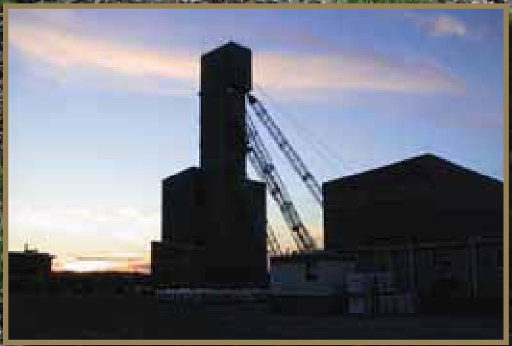
Agnico-Eagle Mines Limited

Project Description



Meliadine Gold Project

UPDATED SEPTEMBER 2011

AGNICO-EAGLE

Non-Technical Project Summary

On July 6, 2010, Agnico-Eagle Mines Limited (AEM) based in Toronto, Ontario, purchased Comaplex Minerals Corporation (Comaplex), making it a wholly owned subsidiary. At the time, Comaplex was planning to move the Meliadine Gold Project from an advanced exploration site to an operating gold mine. Exploration over the years has confirmed the potential for a gold mine.

AEM is an active mining company in the Kivalliq Region of Nunavut and, in 2010, opened the Meadowbank mine. The company has an excellent record, both as a local employer and for controlling the environmental impact of its work.

AEM proposes to build, operate and decommission an underground and open-pit gold mine near Meliadine Lake, roughly 25 kilometres north of Rankin Inlet. Currently, the life of the mine is anticipated to be about 10 years, and this may be extended as exploration is continuing. The mine will take two to three years to build before gold production can begin, and it will use proven, conventional technology. It is expected to process between 8,500 tonnes of ore per day. By Canadian standards, this constitutes a medium to large gold mine. The mine is expected to combine both open-pit and underground mining. There is excellent potential for ore extensions, leading to an extended mine life - these extensions could be located both underground at depth, and in near-surface deposits.

The total disturbed area will be approximately 1400 hectares. The mine will disrupt or destroy small areas of largely seasonal fish habitat. It will not interfere with caribou breeding grounds or most migration routes. The area in the vicinity of the site does not host any endangered plant, fish, animal or bird species. When the ore has been exhausted, the mine’s infrastructure will be dismantled and removed; pits will fill with water by natural means; underground access will be closed off; waste-rock management areas and tailings impoundment areas will be closed using approved techniques.

The mine will provide approximately 700 jobs and business opportunities for northern residents and will contribute substantially to the tax base of Nunavut. Community briefings by the site’s previous owners, as well as AEM, have been regular and frequent since 1995. The community of Rankin Inlet supports this project.

ᑕᓯᕐᕗᐊᕐᒥ ᐅᔭᕋᒃᑕᕆᐊᕐᕕᐅᓂᐊᕐᑐᖅ

ᕗᓚᐃ 6, 2010ᒥ, ᐊᒡᓂᑯ ᐃᑯ ᐅᔭᕋᒃᑕᕆᐊᑦ, ᑐᕋᑐᒥ ᐊᓐᑎᐳᕆᐅᒥ ᑎᑎᕋᕕᓕᒃ, ᓂᐅᕕᓚᐅᖅᑐᖅ ᐅᔭᕋᒃᑕᕆᐊᓂᒃ ᐊᑎᓕᒃ (ᑯᒪᐸᓚᒃ) ᐅᔭᕋᒃᑕᕆᐊᑦ, ᑕᒻᓇᓗ ᓇᒥᓂᕆᔭᐅᓕᖅᓗᓂ. ᑕᑯᐊ ᑯᓚᐸᓚᒃ ᐅᔭᕋᒃᑕᕆᐊᑦ, ᐃᓱᒪᓚᐅᖅᑐᑦ ᑕᒻᓇ ᐅᔭᕋᒃᑕᕆᐊᕐᕕᒃ ᐅᑯᐃᕐᓗᒍ ᐅᔭᕋᒃᑕᕆᐊᓕᕋᔭᖅᓗᑎᒃ ᑕᓯᕐᕗᐊᕐᒥ. ᐅᑭᐅᑦ ᐊᒥᓱᑦ ᐱᐊᓂᒃᓯᒪᓕᕐᒪᑕ, ᖃᐅᔨᒪᓕᖅᑐᑦ ᑯᓗᖅᑲᕐᒪᑦ ᐅᔭᕋᒃᑕᕆᐊᒐᐅᕗᒃᓇᕐᑐᒥᒃ.

ᐊᒡᓂᑯ ᐃᑯ ᐅᔭᕋᒃᑕᕆᐊᑦ ᑭᖑᓕᕐᒥᑦ ᐅᔭᕋᒃᑕᕆᐊᕐᕕᖅᑲᖅᑐᖅ ᐊᐳᖅᑎᓐᓇᖅᑐᒥ ᖃᒪᓂᑐᐊᑉ ᓴᓂᐊᓂ, ᑕᒻᓇᓗ 2010ᒥ ᐃᖕᒋᕋᓕᖅᓗᓂ. ᐊᒡᓂᑯ ᐃᑯ ᐱᓕᕆᑎᑦᓯᕗᕐ ᐊᒥᓱᓂᒃ ᐊᒪᓗ ᑲᒪᑦᓯᐊᕐᓗᓂ ᓄᓇᒥᒃᓗ ᑕᓯᕐᓂᒃᓗ ᐅᔭᕋᒃᑕᕆᐊᕕᕆᔭᖕᒐᑕ ᓴᓂᐊᓂ.

ᐊᒡᓂᑯ ᐃᑯ ᐅᔭᕋᒃᑕᕆᐊᑦ, ᐅᑯᐃᓯᕗᒪᕗᑦ, ᐅᔭᕋᒃᑕᕐᕕᒃᒥᒃ ᖃᖏᖅᓕᓂᐅᑉ ᓴᓂᐊᓂ ᑕᓯᕐᕗᐊᕐᒥ. ᐅᔭᕋᒃᑕᕆᐊᕐᕕᐅᓇᔭᖅᑐᖅ ᓄᓇᐅᑉ ᖃᖓᓂ ᐊᑦᓯᓕᖅᐸᓕᐊᕗᒥᒃ ᐊᒪᓗ ᓄᓇᐅᑉ ᐃᓗᐊᓄᑦ ᔭᒡᕐᓗᑎᒃ. ᑕᒻᓇ ᐅᔭᕋᒃᑕᕆᐊᕐᕕᕆᕗᒪᔭᖓᑦ 25 ᑭᓕᒥᑐᑦ ᐅᖓᓯᒃᑎᕆᕗᖅ ᑲᖏᖅᖢᓂᐅᑉ ᐊᑦᒍᐊᓂ. ᐅᔭᕋᒃᑕᕆᐊᕕᐅᓱᐊᕐᑐᖅ ᐃᖏᕋᓇᔭᖅᑐᖅ ᐅᑭᐅᓂᒃ 10ᓂᒃ. ᑭᓯᐊᓂ ᑯᓗᒥᒃ ᓇᓂᓯᑲᓂᕈᒥᒃ ᐃᖏᕋᑲᓂᕋᔭᖅᑐᖅ. ᑕᒪᑯᐊ ᐊᑐᓕᐅᓯᒪᕗᑦ ᐅᔭᕋᒃᑕᕆᐊᕐᓂᒧᑦ ᐊᑐᓕᐅᓂᐊᕐᑐᑦ, ᐊᒪᓗ 3ᓂᒃ ᐅᑭᐅᓂᒃ ᓴᓇᔭᐅᕙᓕᐊᓂᖓᓄᑦ ᓴᓇᓇᔭᖅᑐᑦ. ᐅᔭᕋᓕᕆᓕᕈᒥᒃ ᐅᕐᑯᒪᐃᑎᕆᕗᓂᒃ 6,500 ᐊᒪᓗ 15,000 ᑎᓕᓴᓴᕐᑭᐅ ᐅᐸᓗᑕᒪᑦ ᐅᔭᕋᓕᕆᑕᕋᔭᖅᑐᑦ. ᑲᓇᑕᒥ ᐅᔭᕋᒃᑕᕆᐊᕐᕕᑦ ᑕᐅᑐᒃᓗᒋᑦ, ᑕᒻᓇ ᐊᖏᓂᕐᐸᓄᑦ ᐃᓚᐅᖅᑕᐅᕗᖅ. ᖃᓄᖅ ᐅᔭᕋᓕᕆᓗᐊᕐᑎᒋᓂᐊᕐᒪᖔᑕ ᒪᓇ ᖃᐅᔨᓴᖅᑐᑦ.

ᐅᔭᕋᒃᑕᕆᐊᓕᖅᐸᑕ ᓄᓇᐅᑉ ᖃᖓᓂ ᐅᔭᕋᓕᕆᓇᔭᖅᑐᑦ, ᐊᒪᓗ ᓄᓇᐅᑉ ᐃᓗᐊᓂ. ᑕᑯᐊ ᐅᔭᕋᒃᑕᕆᐊᑦ ᖃᐅᔨᒪᕗᑦ ᐊᓯᖏᓂ ᑕᓯᕐᕗᐊᑉ ᓴᓂᐊᓂ ᑯᓗᖅᑲᑲᓂᕐᒪᑦ, ᐅᔭᕋᒃᑕᕆᐊᖅᑕᕈᓇᖅᑐᑦ ᐅᑭᐅᓄᑦ ᐊᒥᓱᓄᑦ. ᑕᒪᓇ ᐅᔭᕋᓕᕆᓂᖅ ᓄᓇᐅᑉ ᖃᖓᓂᓗ ᐊᑕᓂᓗ, ᐅᔭᕋᓕᕆᓇᔭᖅᑐᑦ.

ᐅᔭᕋᒃᑕᓕᕈᒥᒃ ᓄᓇ ᐊᓚᖑᕐᓂᖓ ᐊᖏᑎᒋᓂᐊᕐᑐᖅ 1400 ᓱᕐᑭᖅᑎᖑᑭᕐᑭᐅ. ᐅᔭᕋᒃᑕᕐᕕᒃᓗ ᐃᖅᑲᖅᑲᕐᕕᐅᕗᓂᒃ ᐊᒃᑐᐃᓗᓂ. ᑐᒃᑐᓗ ᐊᑉᕐᑯᑎᕆᔭᖕᒋᓂᒃ ᐊᒃᑐᐃᓚᖏᑐᖅ, ᓄᕐᕕᕕᖏᓂᒃᓗ. ᐅᔭᕋᒃᑕᕆᐊᕐᕕᐅᓂᐊᕐᑐᑉ ᓴᓂᐊᓂ, ᐱᕈᒃᑐᓄᑦᓗ, ᐃᖅᑲᓗᒃᓄᑦᓗ, ᑎᖕᒥᐊᖅᑐᓄᑦᓗ, ᐃᓗᐃᕗᑕᐅᓚᖏᑐᖅ. ᐅᔭᕋᒃᑕᕐᕕᒥ ᑯᓗ ᓄᖑᐸᑦ, ᐃᓗᕗᐊᓗᒃᑕᑦ, ᐱᕐᑯᑎᓗᒃᑕᑦ, ᓯᕐᑯᐸᑎᕐᓗᒋᑦ ᐊᓯᕿᒐᐅᓇᔭᖅᑐᑦ, ᓄᓇᓗ ᐃᐸᒋᒃᓴᕐᓗᒍ. ᓄᓇᒥᓗ ᐅᔭᕋᒃᑕᕆᐊᕐᕕᐅᓚᐅᖅᑐᑦ ᐃᒥᒐᐅᓗᑎᒃ ᑕᓯᕐᒥᑦ. ᓄᓇᒥᓗ ᐊᑦᓯᓗᐊᕐᑐᑦ ᐊᕐᑭᒐᐅᓗᑎᒃ. ᐅᔭᕋᐃᑦᓗ ᓯᐅᕋᒃᑕᕐᕕᑦᓗ ᒪᓂᒃᓴᒐᐅᓗᑎᒃ. ᐃᒪᕐᓗᓂᒃᓗ ᐅᔭᕋᒃᓗᓂᒃᓗ ᐃᒋᑦᓯᕕᑦ, ᐊᑐᒐᐅᓱᖅᑐᓂᒃ ᐅᔭᕋᒃᑕᕐᑯᒃᓂ ᐊᕐᑭᓱᒐᐅᓂᐊᕐᑐᑦ.

ᐅᔭᕋᒃᑕᕆᐊᓕᖅᐸᑕ ᐱᓕᕆᕗᑦ ᐊᒥᓱᓂᐊᖅᑐᑦ ᑭᓇᐅᔭᓕᐅᕐᓗᑎᒃ. ᐊᒪᓗ ᐱᓕᕆᕕᒃᓂᒃ ᓇᒥᓂᓕᑦ, ᐊᑐᒐᐅᓂᐊᕐᒥᕗᑦ. ᑲᖏᖅᖢᓂᕐᒥᐅᑦ ᐊᒥᓱᑦ ᐱᓕᕆᐊᖅᑲᕐᓗᑎᒃᓗ, ᓄᓇᐅᑉᓗ ᐊᑐᕐᓂᖓᓄᑦ ᐊᑭᓕᕈᑎᑦ ᐊᑭᓕᒐᐅᓗᑎᒃ. ᑕᒻᓇ ᓄᓇᕗᒥᐅᓄᑦ ᐃᑲᔪᕐᓂᖅᑲᕐᓂᐊᕐᑐᖅ. ᐅᑭᐅᒥᑦ 1995ᒥᑦ ᐱᒋᐊᖅᓱᒍ ᑕᒻᓇ ᐅᔭᕋᒃᑕᕆᐊᕐᕕᐅᓱᐊᖅᑐᖅ ᐅᖃᐅᓯᐅᑕᖅᑐᖅ ᑲᖏᖅᖢᓂᕐᒧᐅᓄᑦ, ᑕᒪᓇᓗ ᐅᖃᐅᓯᑕᖅᑐᐃᓇᕐᓗᓂ. ᐊᒥᓱᑦᓗ ᑲᖏᖅᖢᓂᕐᒥᐅᑦ ᐃᑲᔪᖅᑐᐃᕗᑦ ᑕᐸᓱᒥᖕ ᐅᔭᕋᒃᑕᕆᐊᕕᐅᓱᐊᕐᑐᒥᒃ..

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SECTION 1 INTRODUCTION

The information and concepts presented in this project description are based on the March 2011 Technical Report (AEM, 2011a), which highlights the potential of the Meliadine property to host an economically viable gold mine. It also includes the initial results of the feasibility study, which is still to be completed. Baseline socio-economic and environmental data collected since 1997, and public consultations conducted since 1995, were also used in preparing this project description.

Following the purchase of the Meliadine Gold Project (project) in July 2010, Agnico-Eagle Mines Ltd. (AEM) initiated a preliminary feasibility study for the base case of a 3,000-tonne-per-day (tpd) gold mine. This allowed AEM to develop an understanding of the property, the mineralogy of the deposit, possible mining methods and other aspects of the project. The feasibility study was completed in March 2011. Based on its conclusions, AEM has initiated another feasibility study, which will include an evaluation of the site's optimal production rate. A production rate of 8,500 tpd was selected based on current known mineral resources. The production rate could be re-evaluated and potentially increased if additional mineral resources are confirmed. While the feasibility study is not expected to substantially change the design and operation of the project described here, refinements are anticipated as AEM completes additional work and advances its knowledge of the property.

1.1 Project Location and Ownership

The Meliadine Gold Project is located approximately 25 kilometres north of the hamlet of Rankin Inlet on the west coast of Hudson Bay, Nunavut. The main gold deposits of the Meliadine project are situated on Inuit Owned Land that is administered by Nunavut Tunngavik Inc. (NTI; subsurface and mineral rights) and the Kivalliq Inuit Association (KIA; surface rights) on behalf of the Inuit beneficiaries as designated under the Nunavut Land Claims Agreement. The Meliadine gold property is a group of mineral leases, claims, and concessions—held solely by AEM—that were staked and grandfathered under the Canadian Mining Regulations before the Nunavut agreement.

