MELIADINE GOLD PROJECT

WATER MANAGEMENT PLAN

August 2010

DOCUMENT CONTROL

Version	Date (YMD)	Section	Page	Revision
1	10/08/25			The 2007 Plan and 2009 addendums were consolidated and updated to include recent license amendments.

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1.0 Introduction

The **Water Management Plan** pertains to Nunavut Water Board License No. 2BB-MEL0914 issued to Comaplex Minerals Corp. for the Meliadine Gold Project. The Project was purchased by Agnico-Eagle Mines Limited (AEM) in early July 2010. This Plan addresses water use and waste disposal, geotechnical drilling within 31 metres of water, and exploration activities on the property including ongoing surface diamond drilling and the extension of the underground exploration/bulk sample program. This update is in response to a July 8, 2010 letter from the Nunavut Water Board.

2.0 Plan Objectives

The purpose and objectives of this plan include the following:

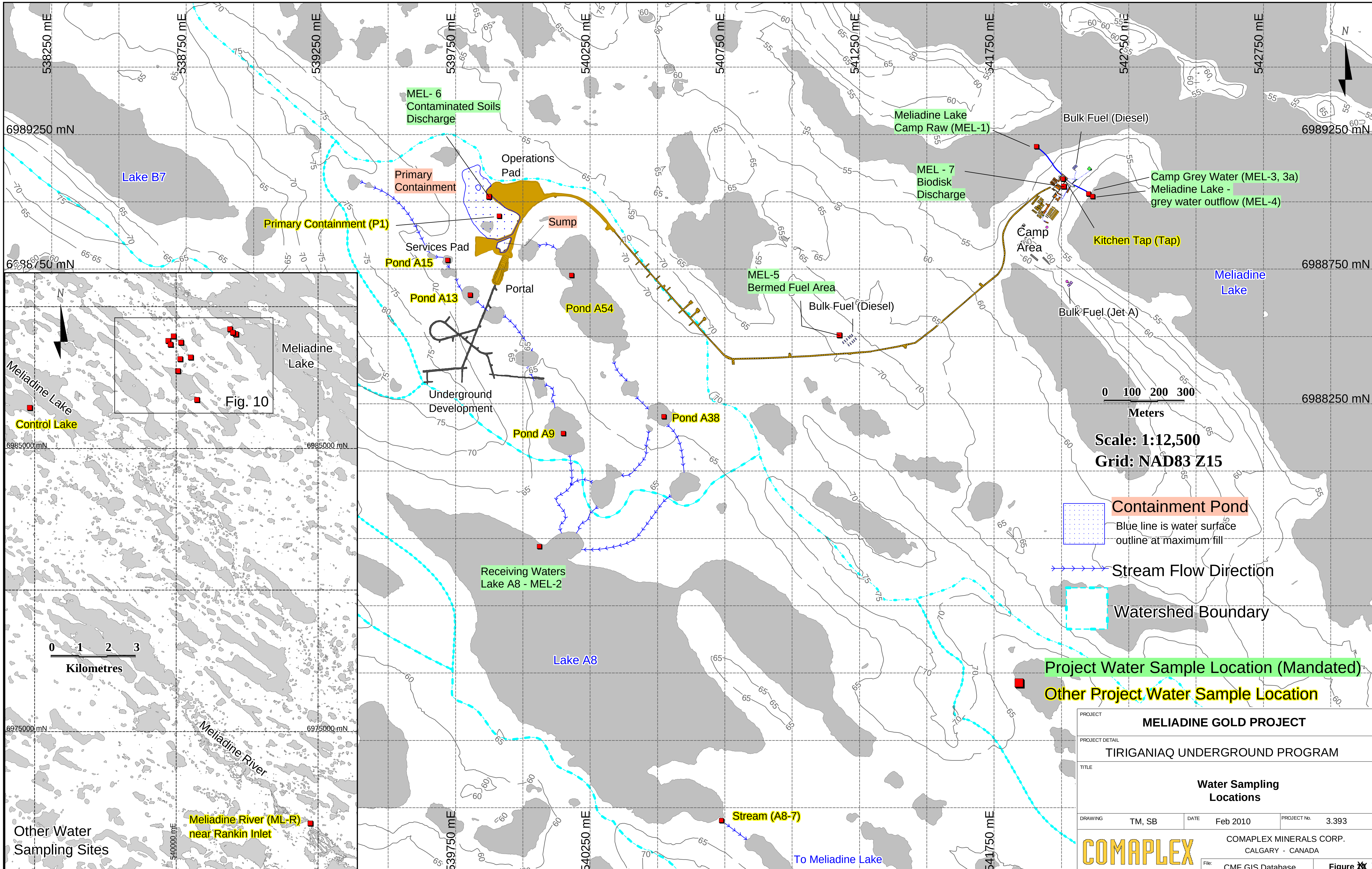
- to monitor specified water quality parameters at the camp domestic water intake and gray water outlet;
- to monitor the performance of the BIODISK Rotating Biological Contactor wastewater treatment plant;
- to monitor the effect of underground operations on the water quality in the primary containment area;
- to contain site runoff from the underground program within a single drainage basin while minimizing the effect on the surrounding terrestrial environment;
- to document the effect of long term storage of waste rock, ore and overburden on the local downstream water quality with an emphasis on trace metals and nutrients;
- to document water use for routine exploration activities such as geotechnical and surface diamond drilling, and also for underground exploration; and
- to report the quantity of water used and the results of water quality monitoring activities.

3.0 Project Overview

The exploration camp has been used for exploration activities since 1997. It is currently supports ongoing surface exploration activities initiated in 1997, geotechnical drilling along the proposed road right-of-way from the site to Rankin Inlet, and in the near future the proposed extension of the underground exploration program.

Table 1 below outlines the monitoring requirements for the 8 monitoring locations specified in Water License 2BB-MEL0914 while figure 1 shows their locations. The camp water is drawn from Meliadine Lake from location Mel-1, which remains unchanged since 1997. Water for the underground exploration program and proximal surface drilling is drawn from Lake A8[1]. Water use for drill sites distant from Lake A8 is drawn from lakes and ponds near the drilling targets. Waste water is sampled at monitoring stations MEL-3, MEL-3a,

[1] Also identified as MEL-2 in the Water License, and Pump Lake in earlier documents.


