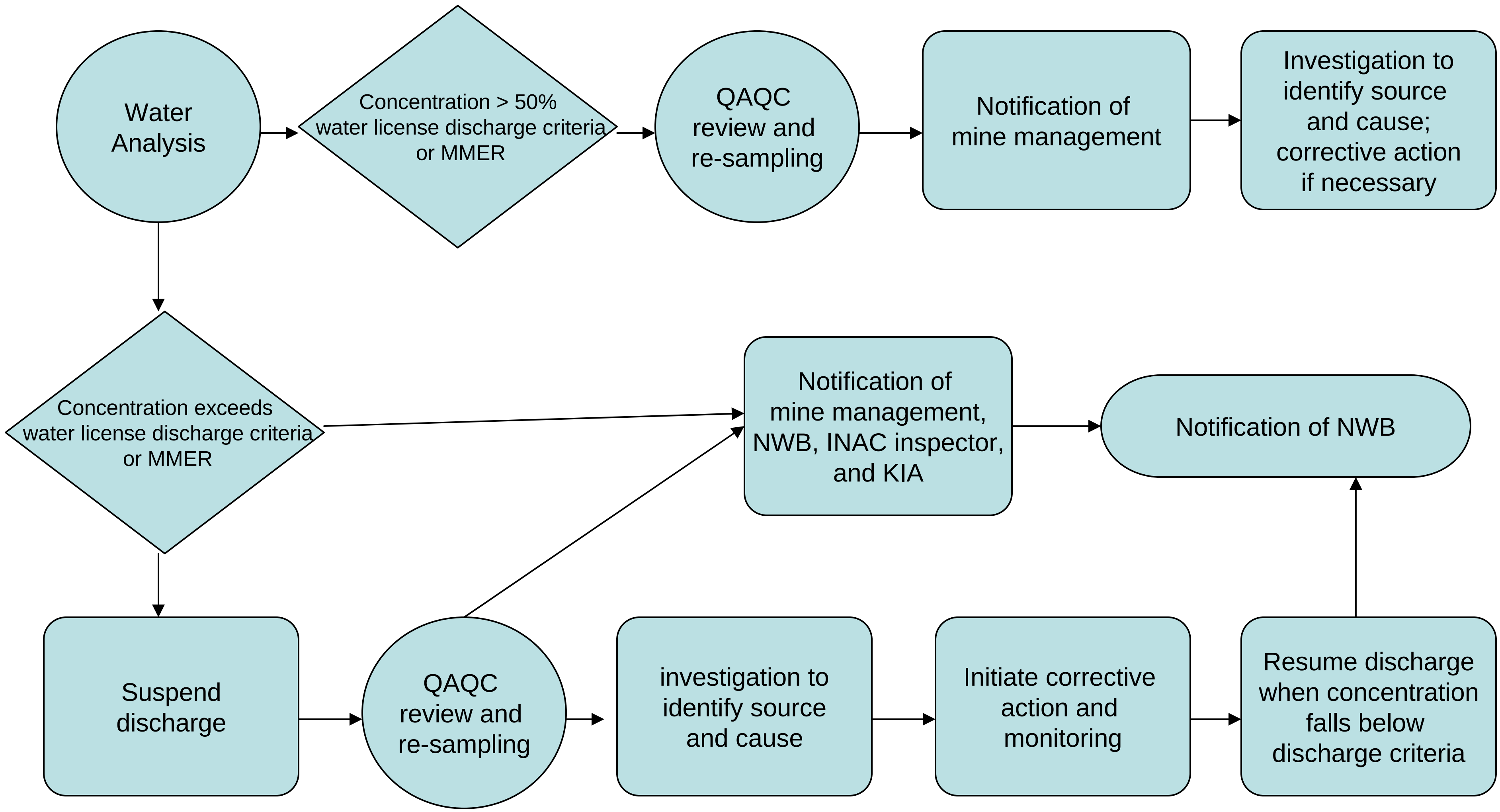

Figure 3-1: Logic Diagram for Regulated Discharge

3.3.2 Adaptive Management Program for Non-Regulated Discharge

3.3.2.1 Trigger Level

Many of the CM locations do not discharge directly to the receiving environment. Consequently, the measured parameters may or may not have discharge criteria specified in the water license. Trigger levels for non-regulated discharge are defined as 10 times (an order of magnitude) higher than:

- Background values for that location; either historic or current (upstream), as appropriate;
- Canadian Council for Ministers of the Environment (CCME) water quality guidelines for freshwater aquatic life; and/or
- Predicted “possible poor end” concentrations for one or more of the MMER parameters.