AEM's proposed mining project comprise mineral deposits at six separate locations on the property: the Tiriganiaq, F Zone, Wolf, Pump, Wesmeg and Discovery deposits.The project's co-ordinates are centred on the underground portal at 63°01'30"N, 92°10'20"W (UTM 6988500N, 540250E; NAD 83, zone 15; National Topographic Survey sheets 55/J, N, and O). The general project location and configuration of land tenure is shown in Figure 1-1.

Proponent Information

The Meliadine Gold Project is being managed by Agnico-Eagle Mines Ltd., a Canadian publicly traded mining company listed on the Toronto and New York Stock Exchanges, trading symbol AEM, with head offices in Toronto, Ontario.

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AEM maintains a Project support office in Rankin Inlet. The address for this office is:

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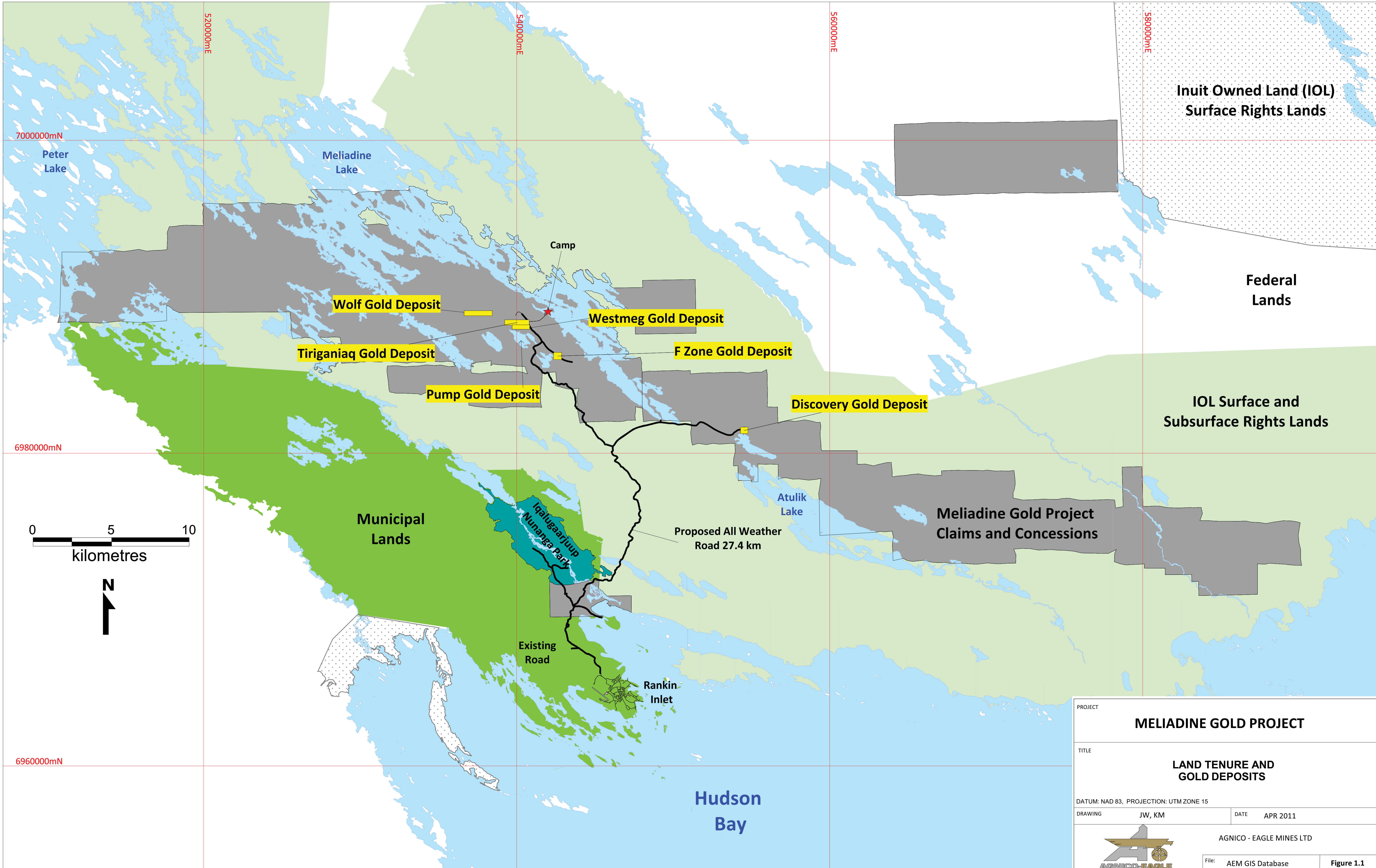


520000mE
540000mE
560000mE
580000mE
7000000mN
6980000mN
6960000mN
Inuit Owned Land (IOL)
Surface Rights Lands
Peter Lake
Meliadine Lake
Camp
Wolf Gold Deposit
Westmeg Gold Deposit
Tiriganiaq Gold Deposit
F Zone Gold Deposit
Pump Gold Deposit
Discovery Gold Deposit
Federal Lands
IOL Surface and
Subsurface Rights Lands
Atulik Lake
Meliadine Gold Project
Claims and Concessions
Proposed All Weather
Road 27.4 km
Municipal
Lands
Iqalugaarjuup
Nunanga Park
0 5 10
kilometres
N
Existing
Road
Rankin
Inlet
Hudson
Bay
PROJECT
MELIADINE GOLD PROJECT
TITLE
LAND TENURE AND
GOLD DEPOSITS
DATUM: NAD 83, PROJECTION: UTM ZONE 15
DRAWING JW, KM
DATE APR 2011
AGNICO - EAGLE MINES LTD
File: AEM GIS Database
Figure 1.1

1.2 Brief Project History

Rankin Inlet was established as a mining community in the early-to-mid-1950s with the discovery and subsequent development of a nickel mine. North Rankin Nickel Mines identified gold mineralization in the area of Meliadine Lake during an exploration program for nickel and copper in the early 1960s. The first mineral claims in the project area were staked by Comaplex and Asamera Minerals Inc. in 1987, with the Discovery deposit being found on the eastern half of the property in late 1989.

Successive exploration programs by Asamera, Rio Algom Ltd., and Comaplex from 1990 to 1994 identified gold mineralization along the 80-kilometre-long east-west-trending Pyke Fault, with the first holes drilled into the Tiriganiaq, F Zone, and Pump deposits by Comaplex in 1993 and 1994. From 1995 to 2000, substantial exploration by WMC International Ltd., through an option on the western half of the Meliadine property, significantly expanded the Tiriganiaq deposit, led to the discovery of the Wolf deposit, and expanded the F Zone and Pump deposits. Work by Comaplex in 1996 and 1997 concentrated on the Discovery deposit on the eastern half of the property, known as Meliadine East.

In the ensuing years, and until late 2003, Comaplex and its partners continued exploration on Meliadine East, while little field work was completed by WMC on Meliadine West. In late 2003, Comaplex acquired WMC International's interest in the Meliadine West property. From 2004 onward, Comaplex devoted the majority of its efforts to outlining new, higher-grade gold resources in the deeper parts of the Tiriganiaq deposit, and to reconnaissance work on outlying targets. Sporadic exploration was conducted on Meliadine East.

In 2007 and 2008, Comaplex conducted an underground exploration and bulk sample program on the Tiriganiaq deposit. In early 2009, Comaplex completed a preliminary assessment for the Meliadine property, using independent mining consultant Micon International Ltd. This assessment indicated that the property had the potential to support a mining operation. On the basis of this information, Comaplex elected to advance the project to the feasibility level, and initiated the regulatory process to permit a mining operation on the property.

On July 6, 2010, AEM completed its purchase of Comaplex, making it a wholly owned subsidiary. The first drilling was done on the property's Wesmeg deposit. AEM is continuing with Comaplex's earlier decision to pursue the development of a gold mine.

A complete year-by-year synopsis of exploration activity and results for both the eastern and western halves of the Meliadine Gold Project is presented in Appendix A.

1.3 The Proposed Project

The proposed project would be a gold-only operation, with gold mined, milled, and poured on site. Preproduction surface and underground construction is expected to require about two to three years to complete. The mine's production rate will be 8,500 tpd. The continued success of exploration programs could lead to a re-evaluation of the optimal production rate. The project proposes to combine open-pit and underground mining. Based on current known resources, these methods will result in an estimated operating life of about 10 years for the mine. Mining is proposed on six gold deposits on the property at this time: Tiriganiaq as the main deposit, and the F Zone, Wesmeg, Pump, Wolf and Discovery deposits as satellite operations. Gold mineralization extends to the bedrock surface in all six deposits, but is generally covered by glacial deposits of varying thicknesses. Permafrost is present from the surface to a vertical depth of between 350 and 450 metres.

Gold mineralization in these six deposits is mostly mesothermal quartz-vein-dominated gold systems in strongly sheared and complexly folded host rocks or Archean turbidites, iron formation and volcanic rocks. Within each deposit are many gold-bearing lodes of quartz-vein stockwork, laminated veins and sulphidized iron formation with strike lengths of up to three kilometres. The stratigraphic units generally strike northwest-southeast, dip steeply to the north and are overturned, with the oldest units to the north. All six deposits remain open at depth, providing excellent potential for the discovery of additional gold resources and extension of the proposed mine's life. There is also the potential that other mineable gold deposits will be found in the surrounding area.

Open-pit mining is proposed for the Tiriganiaq, F Zone, Pump, Wolf, Wesmeg and Discovery deposits using conventional surface-mining methods. At present, underground mining is also proposed for the Tiriganiaq deposit, and a combination open-pit and underground scenario is envisioned for the Wesmeg and F Zone deposits. The draft Environmental Impact Statement (EIS) and further exploration results will provide greater detail about which deposits could host underground mining; this cannot be discounted at any of the deposits.

A mill will be built on the site. It will treat the mineralized material by crushing and grinding the rock, followed by gravity separation, intensive cyanidation of the gravity concentrate, cyanidation of the gravity tailings, and carbon adsorption. These processes will be followed by elution, electrowinning and refining. The final step is the smelting of gold bars on-site. Before the tailings are discharged to the tailings impoundment area, they will be treated with a cyanide destruction step. Water and reagents used in these processes will be recycled to the greatest extent practicable. The waste-rock, overburden and tailings impoundment areas will be designed to minimize the size of the project footprint, and environmental impacts, as much as possible.

A fully catered permanent camp will be built on the site to accommodate employees, along with other infrastructure appropriate to a remote mine site. Power for the site[1] would be diesel-generated with the

[1] The alternative of locating the power plant in Rankin Inlet is being investigated as part of the feasibility

fullest possible use of waste heat. A 23.8-kilometre-long all-weather road is currently undergoing environmental screening. The road is needed to service an approved underground exploration and bulk-sampling program. It will connect the mine site with Rankin Inlet. Supplies would arrive in Rankin Inlet by ship, barge and air, and moved to the site by road as required. Proposed upgrades to the infrastructure in Rankin Inlet would include a laydown area and a tank farm with a capacity of approximately 80 million litres. These facilities could continue to benefit the community after the mine is closed.

The construction phase of the project will see the greatest number of workers at the site; between 700 and 800 people could be present at a time. During the operations phase, the total payroll of the proposed mine is estimated at 700 to 800, with a total workforce of about 500 on site at any one time. The recruitment of employees will maximize opportunities for inhabitants of Rankin Inlet and nearby Kivalliq communities. The balance of the workforce will be flown in and out from other parts of Canada. The mine would operate 24 hours a day, 365 days a year. As with Meadowbank, workers will be on a two-week rotation—two weeks at work, two weeks off.

AEM intends to develop the Meliadine Gold Project in an environmentally and socially responsible manner, ensuring the highest level of environmental care in conserving the natural environment, while at the same time enhancing the well-being of the Inuit, particularly those living in or near Rankin Inlet and neighbouring communities. For the life of the mine, sustained benefits will flow to the owners of the company, its employees, the Inuit, and the federal and Nunavut governments.

1.4 Project Schedule

As with many industrial activities in the North, schedules for projects such as that proposed at the Meliadine property reflect a balance of logistical and technical considerations as well as the timing of regulatory approvals. The feasibility study will take full account of environmental and community concerns and regulatory requirements. Its findings will contribute to both the draft and final Environmental Impact statements. At the same time, the efficient execution of the project and its delivery of benefits to the Government of Nunavut and local communities will depend on the timely issuing of permits. Instances have occurred in the past in which a small delay in issuing a permit has delayed a project by a year because of missed shipping seasons (e.g. open-water periods in summer or ice roads in winter). A detailed, realistic schedule of construction and preproduction activities, combined with expected and timely regulatory approvals, are essential if the project is to move forward.

At this level of study, important milestones and a schedule for the Meliadine project are estimated in Table 1.1. These major schedule components will be refined as required.

study. If this should be the case, a power line would supply power to the mine.

Table 1-1 Important Milestones and Project Schedule

Activity	Date
Revised Project description filed	September 2011
Feasibility and optimization study	April 2011 - 2013
Project infrastructure's detailed engineering	September 2012 - 2014
Continuing mineral exploration on site and on adjacent mineral claims	2011 – 2026
Environmental assessment/regulatory review	September 2011 - June 2013
Permits / authorizations / and other agreements	September 2011 - May 2015
Inuit Impact Benefit Agreement	January 2011 - 2013
Underground Exploration & Bulk Sampling Program	2011 - 2013
Underground development & mining	2012 - 2026
Construction of all-weather road (under separate review)	March 2012- August 2012
Predevelopment of infrastructure in Rankin Inlet and on site	March 2012 - November 2015
Prestripping of Tiriganiaq pit and building of tailings impoundment area	July 2014 - September 2015
Open-pit mining of Tiriganiaq, F Zone, Discovery, Wesmeg, Pump & Wolf	October 2015 - 2025
Operation of the mill complex	2016 - 2026
Reclamation and closure	2026 - 2029

Exploration will continue during the environmental assessment and regulatory processes, as well as throughout the life of the mine. Diamond-drilling is required in order to better define existing mineral resources and also to find new resources on the minerals claims. Underground exploration using the existing portal is proceeding, and the decline is being extended to a depth of 400 metres to facilitate underground drilling and bulk sampling. This work has been approved by the Nunavut Water Board under Water Licence 2BB-MEL0914. As in previous years, geotechnical drilling to shallow depths is likely on the mineral claims. Condemnation drilling will be carried out in 2011 to allow sites to be selected for mine infrastructure.

1.5 Project Fact Sheet

Ownership: AEM is the sole owner of the Meliadine Gold Project.

Location: The site is located south of Meliadine Lake, 25 kilometres north of Rankin Inlet.

Access: Current winter-road access from Rankin Inlet and by helicopter from Rankin Inlet airport. Ultimately, access during underground exploration, construction and production will be by a ~~27.4~~23.9-kilometre all-weather road connecting the mine site to Rankin Inlet.

Mineral Claims: The main gold deposits are situated on leased claims under the Canada Mining Regulations that were staked prior to the Nunavut Land Claims Agreement.

Mining Method: The plan for the mine is to combine both open-pit and underground exploitation. The mine's production rate is expected to be between 6,500 and 15,000 tonne-per-day, pending results of the continuing feasibility study. Over the life of the project, the deposits are expected to be mined in sequence, with some overlap possible. The project's total area of disturbance will cover an estimated 1400 hectares.

Mining Areas: Open-pit and/or underground mining is planned at six deposits:

- **Tiriganiaq** – mill site is expected to be located immediately east of the Tiriganiaq deposit.
- **F Zone** –located approximately three kilometres south of the proposed mill site.
- **Discovery** –located approximately 21 kilometres southeast of the proposed mill site.
- **Wesmeg** – located approximately 300 metres south of the Tiriganiaq pit.
- **Wolf** – located approximately five kilometres west of the proposed mill site.
- **Pump** – located approximately three kilometres southwest of the proposed mill site.

Life of Mine: Current estimates support a 10-year mine life based on estimated mineral resources as of Dec. 31, 2010. The property has excellent exploration potential and an extension of this estimate is possible with further work.

Gold Resource: Based on estimated mineral resources as of Dec. 31, 2010, the probable reserves were 2.6 million ounces of gold; indicated resources were 1.5 million ounces and inferred resources were 2.6 million ounces.