MEL- 6
Contaminated Soils
Discharge
Operations
Pad
Primary
Containment
Primary Containment (P1)
Sump
Services Pad
Pond A15
Pond A13
Portal
Pond A54
Underground
Development
Pond A9
Pond A38
Receiving Waters
Lake A8 - MEL-2
Lake A8
Lake B7
Stream (A8-7)
To Meliadine Lake
Meliadine Lake
Camp Raw (MEL-1)
Bulk Fuel (Diesel)
MEL - 7
Biodisk
Discharge
Camp Grey Water (MEL-3, 3a)
Meliadine Lake -
grey water outflow (MEL-4)
Kitchen Tap (Tap)
Camp
Area
MEL-5
Bermed Fuel Area
Bulk Fuel (Diesel)
Bulk Fuel (Jet A)
Meliadine
Lake
6989250 mN
6988750 mN
6988250 mN
538250 mE
538750 mE
539250 mE
539750 mE
540250 mE
540750 mE
541250 mE
541750 mE
542250 mE
542750 mE
N
0 100 200 300
Meters
Scale: 1:12,500
Grid: NAD83 Z15
Containment Pond
Blue line is water surface
outline at maximum fill
Stream Flow Direction
Watershed Boundary
Project Water Sample Location (Mandated)
Other Project Water Sample Location
Meliadine
Lake
Fig. 10
Meliadine Lake
Control Lake
6985000 mN
0 1 2 3
Kilometres
Meliadine River
Meliadine River (ML-R)
near Rankin Inlet
6975000 mN
540000 mE
Other Water
Sampling Sites
PROJECT
MELIADINE GOLD PROJECT
PROJECT DETAIL
TIRIGANIAQ UNDERGROUND PROGRAM
TITLE
Water Sampling
Locations
DRAWING TM, SB
DATE Feb 2010
PROJECT No. 3.393
COMAPLEX
COMAPLEX MINERALS CORP.
CALGARY - CANADA
File: CMF GIS Database
Figure 1

MEL-4, and MEL-7. The waste water is discharged on the other side of the peninsula from where the fresh water intake is located as shown on figure 1.

Table 1. Water License Water Quality Monitoring Stations

Monitoring Program Station	Location	Description
MEL-1	Raw water supply intake at Meliadine Lake	The volume of water used by the camp is recorded for this location. The limit is 25 m^3/day.
MEL-2	Raw water supply intake at Pump Lake Active	The volume of water used by the underground program and proximal surface drilling is recorded for this location. The limit is 265 m^3/day.
MEL-3	Immediately downstream of old gray water sump prior to effluent entering wetland area, when flow is observed.	This monitoring location will be phased out once the BIODISK treatment system is fully commissioned At that point, it will receive all waste water from the camp. Samples are analyzed for Biochemical Oxygen Demand – BOD_5, Faecal Coliforms, Total Suspended Solids, pH, and Oil and Grease.
MEL-3a	Immediately downstream of upgraded sump prior to the effluent entering the upgraded wetland area, when flow is observed	This monitoring location will become active once the BIODISK treatment system is fully commissioned and treated water is released to the sump and wetland. Samples will be analysed for the same water quality parameters as listed for MEL-3.
MEL-4	At a point immediately upstream of the discharge from the wetland area / upgraded wetland area to Meliadine Lake	This monitoring location is active in monitoring the quality of the waste water after it has passed through the sump and wetland. Samples will be analyzed for the same water quality parameters as listed for MEL-3 and trace metals, nutrients, major ions and physical parameters.
MEL-5	Point of discharge for the Bermed Fuel Containment Facilities	This monitoring station is presently inactive as there has been no discharge from the lined, bermed area.
MEL-6	Point of discharge for the contaminated soil storage	The monitoring station is inactive. Independent testing of the soil indicates that it is no longer contaminated. The soil meets both Nunavut soil quality guidelines and the CCME Petroleum Hydrocarbon Guideline in Soil for Residential / Parkland. This being the most stringent guideline.
MEL-7	Final effluent discharge from the BIODISK treatment system	This monitoring station is active with samples collected monthly at end of pipe. Samples will be analyzed for the same water quality parameters as listed for MEL-3.

Ablution products from the camp (Pacto) toilets are presently incinerated on site. However, the BIODISK wastewater treatment plant is presently being commissioned, and by the end of the summer of 2010 the incineration of ablution products will cease. However, the Pacto toilets will remain as back-up in the event of the BIODISK experiencing operating problems.

Gray water from the shower, laundry and kitchen is presently discharged to a sump which drains to a wetland before reaching Meliadine Lake. All gray water will report to the BIODISK by the end of the summer of 2010 with the treated water being released to a sump/wetland situated parallel to the existing sump/wetland as shown on figure 2.

4.0 Permits for Exploration and the Camp

AEM maintains the right to explore and carry out diamond drilling on all of its existing leases, claims and NTI concessions through a series of land use permits and licenses as outlined in table 2. Access to these land parcels is typically by helicopter in summer months, but also via overland routes that are licensed for winter access. The scope of the project was changed in 2007 with the initiation of the underground exploration program, which commenced in August of 2007. Water license 2BB-MEL0709 was granted in response to this change in scope and was renewed for 5 years in 2009, license 2BB-MEL0914 . The scope of the project remains unchanged for the proposed 2011-2013 extension of the underground exploration program.

TABLE 2. Permits and Licenses held by the Meliadine Gold Project – July 2010

Type	Permit Number	Issuing Agency	Expiry date
Type B Water License	2BB-MEL0914	Nunavut Water Board	31 Jul 2014
Type B Water License	2BE-MEP0813	Nunavut Water Board	31 Oct 2013
Exploration Land Use License	KVL100B195	Kivalliq Inuit Association	31 Oct 2011
Exploration Land Use License	KVL302C268	Kivalliq Inuit Association	1 Jul 2011
Exploration Land Use License	KVL308C07	Kivalliq Inuit Association	13 Jun 2011
Overland Right-of-Way	KVRW07F02	Kivalliq Inuit Association	26 Oct 2011
Meliadine Lake Right-of-Way	KVRW98F149	Kivalliq Inuit Association	30 April 2011
Commercial Lease	KVCL102J168	Kivalliq Inuit Association	30 Jun 2011
Mainland esker Quarry Permit	KVCA07Q08	Kivalliq Inuit Association	15 Sep 2011
Meliadine Production Lease	KVPL10D02	Kivalliq Inuit Association	To be determined
Permanent Road Quarries Lease	KVCA10Q03	Kivalliq Inuit Association	To be determined
Permanent Road Right-of-Way	KVRW10F04	Kivalliq Inuit Association	To be determined
WCB Program Authorization		Worker's Compensation Board	31 Dec 2010
CWM Claims Drilling Permit	N2007C0041	Indian and Northern Affairs	13 Apr 2011
PB1 – Geotechnical Drilling	N2010C0002	Indian and Northern Affairs	11 Apr 2011
Meliadine Lake Quarry Permit	N2007Q0040	Indian and Northern Affairs	13 Apr 2011
Hamlet Disposal Authorization	Letter of approval	Hamlet of Rankin Inlet	No end date

The extension of the underground exploration program is designed to provide information that will help establish the feasibility of mine development at Meliadine Lake. The program will run from 2011 until mid to late 2013. Table 3 below shows the tonnes and volume of rock brought to surface in 2007 – 2008 and what is expected from the underground extension program 2011-2013. In the table, the volume of loose cubic metres represents broken rock on the surface. Concurrent surface drilling will continue during the underground extension program.