Table 3-17 lists the arithmetic mean of predicted concentration parameters based on “possible poor end” simulations developed for the Meadowbank site (*Golder Associates Ltd, Water Quality Predictions, August 2007*). The “possible poor end” model results have been adopted for the adaptive management plan trigger levels because these concentrations have been used to assess environmental impacts associated with mining activities and they represent the potential end member concentrations within the model results.

The average model predicted “possible poor end” water quality is the arithmetic mean of concentrations for a given parameter over the years for which the model simulations were conducted, for each phase of the mine life. The time intervals over which the arithmetic mean was calculated are shown in Table 3-18 for each predicted monitoring site.

Table 3-18: Predicted "Possible Poor End" Water Quality Concentrations*

Monitoring Site	Modelled Years	As	pH	Cu	CN	Ni	Pb	Zn
Units		**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
MMER Guidelines		**0.5**	**6.0-9.5**	**0.3**	**1**	**0.5**	**0.2**	**0.5**
Portage Attenuation Pond	1-5	0.022	6.0	0.0038	-	0.0246	0.0021	0.0337
Portage RSF	1-5	0.308	5.3	0.0202	-	0.1236	0.0082	0.1086
North Portage Pit Sump	3-4	0.049	6.1	0.0057	-	0.0342	0.0023	0.0296
Third Portage Pit Sump	1-4	0.045	6.1	0.0103	-	0.0583	0.0052	0.0548
Goose Island Pit Sump	2-3	0.002	6.1	0.0010	-	0.0020	0.0011	0.0052
Tailings Reclaim Pond	1-4	0.035	8.0	0.5439	22.43	0.0594	0.0029	0.0592
Vault Attenuation Pond	4-8	0.011	6.6	0.0014	-	0.0008	0.0001	0.0022
Goose Island Pit Lake	5-8	0.010	6.7	0.0014	-	0.0053	0.0008	0.0074
Portage Pit Lake	5-8	0.010	6.7	0.0031	-	0.0153	0.0012	0.0246
Vault RSF	5-8	0.080	8.0	0.0012	-	0.0002	0.000017	0.0008
Vault Pit Sump	5-7	0.088	8.0	0.0013	-	0.0002	0.000019	0.0009
Tailings Reclaim Pond	5-8	0.060	8.0	0.1561	1.01	0.1169	0.0028	0.0761
Portage RSF	6-8	1.248	5.3	0.0710	-	0.4337	0.0289	0.3832
Vault RSF	9-13	0.221	8.0	0.0032	-	0.0005	0.000476	0.0022
Vault Pit Lake (flooding)	8-13	0.018	6.8	0.0007	-	0.0005	0.0002	0.0023
Goose Island Pit Lake(flooding)	9-13	0.009	6.7	0.0013	-	0.0049	0.0007	0.0070
Portage Pit Lake(flooding)	9-13	0.013	6.7	0.0036	-	0.0177	0.0013	0.0337
Portage RSF	9-13	1.248	5.3	0.0710	-	0.4337	0.0289	0.3832

** source – Golder Associates Ltd., Water Quality Predictions, August 2007*

3.3.2.2 Action Plan

The adaptive management program requires that if one or more of the key monitored parameters exceed the respective trigger level, a staged sequence of responses will follow. Figure 3-2 is a logic diagram showing the decision path for evaluating analytical results for non-regulated discharge. Possible mitigative measures to reduce or treat contaminants are provided in Section 3.3.1.2. The staged sequence of responses for triggered parameters is summarized below.

- Perform a QA/QC review of the validity of the analysis, including a review of the sampling procedures, chain of custody documentation, laboratory analytical procedure and QA/QC data. If necessary, take a second water sample at the particular location to confirm the analytical results.

- Initiate supplemental water quality sampling down stream of the location to quantify the extent of the exceedence and impacts of the exceedence on water quality.

- Increase the sampling frequency at the particular location to document the long term trends in water chemistry.

- Initiate an investigation to identify the source(s) and cause(s) of the exceedence.

- If the exceedence is correct (i.e., not a false positive), persists over several sampling events regardless of corrective action, and impacts the downstream water quality, either a) a corrective action plan must be designed and mitigation measures initiated or b) if no remediation technology is available, the geochemical predictive model for the facility must be re-run using the new parameters as input to the model to assess the long term impacts of the exceedence.