Mill Process: The ore will be processed using a conventional gold-milling circuit. The ore size will be reduced to the consistency of fine sand using a sequence of crushing and grinding circuits. A portion of the gold will be recovered in a gravity circuit. The remaining gold will be recovered using intensive cyanidation and carbon adsorption, followed by elution, electrowinning and refining. Residual cyanide will be recovered and/or destroyed prior to the deposition of tailings in the management area. The final step will be the smelting of gold bars on-site. Gold will be transported off-site via air to the Royal Canadian Mint.

Personnel: A project workforce of approximately 700-800 personnel is required for operations, with around 500 on-site at any one time.

1.6 Mineral Claims and the Nunavut Land Claims Agreement

The main gold deposits of the Meliadine project are situated on Inuit Owned Land that is administered by Nunavut Tunngavik Inc. (NTI; subsurface and mineral rights) and the Kivalliq Inuit Association (KIA; surface rights) on behalf of the Inuit beneficiaries as designated under the Nunavut Land Claims Agreement.

The mineral claims underlying the main deposits at the Meliadine project were staked with the Government of Canada prior to the signing of the Nunavut Land Claims Agreement in 1999, and have been held continuously by the holder of the mining rights (formerly Comaplex and now AEM). Consequently, they are considered to be grandfathered under the Nunavut agreement; this means the payment of mineral-production royalties to the owner of the land and mineral rights is administered by the Government of Canada under the Canada Mining Regulations, unless otherwise mutually agreed to by the mineral claim-holder and the mineral rights-owner. The royalties collected are transferred to Nunavut Tunngavik Inc. as the new owner of the subsurface mineral rights.

The Meliadine Gold Project consists of 52,173 hectares--887 hectares as claims and 51,286 hectares as leases. Those 51,286 hectares of leases are held under the above-mentioned mining regulations, administered by Indian and Northern Affairs Canada (INAC), and referred to as Crown Land. As well, AEM has 3,430 hectares of subsurface concessions from NTI, in which the subsurface mineral rights are administered directly by NTI.

1.7 Applicable Acts, Regulations and Guidelines

Appendix B lists the federal and territorial government acts, regulations and guidelines that apply to the Meliadine project.

1.8 Current Licences, Permits, Agreements and Approvals

Land management and environmental management in the region of the project are generally governed by the provisions of the Nunavut Land Claims Agreement. Table 1-2 lists the current licences, authorizations and permits held by the Meliadine project.

Table 1-2 Current Licences and Permits – Meliadine Gold Project

Type	Permit Number	Issuing Agency	Expiry date
Type B Water Licence	2BB-MEL0914	Nunavut Water Board	31 Jul 2014
Exploration Land-Use Licence	KVL100B195	Kivalliq Inuit Association	31 Oct 2012
Drilling Land Use Licence	KVL302C268	Kivalliq Inuit Association	1 Jul 2012
Overland Right-of-Way	KVRW07F02	Kivalliq Inuit Association	26 Oct 2012
Meliadine Lake Right-of-Way	KVRW98F149	Kivalliq Inuit Association	30 Apr 2012
Commercial Lease	KVCL102J168	Kivalliq Inuit Association	30 Jun 2012
Mainland Esker Quarry Permit	KVCA07Q08	Kivalliq Inuit Association	15 Sep 2012
WSCC Program Authorization		Workers' Safety & Compensation Commission	31 Dec 2011
CWM Claims Drilling Permit	N2007C0041	Indian and Northern Affairs	13 Apr 2012
Hamlet Disposal Authorization	Letter of approval	Hamlet of Rankin Inlet	[1]
Scientific Research Licence	0301 309N-M	Nunavut Research Institute	31 Dec 2011
Exploration Land-Use Licence	KVL308C07	Kivalliq Inuit Association	13 Jun 2012
Type B Water Licence	2BE-MEP0813	Nunavut Water Board	31 Oct 2013

[1] Terminated as a landfill will be built on site.

1.9 Required Licenses, Permits, Agreements and Approvals

The first approval required by the Meliadine Gold Project is a determination by the Nunavut Planning Commission that the project conforms to the Keewatin Regional Land Use Plan. Once this determination is obtained, the Nunavut Impact Review Board (NIRB) can initiate the environmental-assessment process. The NIRB can then grant or deny the second approval, a Project Certificate. Further licences and operating permits can be issued only after the Project Certificate has been obtained. Upon receiving a Project Certificate, the Meliadine project will proceed to obtain a Class A Water Licence from the Nunavut Water Board (NWB). The water licence will allow for the use of fresh water and the deposit of wastes to receiving water.

Authorization(s) from the Department of Fisheries and Oceans (DFO) will be needed, because fish habitat is likely to be altered, disrupted and/or destroyed by the development of the mine. The Meliadine project will also require a Schedule 2 listing under federal Metal Mining Effluent Regulations (MMER), because Lake B7 and associated small ponds are expected to be used as tailings impoundment areas, resulting in the permanent loss of these water bodies. An alternatives assessment is currently underway to assist in selecting the most appropriate option for mine waste disposal from environmental, technical and socio-economic perspectives. As the Meliadine Gold Project is on Inuit land, a number of permits will be required to carry out commercial production and continue exploration drilling.

A list of anticipated permits, licences, agreements, authorizations and approvals for the project is presented in Table 1-3.

Table 1-3 Pending Permits, Licences, Agreements and other Authorizations

Authorization	Authority	Basis
Conformity determination with Keewatin Regional Land Use Plan	Nunavut Planning Commission	Allows project to proceed to environmental-impact review
Project Certificate	Nunavut Impact Review Board	Allows project to proceed to authorizations to operate
Type A Water Licence	Nunavut Water Board	Allows use and disposal of water and waste
Inuit Impact Benefit Agreement	Kivalliq Inuit Association	Ensures compensation for negative impacts; ensures benefits flow to the Inuit
Water Compensation Agreement	Kivalliq Inuit Association	Ensures compensation for negative impacts on water
Development Partnership Agreement	Economic Development & Transportation - NU	Ensures socio-economic benefits flow to local communities
Production Lease	Kivalliq Inuit Association	Allows production on Inuit land
Certificate of Exemption	Kivalliq Inuit Association	Non-commercial activity such as environmental monitoring will continue into operations
Quarry Approval	Hamlet of Rankin Inlet	Aggregates and rock for construction of laydown area and tank farm
Approval to Construct	Hamlet of Rankin Inlet	Construction of fuel tank-farm, laydown area, and secure storage area in the industrial area
Schedule 2 Amendment to Metal Mining Effluent Regulations	Environment Canada / Department of Fisheries and Oceans / Transport Canada	Use of fish-bearing water bodies/navigable waters for a Tailings Impoundment Area (TIA)
Fisheries Authorizations	Department of Fisheries and Oceans	No-net-loss: to replace fish habitat lost due to the alteration, disruption and/or destruction of habitat
Navigable Waters Permits	Transport Canada	The possible building of a jetty in Meliadine Lake and, if Lake B7 is a navigable water, a submission to Privy Council with Env. Canada
Explosive Manufacturing Licence (renewal by contractor)	Natural Resources Canada	Storage, manufacture and use of explosives at the mine site
Explosive Magazine Permit renewal	Workers' Safety & Compensation Commission	Permits the placement of an explosive magazine on site and temporary magazine outside Rankin Inlet
Nuclear Substances & Radiation Devices Licence	Canadian Nuclear Safety Commission	Gauges for use in the mill
Mineral Lease	Indian and Northern Affairs Canada	Maintain surface and subsurface rights around mineral lease
Class 2 Permit for Heritage Sites obtained by qualified, professional archaeologist	Department of Culture, Language, Elders, & Youth	Two heritage sites within the boundaries of the Tiriganiaq pit & several where mine site infrastructure could be located
Socio-economic & Traditional Knowledge Research Licence obtained by qualified contractor(s)	Nunavut Research Institute	Continuing further Inuit Qaujimajatuqangit and socio-economic studies

SECTION 2 PROJECT DESCRIPTION

The Meliadine project involves building, operating, decommissioning and rehabilitating a conventional gold mine. Some facilities development will take place at Rankin Inlet, where materials will be received by air and sea transport. Year-round access between Rankin Inlet and the mine site will be facilitated by an all-weather road.[2] Mine site development will include open-pit and underground mining that will provide ore to the mill. The mill; camp; powerhouse;[3] tank farm; tailings impoundment area; waste rock and overburden management areas; water supply and sewage treatment plant are integral components of this proposal. At this time, six gold deposits have been identified on the Meliadine property, of which Tiriganiaq is the most significant. The other deposits are F Zone, Discovery, Wolf, Pump and Wesmeg. Underground mining is planned for Tiriganiaq and possibly Wesmeg and F Zone. Underground mining at the other three deposits cannot be discounted, and will be subject to more exploration drilling and the completion of the feasibility study.

2.1 Mineral Resources

Estimates of the mineral resources at the Meliadine gold deposits are updated annually, thereby allowing for each season's drilling results to be incorporated. In February 2011, AEM released its Dec. 31, 2010 mineral resource estimates in a NI 43-101 compliant Technical Report (AEM, 2011a). This report and the supporting feasibility study (AEM, 2011b) assessed the potential of the Tiriganiaq, F Zone, Wesmeg, Discovery, Wolf, and Pump deposits to support a gold-mining operation based on a resource of 6.7 million ounces of gold, as outlined in Table 2-1.

Table 2-1 Mineral Resource Estimates as of 31 December 2010 (oz. gold)

	Probable Reserves	Indicated Resources	Inferred Resources
Tiriganiaq Deposit	2,600,000	810,000	1,913,000
F-Zone Deposit		329,000	183,000
Discovery Deposit		315,000	143,000
Wolf Deposit		22,000	160,000
Pump Deposit			100,000
Wesmeg Deposit			143,000
Total	**2,600,000**	**1,476,000**	**2,642,000**

[2] The Phase 1 all-weather access road is a separate predevelopment application and is solely for the purpose of resupplying the Meliadine ongoing exploration and bulk sampling programs with fuel and materials. The Phase 2 road will be assessed as part of the draft EIS. ~~is part of a separate application as it is required to service the approved underground exploration and bulk-sampling program.~~

[3] The alternative of locating the power plant in Rankin Inlet was found to be infeasible, and all power generation will occur at the mine site. ~~is being investigated as part of the feasibility study. If this should be the case, a power line would supply power to the mine.~~

Exploration work in 2010 resulted in a first-time estimate of reserves and a change in the estimated resources for the Meliadine project. As of Dec. 31, 2010, the project had probable gold reserves of 9.5 million tonnes grading 8.5 g/t gold (for 2.6 million ounces of gold); indicated resources of 8.8 million tonnes grading 5.2 g/t gold (for 1.5 million ounces of gold); and inferred resources of 11.8 million tonnes grading 6.9 g/t gold (for 2.6 million ounces of gold).

From 2011 onward, the drilling program will continue to convert "inferred" resources to "indicated" resources, and will improve the confidence in, and quality of, the estimates for the Wesmeg, F Zone, Pump, Wolf and Discovery deposits. The resource estimates will be adjusted accordingly in the Environmental Impact Statement.

2.2 Project Construction

The development of the Meliadine project will require land near Rankin Inlet, mainly for storage, as well as at the mine site for infrastructure, open pits, waste rock/overburden and tailings impoundment areas. The anticipated land requirements are tabulated in Table 2-2. AEM is dedicated to minimizing as much as possible the footprint of its operations. These numbers are subject to the completion of the feasibility study, and may change slightly. The results of the study will be presented in the Environmental Impact Statement.

Table 2-2 Approximate Land Requirements for Mine Components (hectares)

Project Component	Area
Off-site developments in Rankin Inlet	14
On-site mine infrastructure	65
Open Pits	313
Waste rock/overburden management areas	628
Ore stockpile	48
Mine-site roads (around 30 km)	82
Tailings impoundment area	240
Total	**1391**

2.3 Project Infrastructure Located in Rankin Inlet

2.3.1 Dockside Laydown Area – Rankin Inlet

During the construction and operation of the proposed mine, the majority of the materials and supplies will be transported to Rankin Inlet by seasonal sealift. For the first three years, construction materials will be off-loaded; this will be followed in later years by mine supplies. Upon arrival, materials and supplies will be unloaded and moved directly to the site.

The established harbour at Itivia will be used to receive loaded barges from Becancour, Quebec or other Canadian eastern ports during the open-water season. The procedures for off-loading equipment in the Itivia harbour will largely be similar to those for the Meadowbank gold mine at Baker Lake. The ship(s) will be located offshore in deep water where it/they will be offloaded onto barges for the transport of materials to the Itivia harbour. A spud barge will be located at the off-loading ramp. One end of the barge will be connected to the shore while the other end, having a crane, will lift sea-cans and other containers and equipment directly off the delivery barges, and place them onto trucks. A level, drained area of approximately 14 hectares will be established on land leased from Nunavut airports. The laydown area and the location of the spud barge are shown in Figure 2-1.

Incoming air freight will be moved directly from the airport to the mine site. Expediting services are currently provided by a local contractor. The implementation of the project will greatly increase the scope of this work, resulting in greater local employment opportunities.

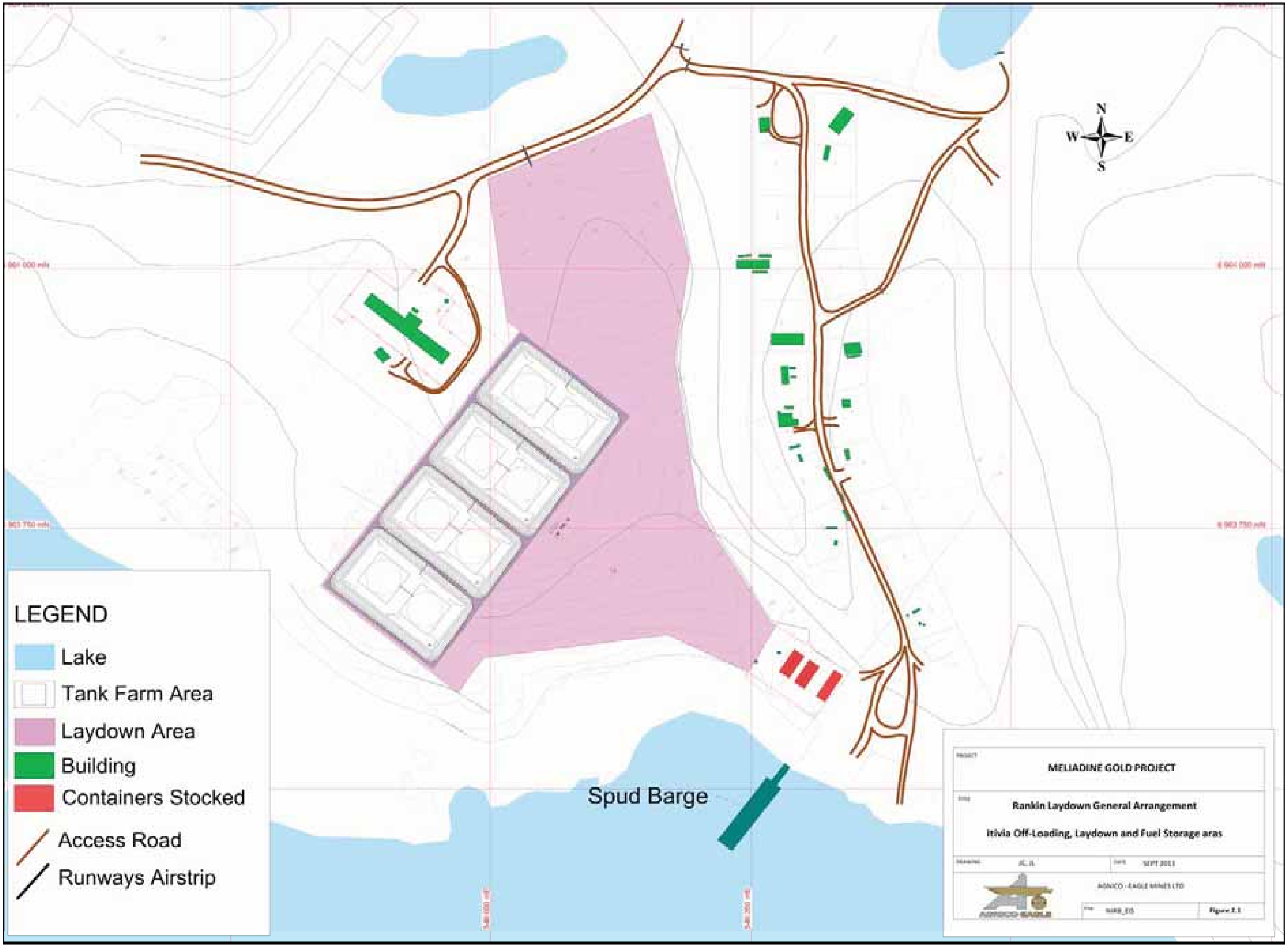
2.3.2 Fuel Storage Area – Rankin Inlet

The fuel storage tanks will have the capacity to store nine or 10 months' worth of fuel. In total, the Rankin Inlet tank farm would need a storage capacity of as much as 80 million litres[4]. The tanks would be field-erected steel tanks built to API-650 standards. They will be situated in a lined and bermed containment area capable of containing 110 per cent of the contents of the largest tank. The storage tanks and fuel-dispensing systems will be constructed in accordance with current regulatory requirements and fire regulations.