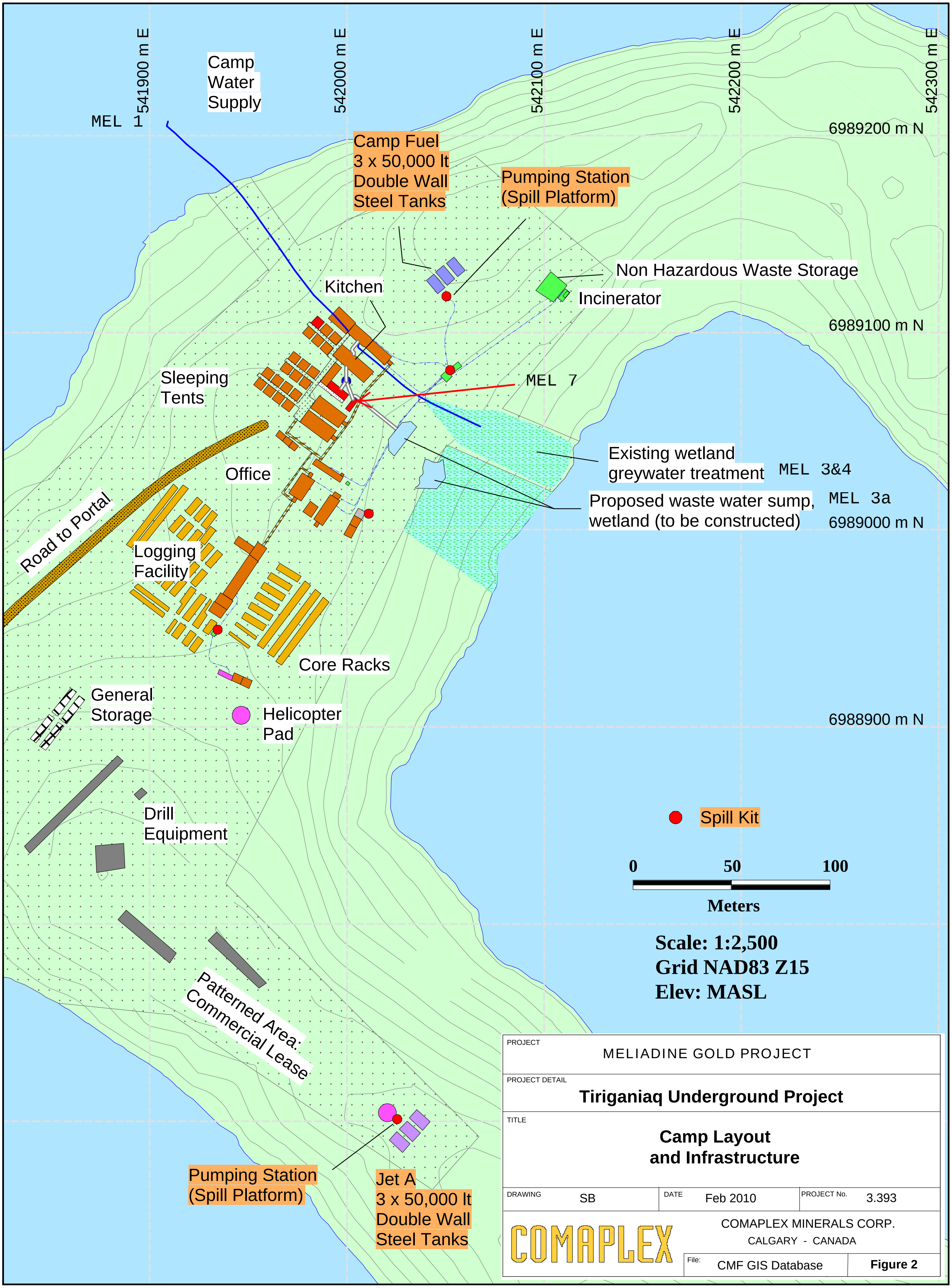

541900 m E
542000 m E
542100 m E
542200 m E
542300 m E
6989200 m N
6989100 m N
6989000 m N
6988900 m N
MEL 1
Camp Water Supply
Camp Fuel 3 x 50,000 lt Double Wall Steel Tanks
Pumping Station (Spill Platform)
Non Hazardous Waste Storage
Incinerator
Kitchen
Sleeping Tents
MEL 7
Existing wetland greywater treatment
MEL 3&4
MEL 3a
Proposed waste water sump, wetland (to be constructed)
Office
Road to Portal
Logging Facility
Core Racks
General Storage
Helicopter Pad
Drill Equipment
Spill Kit
0
50
100
Meters
Scale: 1:2,500
Grid NAD83 Z15
Elev: MASL
Patterned Area: Commercial Lease
Pumping Station (Spill Platform)
Jet A 3 x 50,000 lt Double Wall Steel Tanks
PROJECT
MELIADINE GOLD PROJECT
PROJECT DETAIL
Tiriganiaq Underground Project
TITLE
Camp Layout and Infrastructure
DRAWING SB
DATE Feb 2010
PROJECT No. 3.393
COMAPLEX
COMAPLEX MINERALS CORP.
CALGARY - CANADA
File: CMF GIS Database
Figure 2