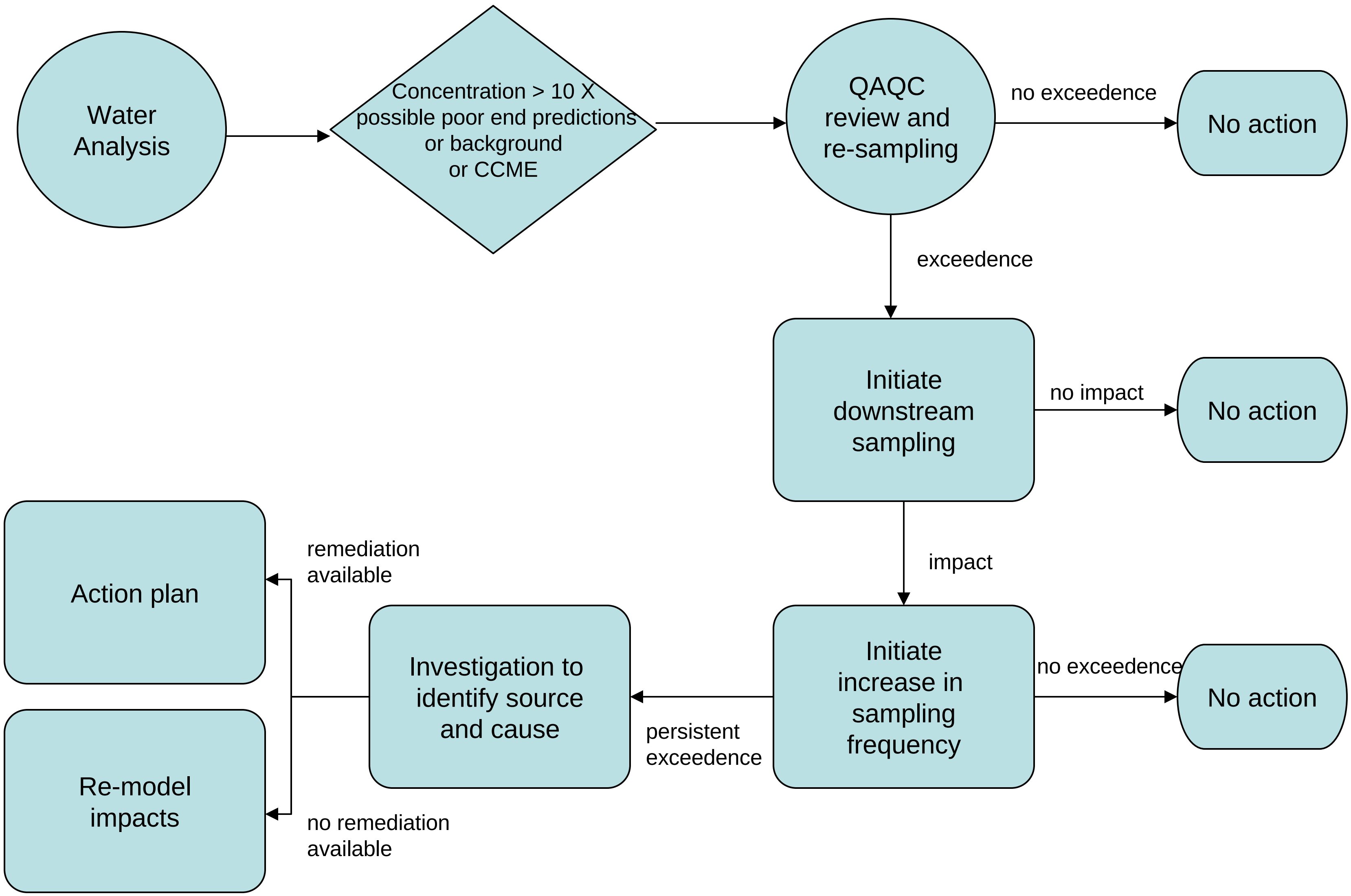

Figure 3-2: Logic Diagram for Non-Regulated Discharge

SECTION 4 • QA/QC PROGRAM

The QA/QC program is designed to identify and minimize the impacts of potential sampling and analytical errors in the monitoring program. The QA/QC program adheres to principles outlined by Indian and Northern Affairs Canada for A-licence water quality monitoring (*Quality Assurance and Quality Control Guidelines for Use by Class A licensees in Meeting SNP Requirements and for the Submission of a QAQC Plan, July 1996*) and is based upon an industry standard frequency and includes the use of sample duplicates and blanks.