Annual fuel shipments to Rankin Inlet will come via deep-sea vessels from eastern ports during the open-water season—late July to early September. Fuel will be pumped from the vessels to the tank farm using a floating pipeline. This is the same procedure common to Nunavut communities. From Rankin Inlet, fuel will be transported year-round by double-walled tanker trucks to the Meliadine tank farm. An outline of the Rankin Inlet tank farm is shown in Figure 2-1.

Discussions are well under way between AEM and Nunavut airports for AEM to lease approximately 14 hectares of airport land for the proposed tank farm and laydown area near the Itivia harbour.

4 The tank farm will have eight 10-million-litre steel tanks within a bermed area.



N
W
E
S
LEGEND
Lake
Tank Farm Area
Laydown Area
Building
Containers Stocked
Access Road
Runways Airstrip
Spud Barge
MELIADINE GOLD PROJECT
Rankin Laydown General Arrangement
Itivia Off-Loading, Laydown and Fuel Storage aras
SEPT 2011
AGNICO - EAGLE MINES LTD
Figure 2.1

2.4 Road Access and Routes

2.4.1 Phase 1 All-Weather Access Road from Rankin Inlet to Meladine Site

The Phase 1 AWAR will involve the construction of a 23.8-kilometre-long road between the Char River bridge turnoff and the Meliadine West Exploration Site, with access controlled by a manned gate located just after the Char River bridge turnoff. It will solely facilitate the timely transport of fuel and materials for the purposes of resupplying the ongoing advanced exploration program, obtaining year-round services from businesses in Rankin Inlet, and transporting workers between Rankin Inlet and the site. The Phase 1 road is shown in Figure 2-2 along with the quarries to be used.

The road follows a network of well established trails that have traditionally been used to reach the Meliadine area. Access today is not along a single trail used by everyone, but on a network of trails developed over the years by different users, each using the trail best suited for the conditions at the time. Snowmobiles and all-terrain vehicles have developed these trails over the years.

The proposed road construction schedule is illustrated in Figure 2-3. AEM is preparing an application to seek authorization to construct the Phase 1 AWAR as a predevelopment activity, as provided for under Sections 12.10.2 and 13.5.5 of the Nunavut Land Claims Agreement, under the Part 5 review of the full Meliadine Gold Project development.

The Phase 1 AWAR will be a nominal single-lane road with a running surface 6.5 metres in width. There will be passing turnouts 30 metres in length, set at intervals of approximately 350 metres. The nominal running surface at each passing turnout will be 9.5 metres in width. The minimum road depth will be 1.0 metres for areas over non-thaw-susceptible soil (well-drained soil over bedrock) and 1.3 metres for areas over thaw-susceptible soil (poorly drained, ice-rich, organic or bog over bedrock). In both cases, the side slope of the road would be 2.5H:1V. Thus the maximum nominal base width of the road will be 13.0 metres, increasing to 16.0 metres at each passing turnout, for a road thickness of 1.3 metres.

There will be a total of 10 water crossings along the road route. Two of these crossings will be achieved using clear-span bridges, at the Meliadine River and an unnamed stream at kilometre 5.0. The other stream crossings will be achieved using culverts. AEM will install a new clear-span bridge immediately adjacent to the existing Char River Bridge that is located on the existing municipal-owned and -operated road to the Iqaluqaarjuup Nunanga Territorial Park. The installation of the new clear-span bridge will be on municipal land, and will proceed upon hamlet approval and only after all approvals are received for the AWAR. This bridge will be installed by AEM, at AEM's expense, to accommodate the heavier and wider loads that will be transported to the Meliadine Exploration Site. The new Char River Bridge is required because the existing bridge is too narrow, its maximum load is only 50 tonnes, and its abutments are at risk of being undermined by the river at certain times of the year, most notably during the spring freshet. The new Char River Bridge will be a 29.5-metre single-span steel bridge. The new bridge will be located immediately west of the current bridge, but its abutments will be set back farther from the river and have substantially more armouring to protect them.

A new 66.3-metre single-span steel bridge will be built across the Meliadine River. It will be approximately three metres above the water, which meets the requirements for navigable waters. For stream crossing M5.0, a single-span steel bridge of 23.5 metres will be built so that the natural channel of the stream remains unaffected and fish habitat is not disturbed.

The design for the three (3) bridges to be installed is based on the Canadian Highway Code, using design CSA, S6-06, CL-625. For design stress loads, two 18-metre-long vehicles of GVW (gross vehicle weight) of 62,500 kg are considered to be travelling simultaneously on a bridge. The loading is factored by a 40 per cent dynamic allowance and another 60 per cent safety factor. The ultimate capacity is around 280,000 kg.

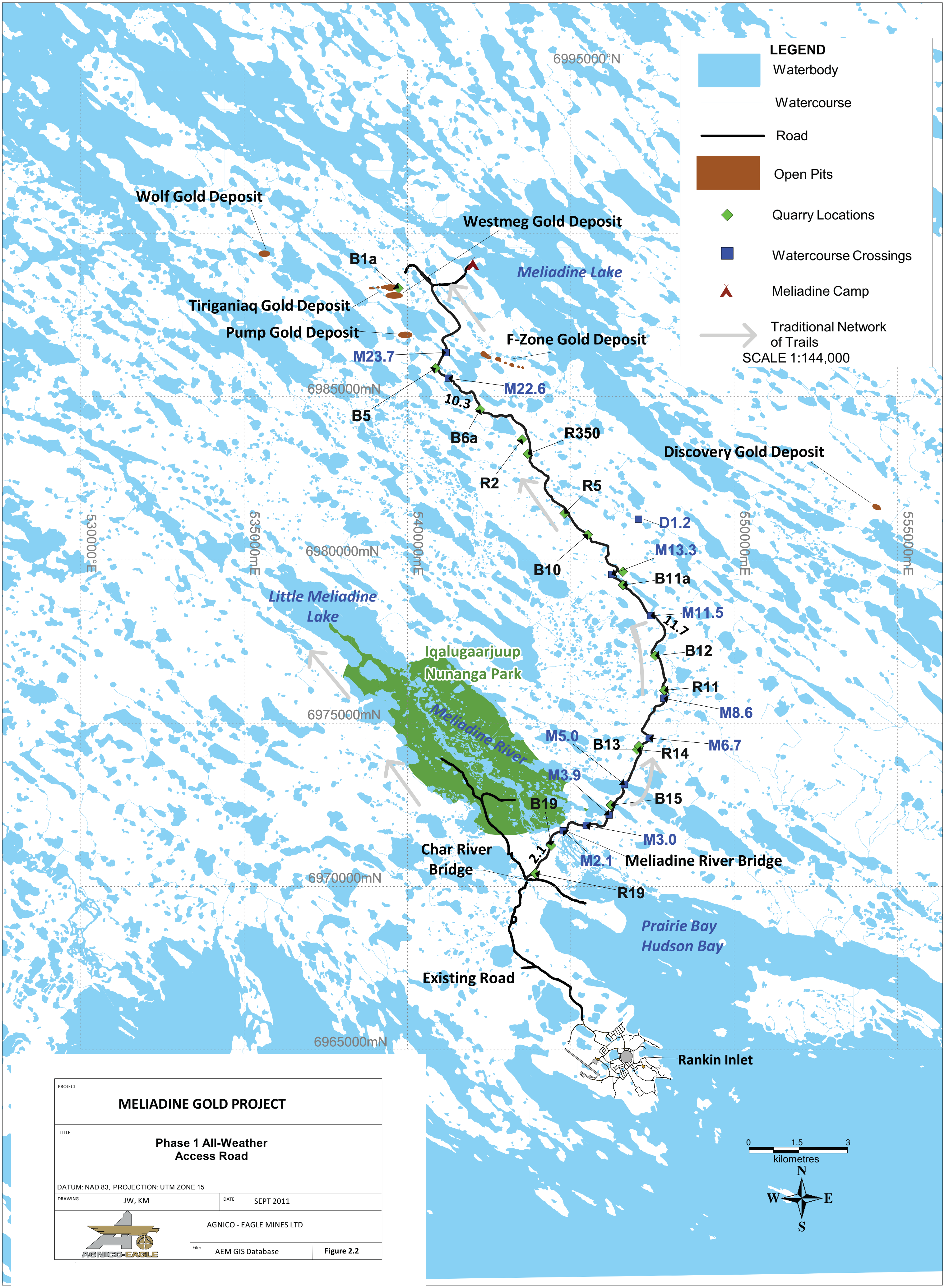

LEGEND
Waterbody
Watercourse
Road
Open Pits
Quarry Locations
Watercourse Crossings
Meliadine Camp
Traditional Network of Trails
SCALE 1:144,000
Wolf Gold Deposit
Westmeg Gold Deposit
B1a
Meliadine Lake
Tiriganiaq Gold Deposit
Pump Gold Deposit
F-Zone Gold Deposit
M23.7
6985000mN
M22.6
10.3
B5
B6a
R350
Discovery Gold Deposit
R2
R5
D1.2
530000°E
535000mE
540000mE
550000mE
555000mE
6995000°N
6980000mN
M13.3
B10
B11a
Little Meliadine Lake
M11.5
11.7
Iqalugaarjuup Nunanga Park
B12
R11
6975000mN
M8.6
Meliadine River
M5.0
B13
M6.7
R14
M3.9
B15
B19
M3.0
Char River Bridge
2.1
M2.1
Meliadine River Bridge
6970000mN
R19
Prairie Bay
Hudson Bay
Existing Road
6965000mN
Rankin Inlet
0
1.5
3
kilometres
N
W
E
S
PROJECT
MELIADINE GOLD PROJECT
TITLE
Phase 1 All-Weather Access Road
DATUM: NAD 83, PROJECTION: UTM ZONE 15
DRAWING
JW, KM
DATE
SEPT 2011
AGNICO - EAGLE MINES LTD
AGNICO-EAGLE
File:
AEM GIS Database
Figure 2.2

Figure 2-3 Phase 1 Proposed Road Construction Schedule

AGNICO-EAGLE MINES LTD

Meliadine Project

All Weather Project Access Road - PHASE 1

REVISION: 01
September 2011

ID	Nom de la tâche	Start	Finish
1	**MELIADINE PROJECT - AWR Phase 1**	**Wed 10-09-01**	**Thu 12-09-27**
2			
3			
4	**100 OFF-SITE INFRASTRUCTURE**	**Wed 10-09-01**	**Thu 12-09-27**
5			
6	**105 All Weather Road - Rankin to Meliadine**	**Wed 10-09-01**	**Thu 12-09-27**
7	Preliminaire road design - Golder	Thu 10-11-25	Fri 10-11-26
8	Advance road design - Ass. Eng.	Wed 10-10-27	Fri 11-01-21
9	Geotechnical Report Main Bridges - Golder	Mon 10-09-06	Fri 10-11-26
10	Preliminairy Bridge Design - Stavibel	Wed 10-11-24	Tue 11-01-25
11	Bidding Process - Main bridges (3)	Tue 11-01-25	Fri 11-03-18
12	Main Bridges (3) - Eng. / Fab. / Delivery	Mon 11-03-21	Fri 11-08-26
13			
14	Road Misc. Supplies - Purchase & Delivery	Mon 11-04-25	Fri 11-08-19
15			
16	**Winter Road to access bridges construction sites**	Mon 12-01-16	Fri 12-03-02
17			
18	Char River Bridge - Abutment Const.	Mon 12-03-05	Fri 12-04-27
19	Char River Bridge - Construction	Mon 12-04-30	Fri 12-05-25
20	Char River Bridge - Bridge open for road construction	Mon 12-06-04	Mon 12-06-04
21	Char River Bridge - Completion of Bridge Abutment	Mon 12-06-25	Mon 12-07-02
22			
23	Meliadine River Bridge - Abutments Const.	Mon 12-03-05	Fri 12-05-18
24	Meliadine River Bridge - Construction	Mon 12-05-14	Fri 12-06-15
25	Meliadine River Bridge - Bridge open for road construction	Fri 12-06-15	Fri 12-06-15
26	Meliadine River Bridge - Completion of Bridge Abutment	Mon 12-07-02	Tue 12-07-10
27			
28	Bridge M0.5 Location - Abutment and Construction	Mon 12-07-30	Fri 12-09-07
29	(Note: will not slow down AWR const if done 2012)	Wed 10-09-01	Wed 10-09-01
30			
31	Meliadine AW Road - Request for Proposal	Mon 11-04-18	Fri 11-05-27
32			
33	Meliadine AW Road - Const. Km 0 to 1.9	Mon 12-03-05	Fri 12-04-20
34	Meliadine AW Road - Const. Km 2.0 to Km 25	Mon 12-03-05	Thu 12-09-27
35	Meliadine AW Road Opened to AEM Traffic ONLY	Sat 12-09-15	Sat 12-09-15