Table 3. Underground Exploration Program Waste Rock and Ore

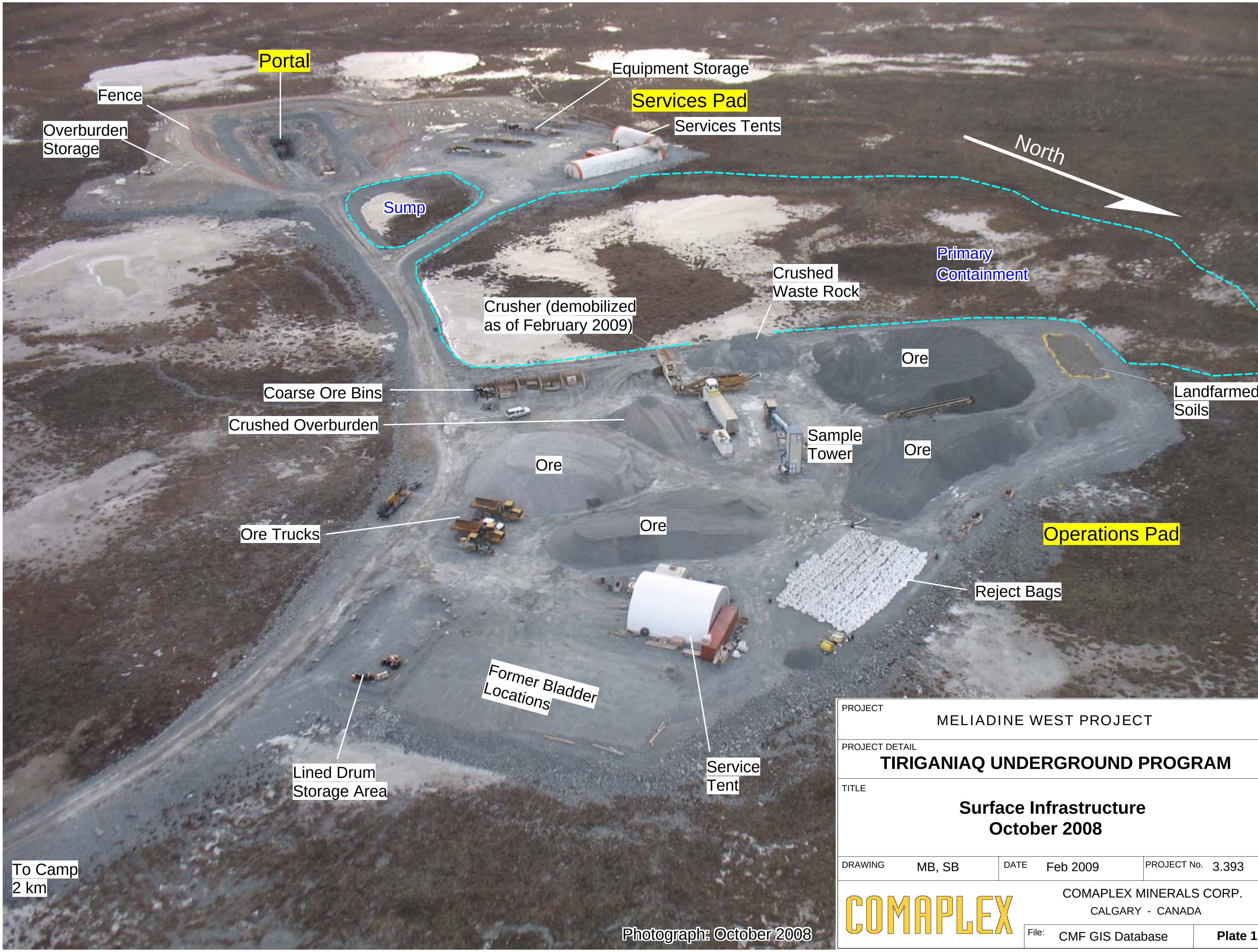
Underground exploration program	2007 - 2008		2011 - 2013	
	tonnes	loose m^3	tonnes	loose m^3
Overburden Portal	25,890	19,417	NA	NA
Waste Rock Portal	17,609	9,435	NA	NA
Waste Rock Decline	82,328	44,105	213,190	114,209
Ore	25,521	13,065	22,156	11,460
Total Rock	125,458	66,605	235,346	125,669

Additions to the existing waste rock pads, as shown in plate 1, will be situated alongside and behind existing primary containment in the same watershed as the first program as shown on figure 3. The rock being extracted is largely identical to that accessed earlier in 2007 – 2008 and poses no acid rock drainage (ARD) risk.

5.0 General Water Management

General code of conduct guidelines for exploration activities with respect to water management have been in place since before AEM took over management of the Meliadine Gold Project. In summary these are:

- there is to be no diamond drilling within 31 m of a natural water body or water course unless authorized to do so;
- there is to be no fuel storage or the handling of fuel vessels within 31 m of a natural water body or water course unless authorized to do so;
- a spill contingency plan is to be implemented for fuel spill prevention and preparedness;
- drill cuttings are to be controlled and contained in depressions near the drill hole. Insta-berms (water filled berms) and/or silt fences are deployed to prevent drill cutting from entering receiving waters;
- for drill holes within 31 metres of water, the drill cuttings will be pumped to a depression at least 31 metres from the water body;
- if necessary, flocculants are to be employed to reduce the Total Suspended Solids in the waste water coming from the drills;
- water is to be recycled at each drill so as to reduce the daily water use per drill from the present 53 m^3;
- drill-sites are to be rehabilitated; and
- when drilling through lake ice is planned, before and after water samples are collected to measure if the lake was impacted by the drilling.



PROJECT	MELIADINE WEST PROJECT
PROJECT DETAIL	**TIRIGANIAQ UNDERGROUND PROGRAM**
TITLE	**Surface Infrastructure October 2008**

DRAWING	MB, SB	DATE	Feb 2009	PROJECT No.	3.393

COMAPLEX

COMAPLEX MINERALS CORP.
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File:	CMF GIS Database	**Plate 1**