It is recommended that one 1 field duplicate, 1 trip blank and 1 filter blank be used for a) each 10 samples; or b) each sampling event as shown in Table 4-1.

Table 4-1: QA/QC Sampling Frequency

Sampling Site	QA/QC Sampling Frequency
CM Program	
Attenuation ponds	One field duplicate, 1 trip blank and 1 filter blank per month during open water season
Mine facilities - operations	One field duplicate, 1 trip blank and 1 filter blank biannually
Mine facilities - closure	One field duplicate, 1 trip blank and 1 filter blank biannually
Mine facilities - post-closure	One field duplicate, 1 trip blank and one filter blank per year
Seep water chemistry	One field duplicate, 1 trip blank and 1 filter blank per 10 samples
Groundwater chemistry	One field duplicate, 1 trip blank and 1 filter blank per groundwater sampling event
Receiving water chemistry	Blind field duplicates, laboratory and field blanks, swipes, matrix spike duplicates per 10 samples (AEMP)
EM Program	
Each event	One field duplicate per 10 samples

In addition, the following will be adhered to:

- All sampling programs will be overseen and reviewed by a qualified Professional as appropriate;
- All sampling, sample preservation and analyses shall be conducted in accordance with methods prescribed in the current edition of *Standard Methods for the Examination of Water and Wastewater*, or by such other methods approved by the Board; and
- All analyses shall be performed in a laboratory accredited according to ISO/IEC Standard 17025. The accreditation shall be current and in good standing.

4.1 SURFACE WATER SAMPLING

Stream and surface water sampling will follow INAC recommended methods of submerging the sample bottle to half depth of the stream, or for sumps and stagnant water bodies, to below the surface of the water. Bottles will be rinsed three times with sample water before filling. Preservatives, when required, will be added after filling. Field blanks and duplicates will be collected in the same manner, and concurrently with the other samples. All water samples will be identified with the station number, time and date of collection and initials of the sampler.

4.2 GROUNDWATER SAMPLING

The sampling procedures for groundwater will be the same as previously employed to sample the existing wells (refer to: *Golder Associates Ltd., 2006 Baseline Groundwater Quality report, August 2007*). All of the wells will be purged, to remove standing water inside the wells and provide a representative sample of fresh rock formation water for sampling. Groundwater will be purged from the wells until electrical conductivity and pH readings stabilize (values remaining within 10% for three consecutive readings). Groundwater will be sampled immediately after each well has been purged. Water samples will be collected using guideline procedures provided by the United States Environmental Protection Agency (*Groundwater Sampling Guidelines for Superfund and RCRA Project Managers, EPA 542-S-02-001, 2002*). Indicator parameters (conductivity, pH) will be measured during purging and sampling. Groundwater samples will be collected in clean, laboratory-supplied containers. Where required, preservatives will be added to the sample bottles prior to sample collection, to minimize chemical alteration during transport to the laboratory. Samples will be filtered through a 45 μm inline filter for the analysis of dissolved metals. All groundwater samples will be stored at or close to 4^{o}C and preserved as specified by the laboratory.

4.3 SAMPLE TRANSPORTATION

All water samples will be stored in coolers with ice packs and preserved as specified by the laboratory. Samples will be shipped to an accredited laboratory as soon as sampling is completed. All samples will be listed on a Chain-of-custody form, a copy of which will travel with the samples and another copy will remain at the mine site for reference. The Chain-of-custody will contain the following information:

- Company name and sampler's name;
- Sample identification number;
- Time and date of sampling;
- Presence and type of preservative and whether the sample was filtered or not;
- Requested analytical parameters for each bottle;
- Time and date of shipping; and
- Analytical laboratory address and contact person.

4.4 DATA VERIFICATION

Upon reception of analytical results, the blank and duplicate analyses will be verified for potential contamination and for accuracy, respectively. Relative percent differences (RPDs) will be calculated for each duplicate pair of analyses and results will be compared against USEPA Guidelines for Inorganic Data Review (1994) which suggests RPD values should not exceed 20% for accurate analyses. All QA/QC data will be reported along with analytical results.

SECTION 5 • FLOW VOLUMES

Flow volumes within the mine footprint will be measured daily during periods of discharge. Flow volume measurements will be conducted using volumetric flow meters attached to each pump. For permanent pumping arrangements, these flows will be measured using permanent in-line flow meters, such as fresh and reclaim water pumping systems. For periodic batch discharges, such as from the landfarm, landfill or secondary containment sumps, portable flow meters will be used. In seepage collection ditches flows may have to be measured using either flow measuring weirs or using stream gauging methods.