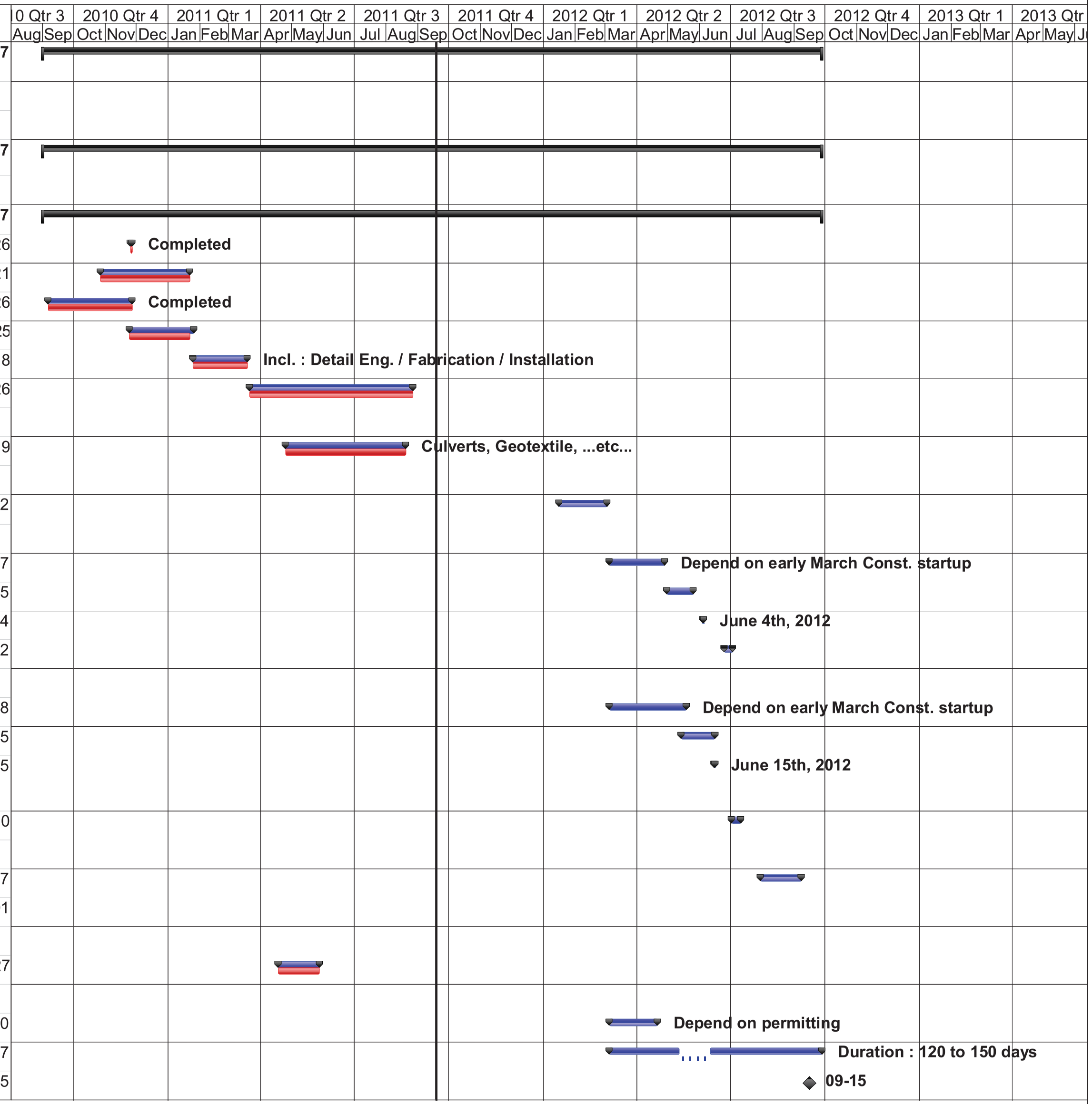


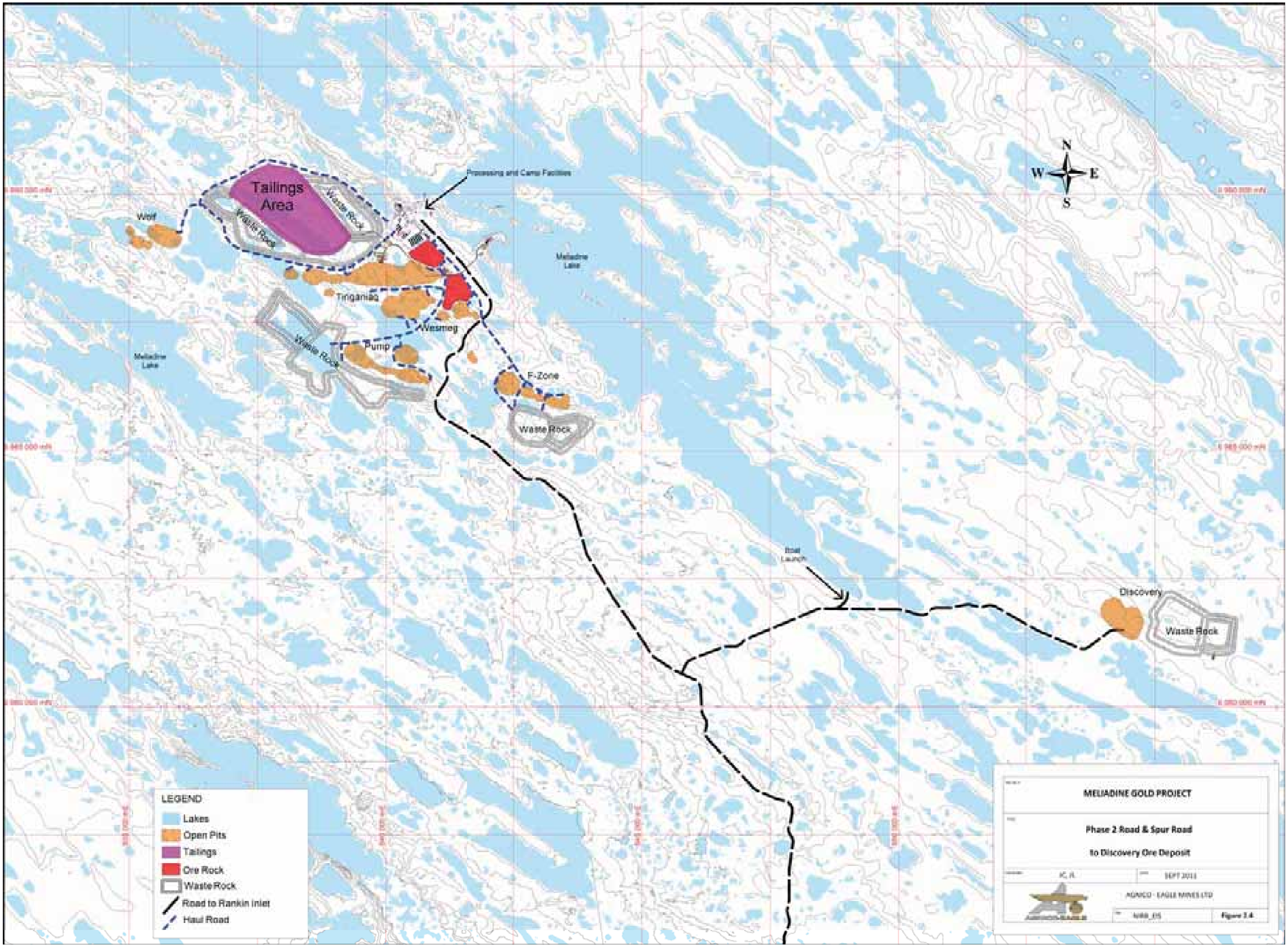
Figure 2-3 Proposed Phase 1 Development Schedule

2.4.2 Phase 2 All Weather Access Road from Rankin Inlet to the Mine Site

AEM plans to widen the Phase 1 road to two lanes and build the spur road to the Discovery gold deposit as part of the Phase 2 road development. This will follow receipt of the Project Certificate. The Phase 2 all-weather access road is illustrated in Figure 2-4 along with the spur road to the Discovery ore deposit. The anticipated time for the construction of the main road from Rankin Inlet is June to July 2014, and once completed, it will be opened to public access. At the same time part of the spur road to Discovery will be built to allow public access to Meliadine Lake. The rest of this road will be constructed before the Discovery ore body is mined.

The Phase 2 road, by way of a spur road to the Discovery ore deposit, will give residents of Rankin Inlet ease of access to areas of traditional use as well as camps and cottages around the lake. The Phase 2 road will only be built if and when the Meliadine Mine development successfully completes the environmental review being conducted by the NIRB and under a future Type A Water Licence Application to the NWB. The construction of the Phase 2 road will use the same quarries as the Phase 1 Road.

Road Design: The road design is detailed in the report "All Weather Access Road, Meliadine Gold Project, Feasibility Level Design, November 2010." It should be read in its entirety for a complete description of the road design.



Tailings Area
Waste Rock
Waste Rock
Wolf
Processing and Camp Facilities
Meliadine Lake
Tiriganiaq
Wesmeg
Pump
Waste Rock
Meliadine Lake
F-Zone
Waste Rock
Boat Launch
Discovery
Waste Rock
N
W
E
S
LEGEND
Lakes
Open Pits
Tailings
Ore Rock
Waste Rock
Road to Rankin Inlet
Haul Road
MELIADINE GOLD PROJECT
Phase 2 Road & Spur Road
to Discovery Ore Deposit
SEPT 2011
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Figure 2.4

The design was based on the largest vehicle that will travel on the proposed road frequently, a B-Train tractor-trailer unit (2.4 metres wide and 25 metres long). This is the same transport truck seen on all highways across Canada. The design elements and criteria are given in the table below.

Design Element	Criteria	Source / Comments
Widest Vehicle on Road	B-Train (2.4 m wide)	▪ Comaplex
Longest Vehicle on Road	B-Train (25.0 m long)	▪ TAC 2007[1]
Maximum Design Speed	50 km/h	▪ Based on similar projects
Minimum Road Width (2-way road, not including the shoulders)	8.0 m road width (plus 2 m width per safety berm where required).[3] The slope of the road shoulders will be 2H:1V.	▪ Meets or exceeds NWT 1995 & TAC 2007 ▪ Based on 2.4 m (96") vehicle width, 1.1 m tire height, NWT 1995[2] p. 35 and TAC 2007 p. 2.2.2.11
Road Alignment at Watercourse Crossings	Perpendicular to watercourse	▪ Based on similar projects ▪ Crossings -- 3 bridges and 9 using culverts
Road Section Method (Cuts and Fills)	Fill (No cuts)	▪ Based on similar projects. ▪ Selective use of quarry materials to minimize metal leaching.
Minimum Stopping Distance	110 m	▪ Based on trucks with conventional braking systems, TAC 2007. 1.2.5.4 ▪ For comparison, 65 m for trucks with antilock braking systems.
Super-elevation	None	▪ Based on similar projects.
Minimum Radius of Curvature	165 m	▪ Based on 50 km/h maximum design speed and 0.12 coefficient of friction between road surface and vehicle tire, TAC 2007 p. 2.1.2.7.
Maximum Slope Gradient	8%	▪ TAC 2007 p. 2.1.3.2.
Minimum Sag Curve "K" Value	12	▪ Based on stopping distance, TAC 2007 p. 2.1.3.8.
Minimum Crest Curve "K" Value	9	▪ Based on stopping distance, TAC 2007 p. 2.1.3.5
Drainage culvert or French Drain Frequency (for planning purposes, actual number to be determined in the field)	Every 50 metres for low ground; may not apply on high ground	▪ Based on similar projects
Offset from Archaeological Sites	30 m	▪ Nunavut Archaeological and Paleontological Sites Regulations (2003)

[1] Transport Association of Canada Geometric Design Guide for Canadian Roads 2007 [2] Nunavut/Northwest Territories Mine Health and Safety Act (NWT 1994) and Regulations (NWT 1995). [3] The most common width of a traffic lane in 3.7 metres on two-way highways.

Road signs will be properly positioned, legible and in compliance with standards for:

- Size, shape and colour;
- Sign placement and mounted height;
- Design and legibility – in English and Inuktitut; and
- Reflectivity level.

These will directly influence the safe use of the road.

Road Maintenance:

Inspection precedes maintenance. Good inspection programs will lead to the early identification of areas of the road where improvements are necessary. The early resolution of any deficiencies will result in less ongoing maintenance and repair of the driving surface.

The road and its shoulders are to be inspected weekly during the summer period for evidence of seasonal freeze and thaw adjacent to the toe of the road embankment. This is expected and may lead to longitudinal cracking and thaw settlement, especially for portions of the road founded on ice-rich soil. When such areas are discovered, the affected area would be repaired using granular material and/or crushed rock.

During the summer the road will be regularly graded, the frequency dependent on the condition of the driving surface. In the winter and if necessary, the road will be sanded to improve traction and increase safety.

Regular inspection activities of all watercourse crossings will consist of:

- Visual inspection of 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 manual removal of accumulated debris and reparation of damages as soon as possible.

- Visual inspection of upstream and downstream channels to identify bed erosion or scour around the watercourse-crossing structure. Particular attention will be paid to bridge abutments and abutment foundations, as they are vulnerable to scour and erosion. Maintenance will consist of the remediation of any detected problems and reparation of damage as soon as possible.

Following heavy or prolonged rainfalls, visual inspections of each watercourse crossing will be completed to identify potential risks to structural integrity, and to determine whether debris accumulation or erosion and scour have occurred, as described in the regular monitoring program. Results will be recorded. Remediation of any detected problems and necessary damage repairs will be undertaken as soon as possible.

The amount of dust generated along the road is dependent on the dryness of the road surface, the number of vehicles, their weight and speed, and maintenance of the driving surface. Regular grading of the road combined with the addition of granular material to the driving surface will be needed. This will improve road safety and also reduce the amount of dust. Dust can also be mitigated by maintaining posted speed limits. Close to camp and subject to approval, a dust suppressant may be applied to keep the dust under control.

Traffic Management:

The Phase 2 road will have an unmanned gate at its south end, which will be open in most instances to allow public use of the road. However, public use of the road will not be without restrictions. AEM will err on the side of caution and close the southern gate if there is a risk to public safety.

A system will be established to allow AEM to communicate current road closures to the public. This will include announcements on community radio, public information sessions, email alerts to a subscription list of interested parties, email alerts to the hamlet of Rankin Inlet and to the Kivalliq Inuit Association, and other methods of communication that are found effective through ongoing experience and consultation. AEM will have in place a written Meliadine all-weather road operating procedure that will be periodically reviewed and updated. This will set out the rules for all use of the road and the procedures that will be employed by AEM in operating and maintaining the road (similar to the road-operating procedure that AEM has in place at Meadowbank for the road between Meadowbank and Baker Lake). Once the road is in operation, copies of the procedure will be provided regularly to the hamlet office in Rankin Inlet, to the KIA office and to the HTO office in Rankin Inlet.

Manned control gates will be installed and operated at the northern end of the road (the Meliadine Project end of the road) and on the Discovery spur road near the development, to prevent unauthorized access by the general public into the active areas of the Project to protect public safety. Heavy mining equipment such as bulldozers, back hoes, loaders and the like will be used within the Project areas. The public will not be allowed uncontrolled access into active areas of the Project to protect them from inadvertent contact with work areas where Mine Safety regulations are in force.

The southern gate will be closed to public traffic under the following circumstances:

1. When the road and bridges are under construction;
2. When major maintenance activities occur, such as the repair of a bridge or repositioning of a culvert;
3. When the weather is deteriorating, during periods of low visibility, or when an impending storm is forecasted;
4. When a large number of animals are on or adjacent to the road. The road could also be closed upon the request of the Rankin Inlet Hunters and Trappers Organization;
5. When oversized loads are being transported. Such a load would be escorted by a lead vehicle and a following vehicle, warning other traffic of its presence. This is a normal practice on all roads. Even though the southern gate would be closed in this instance, the lead and following vehicles would accompany the oversized load all the way to the Meliadine site;
6. When heavy mining machinery has to use the road. The procedure mentioned above would be used. These would be infrequent occurrences. The only instance that comes to mind would be the movement of heavy equipment to the Discovery Ore zone located 22.4 km from the Meliadine mine site, or when such machinery is needed to repair the road.

Traffic management procedures common to all jurisdictions will be used during road grading, maintenance and snow removal. In both these instances signs will warn of the road work ahead; drivers will be required to reduce their speed to posted limits and approach the work zone with caution. If the road is reduced to one lane for a considerable distance, flag persons would be situated at either end of the work area to allow traffic flow. Drivers must be prepared to stop and wait for permission to proceed.

Road use by AEM and its contractors is not expected to vary as much as the public traffic between summer and winter. AEM and contractor vehicles expected to use the road will include, but not be limited to, pickup trucks, cube vans, buses, fuel trucks, tractor-trailers, snowplows and graders. However, the amount of traffic will be highly dependent on the level of activity on site and the time of year, such as when supplies and materials arrive by sea.

- Winter months
  - Weekdays – between eight and 10 pickup trucks, two cube vans, two passenger vans, two fuel trucks daily, one transport truck and zero vehicles when the weather is bad. Should flights not be able to get into Rankin Inlet, the number of passenger vans would drop to half this number.
  - Weekend days – between two and four pickup trucks, one cube van and one passenger van, one transport truck and zero vehicles when the weather is bad. Should flights not be able to get into Rankin Inlet, one passenger van would only transport local employees to the site.

- Summer months
  - Weekdays – between 10 and 14 pickup trucks, three cube vans, two passenger vans, two fuel trucks, one transport truck and zero vehicles when the weather is bad. Should flights be unable to get into Rankin Inlet, the number of passenger van would drop to one. Weekend days – between four and eight pickup trucks, one cube van, one passenger van, one transport truck and zero vehicles when the weather is bad. Should flights not be able to get into Rankin Inlet, one passenger van would only transport local employees to the site. When barges arrive at Itivia, between six and 14 transport trucks per day can be expected on the road to move the freight to the Meliadine site.

AEM expects to see the following public road-use pattern during the initial stages of the mine:

- Winter months
  - Weekdays -- one or two pickup trucks and five to 10 snowmobiles daily when the weather is good, dropping to zero vehicles when the weather is bad.
  - Weekend days – between two and five pickup trucks and 10 to 20 snowmobiles daily when the weather is good, dropping to zero vehicles when the weather is bad.
- Summer months
  - Weekdays – between two and five pickup trucks and five to 10 all-terrain vehicles (ATVs) daily when the weather is good, dropping to zero vehicles in bad weather. Weekend

days – between five and 10 pickup trucks and 10 to 20 ATVs daily when the weather is good, dropping to zero when the weather is bad.