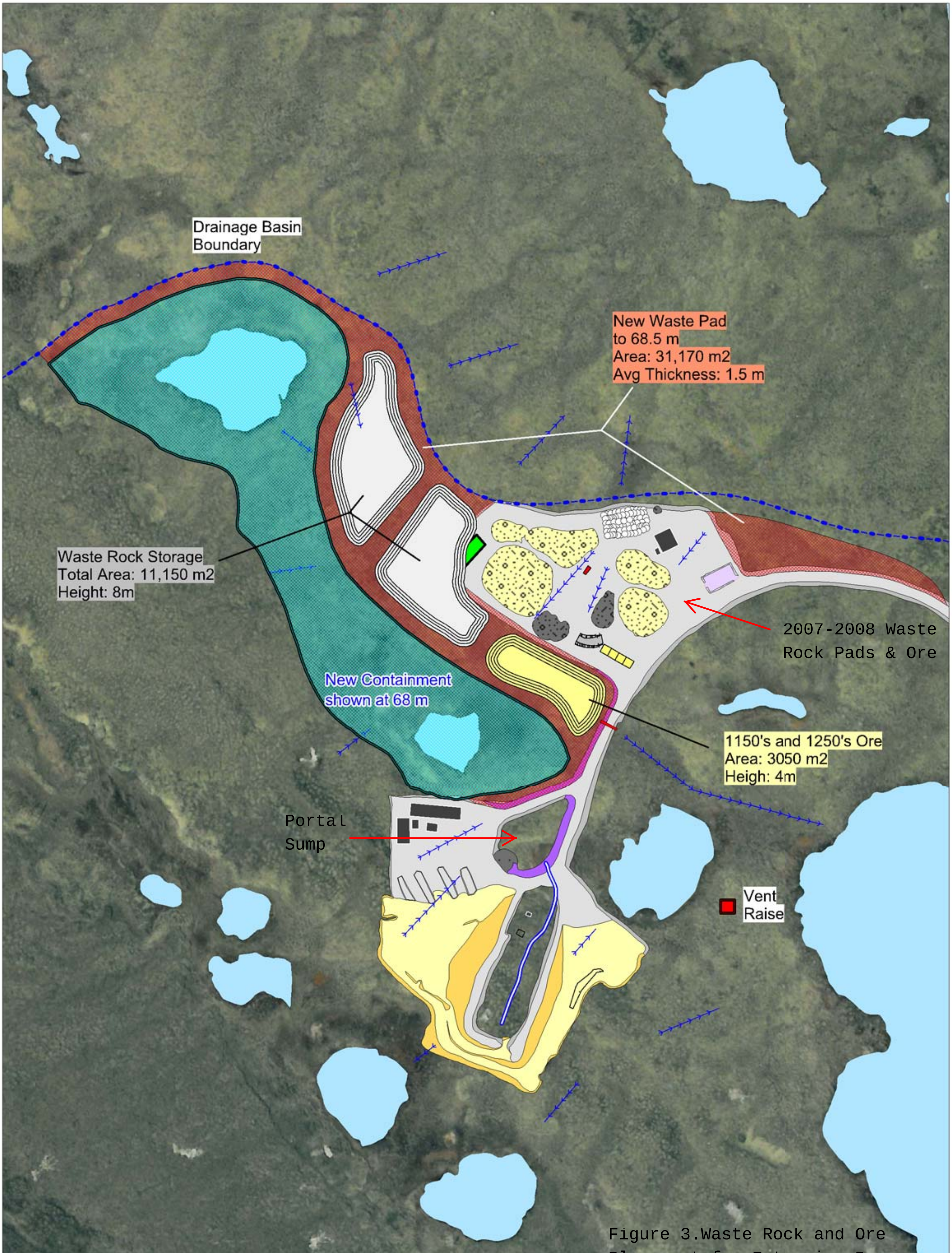


Figure 3.Waste Rock and Ore Placement for Extension Program

6.0 Water Consumption Records

A water meter was installed in the camp to record water consumption in the camp. In 2009, an average of 4.3 m^3/day was used while the camp was in operation. Once the BIODISK treatment system is fully commissioned in 2010 and flush toilets are being used, it is anticipated that approximately 7 to 10 m^3/day of water will be used in camp. This will be confirmed by metering the water used on a daily basis.

The drills operate on a flow through system in order to keep the water lines from freezing. Flow through systems work on the principle that moving water will not freeze. Consequently, water is pumped on a continuous basis and diverted to the mud tanks as required. The water that is not used just passes out the other end of the pipe and back to the same or nearest lake, this being an indirect use of water.

On August 12th, 2009, meters were installed on the drills. It was agreed with the inspector to record water use by the drills until October 1st or the end of the drilling season, whatever came first. The average daily use over the period of record would serve as an average going forward, especially during winter drilling when the recording of water use is not practical. To the end of drilling in mid September 2009, the average water use was 53 m^3/day/drill. Efforts will be made in 2010 forward to reduce the quantity of water used at each drill through the removal of drill cuttings from the drill waste water thereby allowing recycling of the water.

Water use for 2009 is detailed in Table 4. From August 2009 forward, the quantity of water is based on the metered volume.

A water license amendment was granted on 28 June 2009 increasing the allowable water use from 90 m^3/day to 290 m^3/day. This is sufficient water for the camp and 5 drills based on present water use. The camp is allocated 25 m^3 and all other uses such as drilling, 265 m^3.

Table 4. 2009 Water Use

	MEL – 1 Meliadine Lake (m^3/day)	MEL-1 Meliadine Lake (m^3/month)	MEL-2 Lake A8 (Pump) (m^3/day)	Mel -2 Lake A8 (Pump) (m^3/month)
January 2009[1]	1.0	31	-	
February 2009	1.0	28	-	
March 2009	1.5	46.5	-	
April 2009[2]	4.3	129	75	1,050
May 2009	4.3	133.3	75	2,325
June 2009	4.3	129	75	2,250
July 2009	4.3	133.3	75	2,325
August 2009	4.3	133.3	159	4,929
September 2009[3]	4.3	129	159	2,544
October 2009[4]	1.9	9.5	-	
November 2009	-		-	
December 2009	-		-	

[1]An application for an amendment was sent to the NWB on 21 January 2010 asking for an increase in the allowable water from 90m^3/day to 290 m^3/day. This was granted 28 June 2010
[2]Drilling commenced April 16th, 2009. The monthly quantity of water used is for the last 14 days of the month.
[3]Drilling stopped September 16th, 2009. The monthly quantity of water used is for the first 16 days of the month.
[4] The camp was shut down 5 October 2009.

7.0 Camp Water Management

The camp domestic water system has been in use since 1997 and is drawn from Meliadine Lake at pumping station labeled MEL 1 on Figure 1. Four 1400 litre and one 2500 litre plastic tanks are located within the dry/wash facility and in the wash car, respectively. These are filled on a demand basin. The water is used for cooking and cleaning, bathroom sinks, showers, laundry and flush toilets. Kitchen, shower and laundry effluent from the dry area is piped to a sump immediately east of the kitchen / dry facility and allowed to seep through a natural wetland environment (Figure 2, MEL 3) before draining into Meliadine Lake (Figure 2, MEL 4).

By late summer 2010, there will be no gray water discharge from the dry, showers and laundry to the natural wetland environment. All waste water from these facilities will be directed to the BIODISK as the commissioning continues. Discharge of treated water from the BIODISK will flow to a newly constructed sump and wetland to the west of the existing one, (Mel-3a).

The BIODISK sewage treatment system is highly dependent on the growth of bacteria within the system. Because these bacteria react adversely to antibacterial soap, strong detergents and harsh cleaners such as Javex, these are being phased out of use and will be replaced by biodegradable cleaning products.

8.0 Diamond Drilling Water and Sludge Management

AEM will not drill within 31 metres of an open body of water unless authorized to do so. Drill cuttings (ground rock) are not allowed to flow into any body of water through the use of Aquadams and/or silt currents. Once the sludge has settled and TSS removed, the water flows into a natural water course. Presently, a drill uses 53 cubic metres of water each day, this being measured using meters during the late summer of 2009. Five drills can operate simultaneously based on the 265 m^3/day of water allowed under the Water License. In the near future, water recycling measures will be employed to reduce the quantity of water used by the drills.

Quite commonly, the process of drilling creates a depression around the borehole and the sludge is concentrated in and adjacent to that depression. Experience has shown that if the drilling sludge is spread as a thin layer around the hole, the area will re-vegetate completely within a couple of years. If a thick layer of drill sludge is deposited into depressions, re-vegetation is hindered. The present approach to drill site re-habilitation has worked well for the last 15 years.

All efforts are made to stabilize and re-contour the ground upon completion of work. However, the restoration of the drill holes and disturbed areas to natural conditions immediately upon completion of drilling is not possible. Anecdotally, restoration occurs slowly over time with wet areas re-vegetating first and dry sites much later.