Detailed pump records will be maintained including date, pond/sump number, recipient of pumped water, pump ID, flow meter ID, duration of pumping, and total volume pumped. The average flow rates, total discharge per event and total cumulative discharge will be reported annually.

The monitoring locations for water flow volumes, in accordance with Part I, Section 10, and Table 2 of the water license, include:

- The volume of water obtained from Third Portage Lake (CM stations ST-1; ST-27; ST-28);
- The volume of reclaim water obtained from the TSF for process water (ST-4);
- The volume of water for the emulsion plant (ST-3);
- The volume of water from the reclaim pond (ST-2);
- The volume of water discharged from the Portage Attenuation Pond (ST-9) to Third Portage Lake diffuser and Vault Attenuation Pond (ST-10) to Wally Lake diffuser;
- The flow during periods of discharge from the landfarm (ST-14), landfills, waste rock storage facilities, sewage treatment plant, contact water collection system (ST-35; ST-36; ST-38;ST-39) and area sumps (ST-17; ST-19; ST-20; ST-23) collecting contact water;
- The volume of water transferred from the marshalling area bulk fuel storage facility to the east contact water pond; and
- The volume of effluent transferred to the pit lakes.

The pumped intervals for contact water at the Meadowbank Project site are listed in Table 5-1 below.

Table 5-1: Pumped Intervals for Surface Water at the Meadowbank Project, Mine Operation Period

Pumped from	Pumped to
Process Plant (Years 1 to 8)	TSF
Reclaim Pond (Years 1 to 8)	Process Plant
Reclaim Pond (Year 8)	Portage Pit Lake or Goose Island Pit Lake
Portage RSF sumps (Years 1 to 5)	Portage Attenuation Pond
Portage RSF sumps (Years 5+)	Reclaim Pond
Mill sump(s) (Years 1 to 5)	Portage Attenuation Pond
Mill sump(s) (Years 5+)	Goose Island Pit Lake
Portage Pit sump(s) (Years 1 to 5)	Portage Attenuation Pond
Goose Island pit sump(s) (Years 1 to 4)	Portage Attenuation Pond
Vault RSF sumps (Years 4 to 8)	Vault Attenuation Pond
Vault Pit sump(s) (Years 4 to 8)	Vault Attenuation Pond
Portage Attenuation Pond (Years 1 to 5)	Third Portage Lake
Vault Attenuation Pond (Year 4 to 8)	Wally Lake

SECTION 6 • 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 MMER requirements and b) in response to exceedences.

6.1 ANNUAL REPORTING

All water quality monitoring results are to be compiled into a brief monthly report, and sent to the Nunavut Water Board (NWB), the INAC Water License Inspector and to the Kivalliq Inuit Association (KIA). These reports are due within 30 days of the end of the month being reported on.

An annual report is to be submitted to the NWB, KIA, Department of Fisheries and Oceans, Indian and Northern Affairs, 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 exceedences at stations, the action plan applied to the exceedence, 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;
- Annual groundwater monitoring results; activities during the year at each well site and record of well operations, well replacement, and proposed drilling for the next year; and installation details of new wells and identification of any abandoned or destroyed wells.
- Receiving water monitoring results (AEMP);
- Spills and any accidental releases; event monitoring activities conducted following containment, remediation, and reclamation; and the results of EM program, any exceedence in EM results, and the action plan following the exceedence;
- Measured flow volumes;
- Effluent flow rates, volumes and calculated chemical loadings following the requirements of MMER;
- Results of QA/QC analytical data; and
- Any sampling and analyses conducted at the Meadowbank Gold Project site required under MMER or the water license.

6.2 EXCEEDENCE REPORTING

Any measured concentration at a CM station exceeding a regulated discharge criterion stipulated in the water license or MMER will be reported within 30 days of the 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.

Concentrations of a monitored parameter that does not have a regulated discharge criterion, but that exceeds the background value, CCME guideline or predicted “possible poor end” water quality concentrations, will be reported upon receipt of the analysis to the On-Scene Coordinator, the Environmental Advisor, General Mine Manager and the Meadowbank Mine Management, as described in the *Meadowbank Gold Project Spill Contingency Plan* (*August 2007*).

The presence of tailings process reagents or explosives in the groundwater samples will be reported within 30 days of the receipt of the analysis.

Exceedence in the concentration of a parameter in receiving water will be reported as specified in the AEMP.