We estimate that 25 per cent to 50 per cent of these trips will be incremental to current access, which is by ATVs and snowmobiles.

Emergency Response:

Emergency response is reactive, while prevention reduces the frequency of emergency responses. AEM's emphasis will be on prevention, while at the same time keeping resources close at hand in order to respond to emergencies on the road in a timely manner.

Three possible causes of road emergencies are the road, vehicles and people. The interplay of these three elements leads to either safe use of the road or emergency responses. AEM is fully responsible for the design, construction and maintenance of the road for private and public use. AEM will ensure that its vehicles are in good working order before they venture out on the road. As well, AEM will train its employees far more than any legal minimum; by educating and protecting its workers, some of whom will also use the road as members of the public, AEM will lead by example in road safety. However, it is only through education that AEM can influence members of the public in their choices of vehicle and behaviours on the road.

AEM will work to develop partnerships with the public, community organizations and government departments in educating the public about road safety, shaping good driving practices and influencing behaviour on the road. Emphasis will be placed on the use of helmets and seat belts; observing posted speed limits; improving visibility for others by wearing reflective clothing when on a snowmobile or ATV; not drinking and driving, and not driving while impaired; dealing with driver inexperience, etc. AEM will, however, have little influence on the vehicles that people choose to use on the road. Vehicles used by the public may suffer from poor maintenance, and individuals may also make poor choices, such as using an ATV in winter when a snowmobile would be more appropriate.

There will be accidents and malfunctions that occur on this road. Such unfortunate events are inevitable, no matter how much effort is devoted to preventing them. However, mitigation measures and response plans will be developed that can be applied to reduce the frequency and severity of such events. The types of events considered likely are as follows:

- Vehicle collisions that may result in personal injury and spillage of potential harmful materials such as fuel, lubricating fluids, antifreeze, etc.;

- Contact between vehicles and wildlife that may result in harm to wildlife, personal injury and spillage of potentially harmful materials, etc.;

- Single-vehicle accidents that may result in personal injury and spillage of potentially harmful materials;

- Risk of people getting stuck on the road in bad weather such as in heavy snow or whiteout conditions, or due to mechanical breakdown;

- Risk of accident due to an intoxicated or impaired driver on the road; and

- Spills of harmful materials onto the land or into water.

Emergency response equipment will be carried in all AEM vehicles using the road, in an effort to improve the response in the event of an incident or accident. This equipment includes survival gear, emergency first-aid equipment, and initial spill-response equipment.

AEM will respond to the following emergencies along the road:

- Vehicular Accidents – AEM emergency response personnel will be tasked to respond to any vehicle accident resulting in personal injury or spillage of harmful material. AEM will initiate extraction and transport to medical assistance at Rankin Inlet's medical centre. AEM would initiate spill-containment and cleanup measures;

- Spills – AEM emergency response personnel will be tasked to respond to any spills and to initiate spill containment and cleanup; and

- Reporting – AEM will report all reportable scale incidents to the appropriate government authority (e.g., Mines Inspector, Water Board, NU Spill Line, Environment Canada, GN Department of Environment, Fisheries and Oceans Canada, KIA and Rankin Inlet municipality).

Emergency response personnel and equipment will be available at all times on the Project site to allow for quick action should an accident occur. AEM will have a program to train and maintain personnel on site at all times who can respond and address all emergencies that may occur, such as personal injuries, fire, spills of harmful materials, etc. AEM will also have appropriate equipment and material available to equip its emergency response personnel.

An emergency shelter will be established at the midpoint of the road where individuals can seek refuge if they are trapped on the road due to poor weather, vehicle breakdown, or other conditions.

The Project site will have an emergency and spill response plan in place at its project at all times. This plan will be reviewed and updated periodically in order to learn from past experience. Emergency response personnel will be trained in the procedures and protocols contained in the Emergency and Spill Response Plans.

In conclusion, based on our experience with the road between Baker Lake and the Meadowbank Gold Mine, we know that accidents will periodically occur, but that the prevention and proposed mitigation measures, as well as emergency-response planning, training and preparation, will significantly reduce the risk, frequency and severity of such incidents.

Snow Clearing:

Sections of the Meliadine road are expected to experience snowdrifts because of strong winds over the winter period. As much as possible this snow will be cleared to the downwind side of the road to limit the redepositing of the same snow on the cleared road. Routine spring snow management will include the removal of any snow that accumulates at bridges and culverts so that water at freshet time can move freely through the culverts and under bridges. In the case of culverts, snow will be removed from both ends but not from the inside.

The report "Preliminary Snow Drift Assessment of the Meliadine All Weather Road from Rankin Inlet to the Meliadine Site, Nunavut" provides an assessment where snowdrifts can be expected. It states:

> *"Observations seem to indicate that snowdrifts can be expected on the lee of short, steep slopes and along lakeshores."*
>
> and
>
> *"Maintenance will be required during operations to manage snow accumulation along the road alignment; however, most of the alignment appears to be located along the windward slopes and ridge crests where there should be a limited tendency for snow to build up."*

The design of the road has factored in snow accumulation, and this is one of the reasons the road is located along the height of land as much as possible and in a northerly alignment.

Policing, By-law and Regulatory Enforcement:

The hamlet of Rankin Inlet can pass and enforce bylaws on the first two kilometres of road on municipal land. AEM does not intend to have the RCMP police the road. Instead, AEM will concentrate on raising public awareness of, and commitment to, road safety, and on improving communication, co-operation and collaboration among all stakeholders on the safe use of the road. Regulatory inspectors can inspect the road and any associated infrastructure at will. AEM will abide with the recommendations and directives provided by inspectors.

Periodic patrols of the road will be undertaken by AEM security personnel to enforce road safety rules where appropriate. Also, all AEM vehicles using the road will have two-way radios to inform AEM security of unsafe practices seen along the road, and to allow a quick response to unsafe conditions by maintenance personnel.

It is worth noting that the Criminal Code of Canada applies to private roads. For example, if an accident were to occur on the road and alcohol was implicated, that person could be charged by the RCMP.

Finally, AEM requires that all plans, drawing and documents related to the design and construction of the road are stamped by an engineer registered in the NWT/Nunavut. This requirement assures AEM that the road is built to generally accepted engineering standards for roads in permafrost areas in the NWT and Nunavut.

2.4.2.1 Spur Road from the F Zone Deposit to Main Access Road

A haul road following the shortest distance will connect the F Zone deposits with the mill as shown in Figure 2-7. The road will be an all-weather road primarily used to haul ore to the mill, and to transport workers, equipment, and supplies to the F Zone area.

2.4.2.2 Spur Road from the Discovery Deposit to the Main Access Road

Access to the Discovery deposit will require a 9.4-kilometre-long spur road from the main access road, as shown in Figure 2-4. Initially, approximately 3.4 kilometres of this spur road will be built to the edge of Meliadine Lake. This will allow ease of access to Meliadine Lake by the residents of Rankin Inlet. The rest of the road will be built before the Discovery pit is to be mined, from approximately 2020 to 2025.

2.4.2.3 Spur Roads from the Wesmeg, Wolf and Pump Deposits to the Mine Roads

The Wesmeg, Wolf and Pump deposits are all close to the proposed mine infrastructure, and will require short stretches of road to connect them to the mine roads. Details on the final routing of these roads will emerge from the feasibility study.

2.5 Mine Site Infrastructure

2.5.1 Design Basis

The Meliadine project has sufficient surface lands available to allow for flexibility in the project design, should the need arise. The surface rights are currently held by AEM under a surface lease obtained from KIA. The current lease is a Commercial Exploration Lease that will be converted into a Commercial Production Lease once the project has successfully completed an environmental assessment and received the required authorizations, permits and leases from the various regulatory agencies. The granting of a Commercial Production Lease is predicated upon the negotiation and implementation of an Inuit Impact Benefits Agreement.

The Meliadine infrastructure will follow typical Arctic construction practices, be similar to the Meadowbank mine, and be designed to have a minimal footprint. The Arctic design of the buildings will be reflected notably in insulation and special foundation requirements, use of heated utilidors (insulated, enclosed utilities corridors) to connect the buildings, and extreme space-heating requirements. The infrastructure will be compact in size to minimize construction costs and to maximize heat and fuel conservation and efficiency. The site experiences strong winds from the north-northwest, especially in winter, and snowdrifts tend to form downwind of obstructions. The mine site's major structures will be oriented with this in mind.

Space-heating requirements could be met through the recovery of waste heat from the diesel engines driving the power generators. Auxiliary glycol/water-heating boilers will be provided for heating requirements in extreme conditions and emergencies. Another climate-driven feature of the infrastructure will be the heat-tracing of fuel, water and tailings lines.

An assessment of the seismic hazard for the Meliadine site indicates that the proposed development lies within Seismic Zone 0 of the current National Building Code, so there is negligible risk of an earthquake or other seismic event.[5]

The "active" layer of soil in the overburden—the layer that freezes and thaws annually—is within one or two metres of the surface; consequently, in places where the bedrock is less than two metres below the surface, the foundations of buildings and heavy equipment will rest directly on bedrock, without the need for piles or extensive structural fill. For concrete foundations, experience has shown that bedrock tends to shatter when excavated in Arctic climates. Therefore, allowances will have to be made for pouring lean concrete and using rock dowels to stabilize these foundations. Where the bedrock is deeper than three metres, the foundations will be supported by pilings.

To avoid creating an aggregate quarry simply for construction material, the Tiriganiaq open pit will be developed at the outset of construction, in conjunction with the predevelopment of the underground mine. Suitable waste rock from these two sources will be used in constructing pads, roads and dikes. The waste rock and till material could also be used to make aggregate for concrete.

The Meliadine Gold Project's main infrastructure, mineral-processing facilities and employee accommodation complex would be built about two kilometres northeast of the Tiriganiaq deposit (approximately 1.2 kilometres northwest of the exploration camp). This infrastructure will be modelled after that at the Meadowbank mine. The proposed general layout of the site and location of its infrastructure are shown in Figures 2-5 and 2-6, respectively. Greater detail for the F Zone and Discovery deposits, and their associated infrastructure, is presented in Figures 2.7 and 2.8, respectively.

Details about the construction of the proposed Meliadine gold mine will emerge from the feasibility study, but the following information on general site layouts and construction is applicable. It is

[5] Seismic zone information from the Geological Survey of Canada's Pacific Geoscience Centre.

anticipated that approximately 50,000 tonnes of equipment and materials will be moved to the site during a construction period of two to three years.

2.5.2 Construction Infrastructure

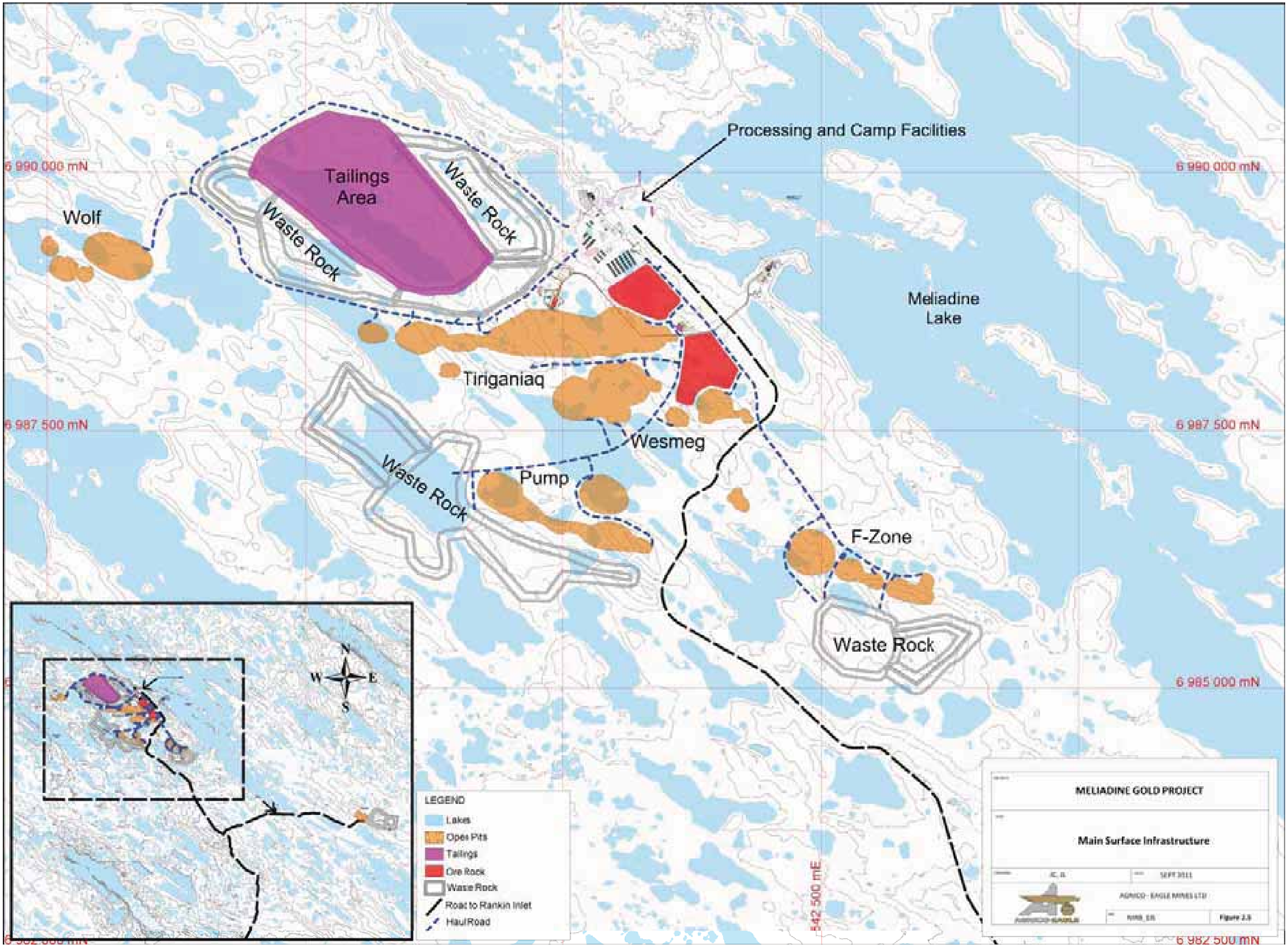
The existing 150-person exploration camp could be enlarged to house up to 250 persons during construction if required. Additionally, a temporary construction camp is also under consideration. The accommodation complex will be the first permanent structure completed. It and the exploration camp will serve to accommodate the 700 to 800 persons required at the peak of construction. The mine's construction phase will require a concrete batch plant, maintenance shops, offices, warehouses, workshops and temporary power generators.

The fuel storage currently approved for the site will suffice during construction if the Phase 1 all-weather access road to Rankin Inlet is in place. The 50,000-litre, double-walled fuel storage tanks and fuel bladders will be removed once the permanent tank farm has been completed; however, one of these tanks could be moved to the F Zone and later the Discovery deposit, for use during open-pit mining.