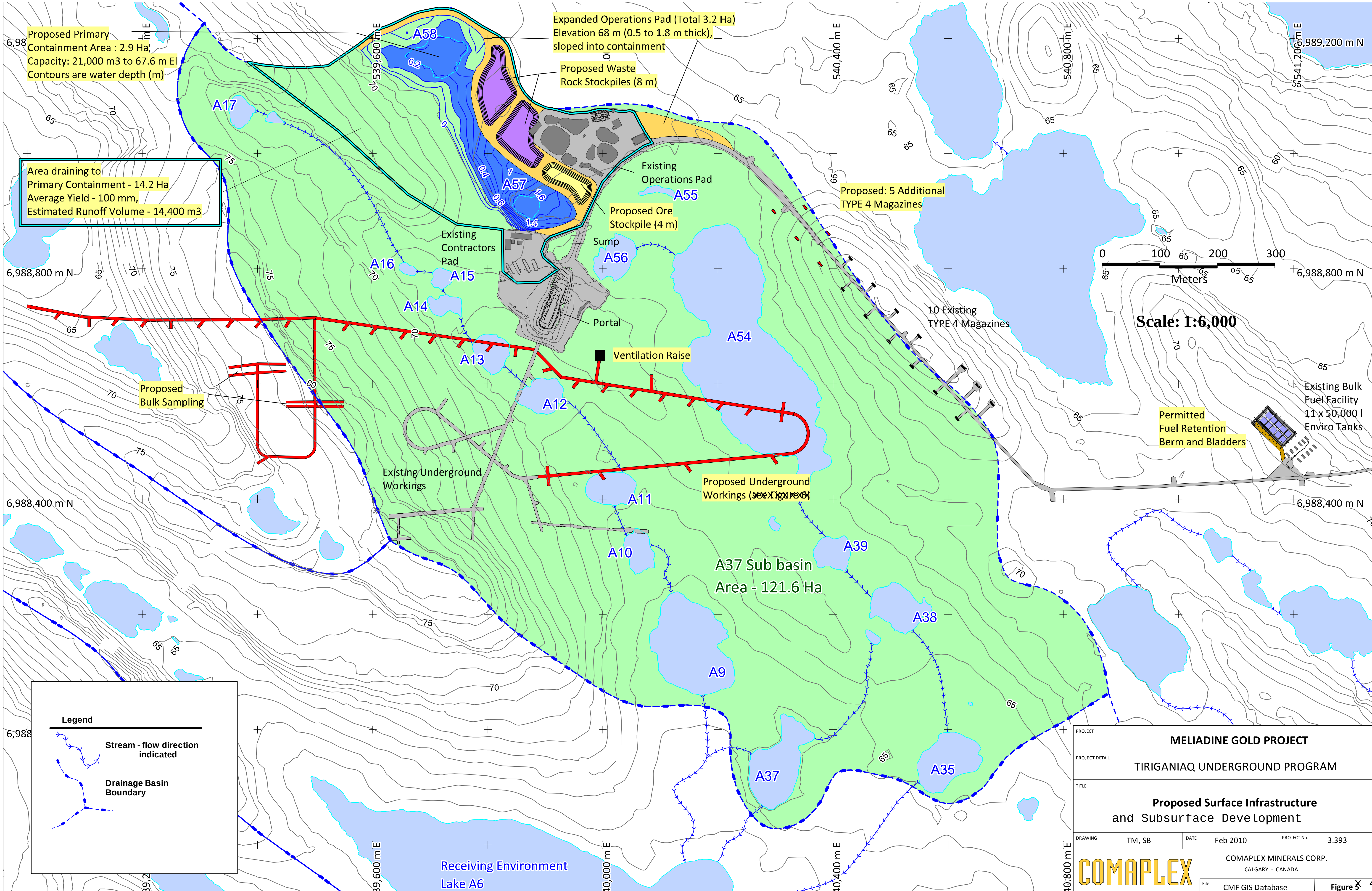
Following the completion in drilling a hole, all attempts are made to pull the casing. Where this is not possible, the casing is cut off at or below surface. Water flowing into the hole or cut off casing will freeze as all drill holes are in areas of permafrost. No drill holes had artesian flow. Some drill holes did, however, penetrate the lower permafrost boundary, which on occasion resulted in water flow part way up the drill stem but not to surface.

9.0 Underground Exploration Site Water Containment Plan

The initial underground exploration site configuration was engineered such that all runoff from the workings, the stored overburden, the waste rock pads, and ore piles on the waste rock pads was directed to the portal sump and primary containment area in 2007 -2008 as shown on figure 3. This was done by grading the surfaces of the waste rock pad and overburden to drain towards the two containment areas. The capacity of the sump near the portal is 2,500 m^3 and the primary containment, 21,000 m^3.

Figure 4 also shows the sub–area of the Lake A54 watershed that contributes runoff to the primary containment area. This sub-area is 142,000 square metres in area. Rounding the expected 97 mm yield to 0.1 metres suggests a yield of 14,200 cubic metres of water each year, mostly from snow melt in the spring. The primary containment area is capable of holding about 21,000 cubic metres of water to the 67.6 m elevation, with a maximum depth of 1.6 metres. Consequently the Primary Containment Area is capable of containing the spring runoff from the sub–area of Lake A54 basin[2]. To lessen the volume of water accumulating in the Primary Containment Area, snow that is cleared out of the ramp leading to the portal and off the pad is placed in basin A54, downstream of the containment areas. Future plans call for building a cover over the ramp leading to the portal. This will eliminate the collection of snow in this location.

[2] Appendix C is Chapter 4 of the 2000 Water Balance Study completed for the project by AMEC Earth and Environmental Ltd. The chapter details how the water balance for sub-basin A54 was determined.


Proposed Primary
Containment Area : 2.9 Ha
Capacity: 21,000 m3 to 67.6 m El
Contours are water depth (m)
Expanded Operations Pad (Total 3.2 Ha)
Elevation 68 m (0.5 to 1.8 m thick),
sloped into containment
Proposed Waste
Rock Stockpiles (8 m)
Area draining to
Primary Containment - 14.2 Ha
Average Yield - 100 mm,
Estimated Runoff Volume - 14,400 m3
Existing
Operations Pad
Proposed Ore
Stockpile (4 m)
Existing
Contractors
Pad
Sump
Portal
Ventilation Raise
Proposed: 5 Additional
TYPE 4 Magazines
10 Existing
TYPE 4 Magazines
Scale: 1:6,000
0 100 200 300
Meters
Existing Bulk
Fuel Facility
11 x 50,000 l
Enviro Tanks
Permitted
Fuel Retention
Berm and Bladders
Proposed
Bulk Sampling
Existing Underground
Workings
Proposed Underground
Workings
A37 Sub basin
Area - 121.6 Ha
A58
A57
A17
A16
A15
A14
A13
A12
A11
A10
A9
A55
A56
A54
A39
A38
A37
A35
Receiving Environment
Lake A6
6,988,800 m N
6,988,400 m N
6,989,200 m N
539,600 m E
540,000 m E
540,400 m E
540,800 m E
541,200 m E
Legend
Stream - flow direction indicated
Drainage Basin Boundary
PROJECT
MELIADINE GOLD PROJECT
PROJECT DETAIL
TIRIGANIAQ UNDERGROUND PROGRAM
TITLE
Proposed Surface Infrastructure
and Subsurface Development
DRAWING
TM, SB
DATE
Feb 2010
PROJECT No.
3.393
COMAPLEX
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CALGARY - CANADA
File:
CMF GIS Database
Figure 5

The north side of the road along the primary containment and the south side of the sump were lined with a woven polypropylene / polyvinyl liner to contain site runoff in late 2007. However, a failure in the liner near a culvert in the primary containment allows the water to trickle downstream to Lake A54 over the summer.

Future plans for the containment area, as part of the extension of the underground program in 2011 - 2013, would see the culvert pulled out of the road and the road widened so as to better hold water in the primary containment area. The extra width and removal of the culvert will assist in holding the water for a longer time period each spring as permafrost is expected to move up into the road bed over the winter and temporarily act as a dam.

Following the repair, decanting of the primary containment area will occur in early spring, after testing the water and receipt of analytical results showing that the Metal Mining Effluent Regulations limits were met. Should the water not meet the MMER limits, the water would continue to be held and, if necessary, treated. This would be followed by re-sampling and testing once more.

Upon receipt of the analytical results showing that the MMER limits are being met, a maximum amount of water would be pumped downstream thereby reducing the water held in the containment area to a minimum. The volume pumped would on average be approximately 18,000 cubic metres, this being a combination of runoff and also water used in the underground.

If a significant volume of water were to be held for an extended period in the containment area, the warmth of the water could thaw the permafrost that moved into the roadbed, and allow water to seep downstream. Periodic pumping of the containment area can be expected to follow summer storms, providing the analysis of the water supports its release.

10.0 Underground Water Management

The underground workings are in permafrost, which is thought to extend 450 m below surface. No ice lenses were found during the 2007 – 2008 underground exploration program and none are expected in 2011 -2013 when the underground program will extend the decline to 400 m below surface so as to sample the deeper ore. There is no natural ground or surface water inflow to the underground workings.

Some water is needed for dust suppression during underground drilling and mucking. Because of the permafrost environment, this is in the form of brine at a $CaCl_2$ concentration varying between 15% to 30% by weight, dependent on air temperatures. The brine is mixed in 2000 litre batches. The mixing takes place in the contractor's shop area and the complete batch is piped from the mixing plant to a sump underground. No change is expected for the 2011 – 2013 underground program.

From the underground sumps, brine is piped to the working face, where it is used for dust suppression. As brine gathers on the floor at the working face, it is pumped back to the underground sump.

A gradual loss of brine occurs in damp, broken rock removed to surface. The underground brine system is therefore recharged with fresh batches mixed on surface. The typical rate of supply of brine to the underground drills is approximately 4000 litres per day. The typical production of broken rock from underground is 200 loose cubic metres per day. The maximum amount of water contained in broken rock is therefore 20 litres per loose cubic metre, likely much less considering system loss underground. This water adheres to dust and the faces of rock fragments, the back, and the side walls underground, as well as the broken rock that comes to surface. An unknown amount of drilling water is also lost as it is converted to water vapor during drilling operations which is carried away in the mine air.

Using a conservative number of 20 litres of water per loose cubic metre and approximately 108,000 m^3 of rock brought to surface to surface in 2007 – 2008; this resulted in a maximum of 2200 m^3 of water added to the Primary Containment Area as a result of mining. For 2011 – 2013 and approximately 235,000 m^3 of rock brought to surface; this results in a maximum of 4,700 m^3 of water added to the primary containment due to mining over 2 years. Even so, this estimated quantity is likely too high due to the surface loss due to sublimation and evaporation. The total natural runoff combined with that coming from underground would not exceed the holding capacity of the primary containment.

In the early stages of the decline advance in 2007, a sump for surface water was constructed at the base of the portal. As the underground workings were extended, two new sumps were built deeper underground, one sump for each branch of the ramp. The original sump just inside the portal is used to intercept surface runoff so that it does not enter the underground workings. The intercepted surface run-off water is pumped from the sump back to the surface sump adjacent to the portal ramp.

11.0 Local Water Quality

Local surface water quality monitoring was initiated in 1994 by Dillon Consulting followed by WMC International Ltd in 1996. Between 1997 and 2000, water sampling was conducted by RL & L under contract to WMC International Ltd. The KIA has collected water samples since 2004 and Comaplex initiated its water sampling program in 2007.

Rock, ore and till data collected by AEM and others close to the ore bodies show arsenic being naturally elevated in these samples. Because of exploration and the earlier 2007 – 2008 underground program, some 2009 water samples collected close to the area of development show concentrations of ammonia, nitrate and arsenic above the Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life, particularly within the primary containment area. On a less frequent basis, a few local samples occasionally had concentrations of copper, nickel, and iron over the Guidelines.

All analytical results for all 2009 samples were below the Metal Mining Effluent Regulations limits and can be found in Appendix B.

Water samples will continue to be collected within and downstream of the primary containment area to document the fate of trace metals and nutrients. The sampling locations are shown on figure 1 while table 5 below presents the water quality data for arsenic, an element of concern, from all studies and for all years within the watershed having the ore piles and waste rock pads. The data for 2008 and 2009 is for samples collected after the pads were built; the earlier data, before their construction.[3]

The collection of samples after building of the waste pads was timed to correspond with spring runoff and monthly thereafter until freeze-up. These samples are analyzed for physical parameters, major ions, nutrients and trace metals with a monthly report being sent to NWB and KIA. The NWB places the monthly reports on their ftp site.

Table 5. Water Quality Data for Arsenic from the Primary Containment Area to downstream Lakes and Streams (mg/L)[1]

Date	Primary Containment Area (P1)	Lake A54 (Peanut Lake)	Lake A38	Lake A8 (Pump Lake & MEL-2)	Stream A8-7	Lake A6[2]
August 1994				0.001		0.001
1996 (no date)		0.004	0.005	0.003		0.003
1996 (no date)				0.004		
April 1997				0.002		
June 1997					0.001	
July 1997				0.002		0.002
April 1998				0.002		0.005
June 1998					0.002	
July 1998				0.002	0.002	0.001
July 1999						0.004
July 2000						0.003
July 2004						0.001
September 2004						0.002
July 2005						0.003
September 2005						0.002
July 2006						0.001
September 2006						0.002
July 2007			0.004	0.002	0.002	
October 2007		0.003				
May 2008	0.004	0.002				
June 2008	0.012	0.003	0.003	0.001	0.001	
July 08		0.001		0.002	0.003	
August 2008	0.029	0.004		0.002		
October 2008	0.004	0.003		0.002	0.002	
April 2009				0.003		0.006
June 2009		0.003	0.003	0.002	0.001	
July 2009						<0.005
August 2009	0.014	0.003	0.004	0.002		
September 2009	0.011	0.004	0.006	0.003	0.002	

[1]The CCME Freshwater aquatic life guideline for As is 0.005 mg/L. The Metal Mining Effluent Regulation for As is 0.5 mg/L. Values above the guideline are highlighted in yellow.
[2]Lake A6 is two lakes downstream of Lake A8.