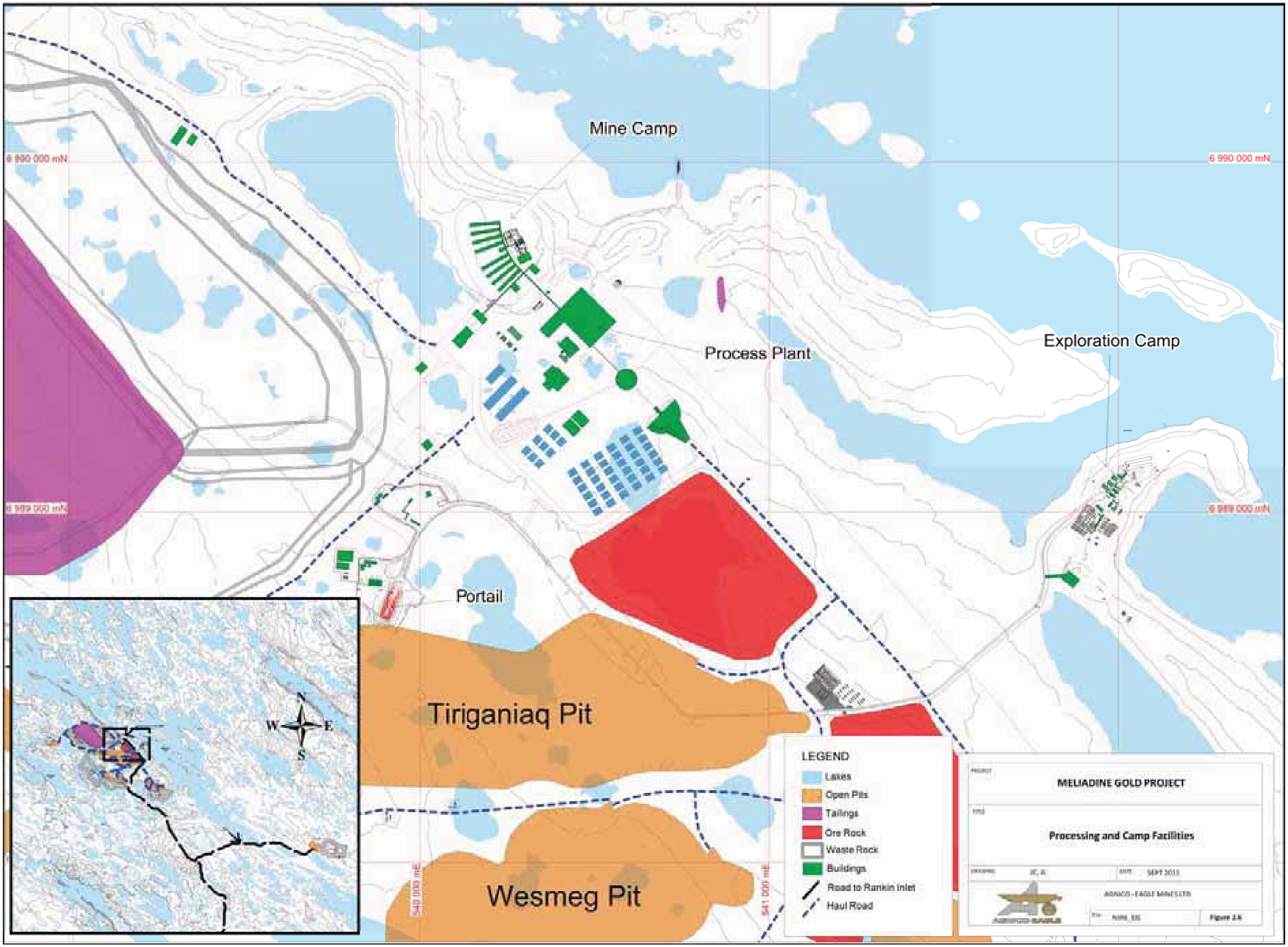
2.5.3 Main Processing Facilities

The mill complex will be the largest building on the site. Condemnation drilling for the mine infrastructure was completed in 2011 to ensure that there is no mineral potential under the preferred locations for this complex. The process of condemnation drilling will be outlined in the draft EIS.

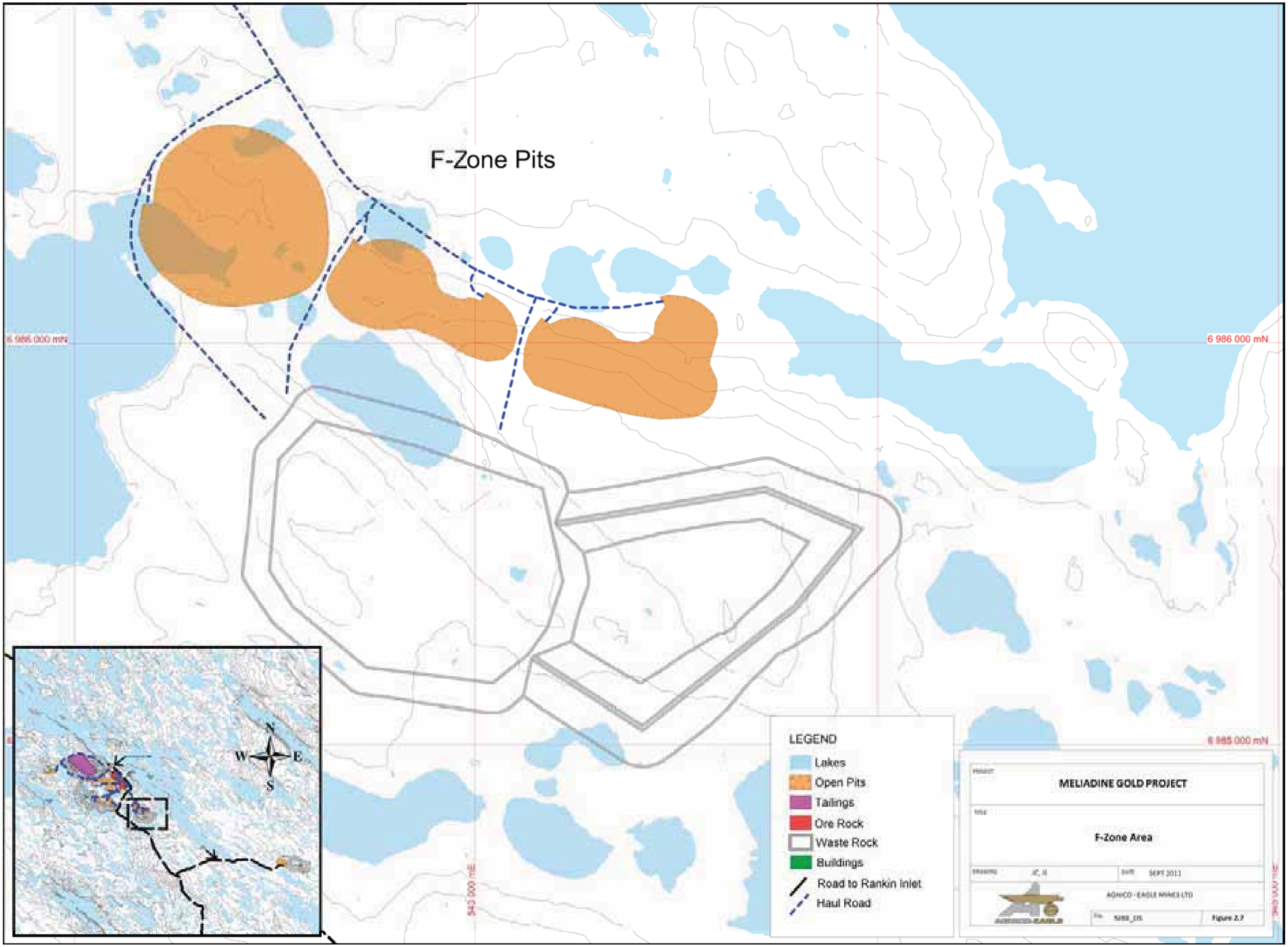
The infrastructure will be centrally located among the mining sites, but also situated more than 750 metres from the open pits, thereby providing a measure of safety from fly rock. The plant is designed to be compact, primarily to reduce the cost of site preparation and pad-building, but also to reduce the project's overall footprint.

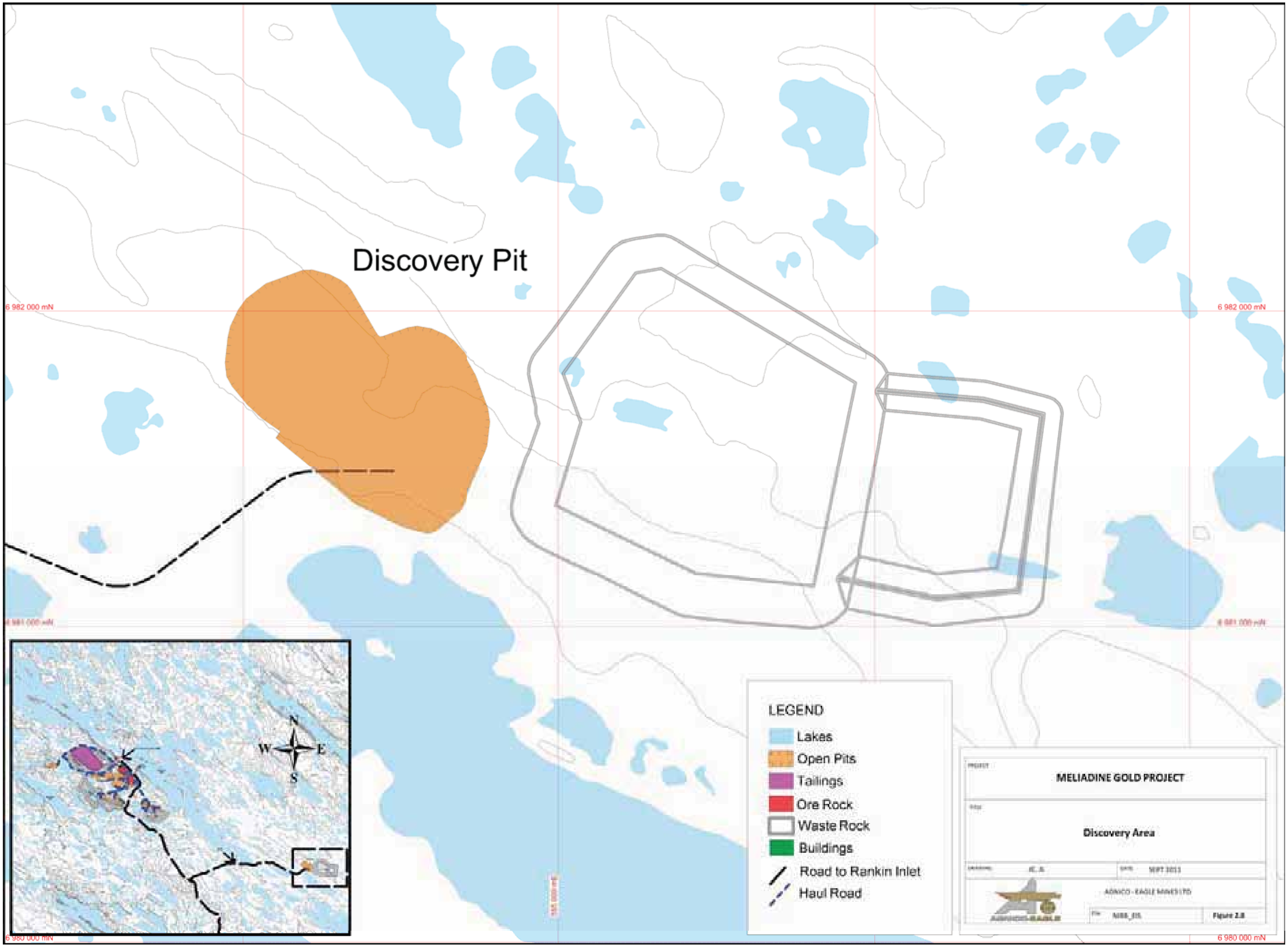


Processing and Camp Facilities
6 990 000 mN
6 990 000 mN
Tailings Area
Waste Rock
Waste Rock
Wolf
Meliadine Lake
Tiriganiaq
6 987 500 mN
6 987 500 mN
Wesmeg
Waste Rock
Pump
F-Zone
Waste Rock
6 985 000 mN
N
W
E
S
LEGEND
Lakes
Open Pits
Tailings
Ore Rock
Waste Rock
Road to Rankin Inlet
Haul Road
542 500 mE
MELIADINE GOLD PROJECT
Main Surface Infrastructure
SEPT 2011
AGNICO - EAGLE MINES LTD
6 982 500 mN



Mine Camp
Process Plant
Exploration Camp
6 990 000 mN
6 990 000 mN
6 989 000 mN
6 989 000 mN
Portail
Tiriganiaq Pit
Wesmeg Pit
540 000 mE
541 000 mE
N
W
E
S
LEGEND
Lakes
Open Pits
Tailings
Ore Rock
Waste Rock
Buildings
Road to Rankin Inlet
Haul Road
MELIADINE GOLD PROJECT
Processing and Camp Facilities
SEPT 2011
AGNICO-EAGLE MINES LTD
Figure 2.6


F-Zone Pits
6 986 000 mN
6 986 000 mN
6 985 000 mN
543 000 mE
W
E
N
S
LEGEND
Lakes
Open Pits
Tailings
Ore Rock
Waste Rock
Buildings
Road to Rankin Inlet
Haul Road
MELIADINE GOLD PROJECT
F-Zone Area
SEPT 2011
Figure 2.7



Discovery Pit
6 982 000 mN
6 982 000 mN
6 981 000 mN
6 980 000 mN
N
W
E
S
LEGEND
Lakes
Open Pits
Tailings
Ore Rock
Waste Rock
Buildings
Road to Rankin Inlet
Haul Road
MELIADINE GOLD PROJECT
Discovery Area
SEPT 2013
AGNICO - EAGLE MINES LTD
Figure 2.8

The project's mineral-processing facilities will consist of three main areas: the primary crusher; the crushed ore stockpile under a dome; and the mill building that will house the rest of the ore-processing equipment.

These three areas will be linked by conveyor tunnels to transport the crushed ore to the mill building. The foundations of these facilities will be concrete, extending to bedrock wherever possible; rock dowels will be used to decrease the amount of concrete required for the mill foundations. The floor will be a concrete slab on grade, over well compacted structural fill. All foundations will be insulated above bedrock to preserve the permafrost.

2.5.4 Power Plant and Heat Recovery

The Meliadine site power station will be a diesel-fuelled generation facility using multiple medium-speed reciprocating engines housed in a powerhouse, complete with heat recovery and all auxiliary equipment. The power output is rated to meet the process plant, ancillary support loads and the camp requirements. Two additional spare units will be installed so that any two units can be on standby and/or out of service for maintenance or repair. The location of the power plant is shown in Figure 2-6.

The power plant will be a pre-engineered insulated building constructed on pile foundations or on competent bedrock. The powerhouse is designed to accommodate nine Wartsila 3.8-MW units for a total of 42.7 MW of installed power. At the current mining rate, this meets the anticipated power requirement, calculated to be 29.6 MW with three units operating at 85 per cent of full load, excluding the two standby units. The engines are most efficient when operating in the range of 75 to 90 per cent of full load.

The power station will be located adjacent to the largest loads, which are located in the grinding area of the process plant, to minimize both power losses and capital cost. The fuel specified will be Arctic-grade light fuel oil (LFO). The fuel will be delivered to the daily feed tank beside the powerhouse from the Meliadine 5.6-million-litre fuel tank farm area via pipelines.

Waste heat from the diesel power plant high-temperature loop (jacket water, oil cooler and after cooler) will be recovered to provide total space heating and domestic water heating. The heat circulation medium will be a 50-per-cent ethylene glycol/water mixture. Heat will be recovered from the high-temperature loop and will enter the heat exchanger at about 85°C. Excess heat will be dissipated through an outside air-cooled fluid cooler. Each diesel generator set will include an engine-driven after-cooler pump that will circulate the water through an external after-cooler heat exchanger. Low-temperature loop heat recovery will serve the powerhouse air supply system, and the excess will be used for heating domestic water.

2.5.5 Fuel Storage

A single tank storing approximately 5.6 million litres of diesel fuel will be installed in a lined, bermed and contained area. It will be located near the power plant, convenient to the power generators, mining operations and plant facilities. The design of its foundation will involve the placement of structural fill to insulate the underlying bedrock and promote good drainage.

Fuel will be delivered by trucks on the proposed all-weather access road from Rankin Inlet to the tank at the Meliadine plant site. A fuel-dispensing station for the mine's mobile equipment, fuel trucks and light vehicles will be provided. The storage tank will meet American Petroleum Institute specifications and be constructed of cold-temperature-resistant steel.

In addition to diesel, the tank farm will also hold small amounts of gasoline, other fuels and oils. The 50,000-litre double-walled tanks for Jet A fuel will remain at their existing location near the Meliadine exploration camp for helicopter use. Propane or natural gas may be used for camp cooking and, if used, will be stored in a bulk tank.

2.5.6 Assay Lab

The assay laboratory will include a sample preparation room, balance room, fire-assay room, sample receiving area and an office for the chief assayer. The laboratory will operate 24 hours per day, seven days per week, and will be able to handle all samples from the mine and process plant, including bullion assays. The laboratory will also be equipped to perform grade-control assays and simple environmental analyses.