[3] What is noteworthy is that the mean for As in all downstream samples before the pads were built is 0.0025 mg/L while the mean for all downstream samples after the pads were built is 0.0028 mg/L.

In Appendix B, the Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the protection of Aquatic Life and the Metal Mining Effluent Regulations are compared to the 2009 data collected by Comaplex. This data is for the local area of the underground development and where most diamond drilling has occurred. The sampling locations are shown in figure 1.

The monitoring program is continuing in 2010.

12.0 Regional Water Quality

A summary of all regional water quality from 1997 to the end of 2009 is presented in the 2009 Aquatic Synthesis Report[4] prepared by Golder Associates. The report summarizes the general water quality for streams in the area as follows:

> *Baseline water quality parameters were less than Canadian Water Quality Guidelines (CWQG) for the protection of freshwater aquatic life (Canadian Council of Ministers of the Environment [CCME] 2007) and Guidelines for Canadian Drinking Water Quality (GCDWQ; Health 2008) with the exception of some parameters (i.e., nitrite, cadmium, chromium, lead, iron, manganese, selenium, silver, and phenol).*

The general water quality of lakes is characterized as:

> *Baseline water quality parameters were less than CWQG and GCDWQ with the exception of some parameters (i.e., dissolved oxygen, pH, cyanide, arsenic, cadmium, chromium, copper, lead, iron, manganese, zinc, and phenol).*

13.0 Potential Risks, Related Mitigation Measures, and Monitoring

13.1 Human Health Risk

Notwithstanding the long standing use of the camp and operation of its domestic water systems, vigilance is required for ensuring clean water for domestic use. Water for potable use is first passed through a charcoal filter followed by treatment using an ultraviolet disinfection system.

Monitoring

- Ongoing water quality monitoring will include sample collection at the Mel 1 and Mel 2 locations. A complete suite of analyses as shown in table 6 are carried out at both stations. Mel 2 is also identified as Lake A8 and is downstream of the primary containment area.
- When drilling on ice and passing through the water column, water samples are collected before and after drilling. The samples are analyzed for physical parameters and trace metals as set out in clause J6 of water license 2BB-MEL0914.

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[4] The Aquatic Synthesis Report has been posted on the NWB ftp site.

- Gray water and related issues will be monitored with samples collected at the Mel 3, Mel 3a, Mel 4 and/or Mel 7 sites. What commonly occurs in mid-summer is that the flow through the sump and wetlands moves underground and is not evidenced on the surface. As a result, samples are not collected on occasion at Mel 3 or Mel 3a.

  Parameters for which the samples are tested include: BOD_5, TSS, Oil and Grease, Feacal Coliforms and pH. These tests are required by Section J 4, Water Board License No. 2BB-MEL0914.

13.2 Leachate Risk from the Waste Rock Pads and Ore Stockpiles

The waste rock pads and ore piles can be a source for explosive residues of ammonium nitrate, and trace metals. Runoff from natural precipitation or snow melt can dissolve and/or mobilize compounds from the waste rock and ore and carry these into the containment areas. While ammonium nitrate serves as a fertilizer in the natural environment, at elevated concentrations ammonia can be toxic to aquatic organisms, in particular fish.

For the 2011 – 2013 extension of the underground exploration program, care will be taken to minimize the quantity of ammonium nitrate lost underground. The following measures will be employed:

Mitigation Measures

- Diligent use and storage of explosives underground to keep the amount of ammonium nitrate residue to a minimum.
- Keep the potential runoff from the pads to a minimum by pushing as much accumulated snow from the pads as possible before spring snow melt. The snow will be pushed downstream of the pads so as to minimize contact with the broken rock.
- Keep water use in underground mining to a minimum.

Monitoring

- Water quality in the area of the underground exploration area and water bodies downstream will continue to be monitored with samples collected at all sites indicated on figure 1. The full suite of parameters as shown in table 6 will be analyzed at all sites.

Table 6. Full Suite of Parameters for Water Quality Sampling

Physical Parameters: pH (field and laboratory), temperature (field), alkalinity, bicarbonate, carbonate, electrical conductivity, hardness, hydroxide, ion balance, oil & grease, total dissolved solids, total suspended sediments, turbidity
Nutrients: NH_4, NO_3, NO_2, PO_4
Major Ions: Ca, Cl, Mg, K, Na, SO_4
Trace Metals: Al, Sb, As, Ba, Be, B, Cd, Cr, Cu, Fe, Pb, Li, Mn, Hg, Mo, Ni, Se, Ag, Sr, Sn, Ti, U, V, Zn

13.3 Waste and Ore Storage Risk

All waste rock from the Tiriganiaq area is non-acid generating. As a result, acid rock drainage is not a problem. The ore zone, however, is classified as having an uncertain ARD potential and should be treated as potentially acid generating. The ore from the 2007 – 2008 underground exploration program is presently stored on a waste rock pad and any leachate from the ore passes over or through the pad, thereby providing a measure of safety before reaching receiving waters.

For the extension of the underground program in 2011 – 2013, the pads will be extended with the ore once again placed on waste rock pads.

Mitigation Measures

- Placement of the ore on the waste rock storage pad will allow ample exposure of all runoff to the buffering capacity of the waste rock pad as shown in figure 3. A minimum border of 5 metres will be maintained all around the stored ore piles to ensure no runoff occurs from the ore piles directly to the toe of the pad. This border will also allow space for equipment to work on the waste pads around the edges of the ore piles, if required.

Monitoring

- Water quality in the primary containment area next to the waste rock pads and ore storage is monitored monthly with samples collected at the exit near the culvert in the road.

13.4 Till Storage Risk

There are two areas where the till is stored adjacent to east and west of the portal as shown on figure 3. The till contains mostly local rock with a gradation down to silt. The till is alkaline and posing no acid drainage risk. In addition to the concern with the rock alone, there is the possibility of suspended sediments coming off the surface during a severe summer weather event and moving downstream into Lake A54.

Mitigation Measures

- The east till storage area has had a waste rock berm placed around its base to prevent any creep of the till past the present confines shown in Figure 3. No berm is presently around the west till storage location as it has not shown indications of any movement of fines to date.

Monitoring

- Visual inspection of the two till piles continues each summer for any movement or runoff with noticeable suspended solids.