2.5.7 Accommodation Complex

Employees of the Meliadine project will be recruited from across the Kivalliq region and the rest of Canada. Due to the remote location of the site, it will be necessary to provide catered accommodation. The accommodation complex will be similar to those at other remote mines, with rooms for resident employees and short-term contractors. The accommodation complex will be the first permanent building constructed. To shorten the construction time, the building will arrive on-site in modules, allowing quick assembly. Once completed, this building, the proposed temporary construction camp and the exploration camp combined will house between 700 and 800 people at the peak of construction, including workers for the underground and open-pit development. (These numbers may change if the feasibility study produces a different estimate.)The accommodation complex will have dormitory wings linked to a building that combines a reception area, security office, kitchen, dining room and recreational facilities. All modules will be connected with Arctic corridors. The complex will meet the National Building Code of Canada Group C fire safety and occupancy requirements. The dormitory will have eight wings, with a capacity of approximately 550 beds.

2.5.8 Sewage Treatment Plant

A sewage treatment plant will be built capable of treating all human, kitchen, laundry and other liquid wastes. The final effluent from the sewage treatment plant during construction and mining operations will be directed to a small pond near the main infrastructure before draining to Meliadine Lake. Final details will be provided in the draft Environmental Impact Statement.

2.5.9 Support Infrastructure and Equipment

The support infrastructure and equipment anticipated for the project includes, but is not restricted to, the following:

- Fresh water pumphouse at Meliadine Lake (see section 2.13.1 for details).
- Waste-management building housing a high-efficiency incinerator and other waste-management processing equipment.
- Mine maintenance shops.
- Workers' dry
- Main warehouse.
- General outdoor laydown areas.
- On-site roads with drainage control.
- Explosives magazines.
- Buildings for mixing and storing explosives.
- Mixing plant for cement slurry and/or cement paste.
- Gatehouse and gate where the all-weather road enters the mine area.
- Vehicles, including buses, ambulance, fire truck, snowplow, fuel trucks, forklifts, bobcats, pickup trucks, all-terrain vehicles and others.

2.6 Underground Development

At present, Tiriganiaq is the only deposit scheduled to have an underground development. Based on the current geological understanding of the Meliadine deposits, some portion of the resources to be mined in the future will be accessed by underground methods. Drilling at Wesmeg and F Zone has been encouraging, and an underground development at these locations cannot be discounted. Further diamond drilling to depth will confirm whether this is the case. Similarly, the extent of drilling at the other gold deposits is currently inadequate to rule out underground developments sometime in the future.

Underground mining generates less waste rock, and thereby causes less surface disturbance than open-pit mining. One challenge presented by underground mining could be the management of groundwater when mining activity reaches deeper than the permafrost.

Typical underground mining equipment will be used, and a proposed equipment fleet is presented in Table 2.3. The results of the forthcoming feasibility study could cause numbers and types of equipment to change.

Table 2-3 Underground Mining Equipment Fleet

Quantity	Type of Equipment
4	Two-boom, electric-hydraulic development jumbos
1	Single-boom, electric-hydraulic stope jumbos
2	Longhole drilling rigs
3	3-4-yard scooptrams

6	6-7-yard scooptrams
1	Mobile rockbreakers
1	Grader
8	Jeeps
3	Materials/modular trucks
2	Scissor lifts
5	40-ton mine haul trucks
2	Explosives trucks
4	Screening/bolting rigs
2	Service trucks

2.6.1 Underground Mining – Tiriganiaq Deposit

The underground mine at the Tiriganiaq deposit will use part of the existing decline built during the 2007-2008 underground exploration and bulk-sampling program. This decline is to be extended to a depth of 400 metres in 2012-2013. A new portal will be built closer to the mill, since the present one is located within the footprint of the future Tiriganiaq open pit. This is shown in Figure 2-6. A conveyor belt is to be built to deliver the ore directly from the underground to the dome or close to it. This will necessitate that a crusher be located underground to reduce the ore to a size that can be accommodated on the conveyor belt.

The underground mine will employ conventional technology, using rubber-tired diesel machinery and drill-and-blast excavation. Mined-out workings will be backfilled for reasons of ground stability, using coarse rock waste, cemented waste rock, paste tailings, or some combination of these.

The mine will be ventilated using three or more ventilation raises. The ventilating air flow and required fan power will be defined as part of the feasibility study when the final underground layout, and consequent resistance to air flow, are known in better detail.

Drilling has shown that permafrost persists to depths of between 350 and 450 metres from the surface. The early stages of the proposed mine will, therefore, be almost entirely situated in permafrost. Later in the mine's life, it is expected that the mining infrastructure will descend below the lower level of the permafrost, and will then have to deal with any groundwater encountered. The 2007-2008 underground exploration program did not encounter any ground ice in the bedrock. Recent hydraulic conductivity testing (2009) indicates that below the permafrost, the permeability of the rock will be low. The quality and quantity of water will be better known upon completion of deep test holes in 2011 for the collection of temperature data and groundwater samples, and testing of hydraulic conductivity at depth. This will be followed by groundwater modelling. The results of this work will be presented in the EIS.

2.7 Open Pit Development

Figure 2-5 shows the approximate footprints of the open pits proposed for the Tiriganiaq, Wesmeg, Pump, F-Zone and Wolf deposits. Management areas common to the five deposits are planned for low-grade ore and waste rock/overburden. A management area for low-grade ore and waste rock/overburden will be located at the Discovery development area as shown in Figure 2.8. Temporary repair shops for equipment maintenance and fuel storage for open-pit mining operations will also be located at Discovery.

Conventional surface mining using drill-and-blast excavation and truck haulage is proposed for all six near-surface gold deposits. The preliminary selection of the surface mining fleet is presented in Table 2-4. The numbers and types of equipment could change as a result of the feasibility study.

Table 2-4 Open-Pit Mining Equipment Fleet

Quantity	Item	Specification
7	Production drill	76-178 mm bit
1	Backhoe excavator	3 m^3 bucket
1	Backhoe excavator	6 m^3 bucket
2	Loader	5 m^3 bucket
2	Loader	12 m^3 bucket
25	Truck	100 ton
1	Truck	50 ton
4	Grader	7.3 m blade
2	Trackdozer	310hp
6	Trackdozer	410hp
1	Wheeldozer	354hp
1	Water truck	
6	Production Backhoe	10 m^3 bucket
1	Truck & Float	
20	Pickup truck	
1	Bus	
1	Snowplow	

2.7.1 Tiriganiaq Surface Mining

The gold mineralization at the Tiriganiaq deposit extends to the bedrock surface. This will allow the upper part of the Tiriganiaq deposit to be selectively mined from an open pit. Figure 2-5 shows the general location of surface mining at Tiriganiaq. The haul distance from the main Tiriganiaq pit exit to the crusher will be about two kilometres, depending on the final layout of the infrastructure, pit ramps and haul roads. The feasibility study will contain further details. All waste rock is currently categorized as non-Acid Rock Drainage (ARD) type. The waste rock that meets the requirements for building material will be crushed, screened, and used for the construction of tailings dikes, foundations, laydown pads and roads. Use of the waste rock in construction will take into account that leachate draining from the waste rock might contain some trace metals, such as arsenic and copper, in concentrations that exceed Canadian Water Quality Guidelines for the protection of freshwater aquatic life. Separate waste-management procedures are proposed for the ARD and non-ARD material should any ARD rock be found in continuing studies.

As a result of the thick (approximately 20 metres) overburden on top of the Tiriganiaq deposit, prestripping will be required in order to expose the mineralized rock for mine production. The stripped material will be used for construction where possible. If not suitable for construction, this overburden will be stored with the waste rock.

2.7.2 Wesmeg Surface Mining

The Wesmeg gold deposit was found in 2010 and is about 300 metres south of the Tiriganiaq deposit. Presently a series of small open pits will be aligned in an east-west direction, following the banded iron formation that holds the gold deposit. The deposit is open in all directions, and only after additional exploration drilling will the full extent of the open pits be known. Further drilling will follow the feasibility study and the results will be presented in the draft EIS.

2.7.3 F Zone Surface Mining

The F Zone deposit is located approximately 5.1 kilometres southeast of the Tiriganiaq deposit by road. Several potential open pits, 50 to 100 metres apart, have been defined; they are presented in Figure 2.7 along with their associated infrastructure.

In order to excavate the westernmost pit at F Zone, a small bay of Lake A6 would be closed by a 250-metre long dike and subsequently dewatered. The water is less than one metre deep at the location where the dike would be placed. Water flow into Lake A6 would either be pumped around the development for a short term, or a water diversion channel would be built to allow water to flow around the development and provide for fish migration and fish habitat.

2.7.4 Wolf Surface Mining

The Wolf gold deposit is located approximately six kilometres west of the Tiriganiaq open pit. As with the other deposits, ore extends to the surface, which would allow open-pit mining after removal of the overburden. The full extent of the resource envelope encompassing this deposit remains unknown, and further drilling will be required before its size is known. Further drilling will follow the feasibility study and the results will be presented in the draft EIS.

The Wolf deposit will use the waste rock/overburden management areas common to the Tiriganiaq and Wesmeg deposits. As shown on Figure 2-5, a haul road around the waste rock management area could possibly be used as the route linking the Wolf mining area to the mill area further to the east.

2.7.5 Pump Surface Mining

The Pump gold deposit is about three kilometres south of the Tiriganiaq open pit. As with the Wolf deposit, there has been insufficient drilling to fully define the extent of the resource envelope. However, drilling to date indicates that open pits are feasible for this deposit, and more drilling in the future will allow the sizes of the open pits to be better defined.

The open pits would use the waste rock/overburden storage areas common to Tiriganiaq and Wesmeg. A haul road will be developed linking the deposit to the nearby haul roads as shown in Figure 2-5.

2.7.6 Discovery Surface Mining

The Discovery deposit is located approximately 22.4 kilometres east-southeast of the proposed main site. It has the potential to be mined as a satellite deposit when mining at and around the Tiriganiaq pit is winding down.

The road to the Discovery deposit, the pit outline, and the waste rock/overburden management area are shown in Figures 2-4 and 2-8. Several small lakes are in the immediate area of the proposed Discovery pit or the waste/overburden management areas.

2.8 Tailings impoundment area

An evaluation of options for tailings disposal at the Meliadine project (Golder Associates, 2009a) first compared ten location/type (slurry or paste) disposal possibilities. For each option, factors such as environmental protection, mining operations, socio-economic concerns, and the eventual closing of the mine were taken into consideration and rated in a decision matrix. The Golder study also included a review of tailings management methods in cold climates.

The study concluded that the preferred option is thickened slurry[6] disposal in Lake B7, combined with an adjacent land area east of Lake B7. This option would allow the disposal of ~~7.7~~ 32.3[7] million cubic metres of tailings[8] wherein ice formation within the tailings would add 20 per cent to the volume. This represents the total volume of tailings to be disposed over the 10-year life of the mine. This option would involve dewatering Lake B7, building on-land dams and staging the construction of tailings dams around Lake B7 during the mining operations. Based on the available bathymetry, Lake B7 has a volume of about 860,000 cubic metres. (Golder Associates, 2008c)

After AEM obtains a Schedule 2 listing under the Metal Mining Effluent Regulations and receipt of all other relevant approvals, Lake B7 would be fished out and subsequently dewatered by pumping water

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[6] Thickened slurry contains 55 per cent to 60 per cent solids.
[7] This represents the total volume of tailings from processing over the mine's 10-year life.
[8] 39.3 million tonnes of tailings at 1.2 tonnes per m³ dry density. (The tonnage of ore to be processed over the 10-year life of the mine has been determined to be approximately 39.3 megatonnes.)

downstream in the basin. Options for dewatering and water treatment are being investigated. Discussions with Fisheries and Oceans Canada indicate that fish-habitat compensation will be required, and studies are under way to determine how best to fulfill this requirement. As well, a program to monitor environmental effects will be developed.

Preliminary work suggests that the TIA dike crest elevation will vary from 70 to 80 metres, with a crest width of 12 metres. A haul road would be constructed from the Tiriganiaq open pit and waste-rock/overburden management areas to the tailings impoundment area, and would continue around its perimeter. Construction of the tailings impoundment area will be phased in accordance with the mine production schedule and the availability of waste rock from mining as construction material. Dike construction would be supplemented with till material.

Geotechnical investigations were started in 2009 for the proposed Lake B7 dam alignment (Golder Associates, 2010). More geotechnical work will be done once the final tailings management option is selected.

2.9 Low-Grade Ore Stockpiles, Pads, and Waste Rock/Overburden Management Areas

The proposed locations of the management areas for low-grade ore stockpiles, pads, and waste rock/overburden are intended to minimize any short- and long-term environmental impacts, and to optimize the mining operation accordingly. The geotechnical drilling and mapping of each area is nearing completion, and the final layouts of these areas is shown in Figures 2-5 and 2-6.

A run-of-mine (ROM) ore stockpile will be located near the primary crusher.

2.10 Preferred Options and Alternatives

2.10.1 Project Description and Project Status

The information and concepts presented in this project description are based on the NI 43-101-compliant technical report on the Meliadine gold deposit completed in March 2011. That document synthesized all available information on the Meliadine project, including the 2001 prefeasibility study completed for WMC International by independent consultant Beca Simons Pty Ltd. (now Beca AMEC), and the 2009 “Independent Technical Report on the Preliminary Assessment of the Meliadine Project, Nunavut, Canada,” by Micon International.

In 2009, Comaplex compiled all available information and used experienced independent consultants to update the studies. A feasibility study is currently under way for completion in 2012. The draft EIS will incorporate information from the feasibility study.

2.10.2 Mining Options

Gold deposits on the Meliadine property will be mined by a combination of open-pit and underground methods. The feasibility study will determine the number, size and depth of all open pits. The current plan for the proposed mine calls for open pits at all six gold deposits, with underground mining at the Tiriganiaq deposit and possibly the Wesmeg and F Zone deposits. Underground mining cannot be discounted at the other three deposits, since drilling to date is insufficient to rule it out.

2.10.3 Tailings Impoundment Area Alternatives

Four quadrants centred on the present portal were first investigated (Golder Associates, 2009a) for the tailings impoundment area. These included Lake A54, Lake A8 and Lake B7. Fisheries work in 2010 indicated that all of the sites would adversely impact fish habitat and would require a Schedule 2 listing under the Metal Mining Effluent Regulations. No single area in the vicinity of the mine could be found where adverse impacts on fish habitat could be avoided. In all cases, a fish habitat compensation plan will be required.

As stated in Section 2.8, Lake B7 was first selected as the preferred tailings impoundment area. The proposed earlier mine would have processed 3,000 tonnes per day of ore and its 10 million tonnes of tailings over the mine life could have been accommodated in the Lake B7 basin. As a result of AEM’s 3,000-tpd feasibility study, the area of land adjacent to Lake B7 basin was added, as shown in Figure 2-5.

AEM considered the storage of tailings material in one of three forms:

- A conventional slurry having a high water content (50 per cent solids);
- A paste[9] or thickened tailings with a medium water content (68-70 per cent solids); or
- A solid (filter cake) with a low water content (85-92 per cent solids).

The slurry option is the most common method of storing tailings. It is proven technology and well understood. However, this method requires an allowance of approximately 20 per cent of the volume of the tailings impoundment area to compensate for loss to the formation of ice lenses in the tailings. Dewatering the tailings would have some advantages, notably in reducing the entrainment of ice; this would help to reduce the storage volume needed for the tailings. However, dewatering requires specialized equipment and transporting dewatered tailings may introduce some challenges. The final selection is to use thickened tailings having a solids content of 55 to 60 per cent.

However, it is anticipated that tailings will to be used as underground paste backfill, for the purposes of ground support. Because the temperature underground is stable at minus-6 to minus-8 Celsius, these tailings would freeze shortly after placement, and would not require any further reclamation underground. If practicable, the use of paste backfill would reduce a commensurate quantity of tailings that would otherwise have to be managed and stored on the surface. The preferred option for tailings management will be presented in the draft Environmental Impact Statement.

2.10.4 Freshwater Intake at Meliadine Lake

The camp area will have a water-treatment plant for fresh water. A fresh-water intake will be built at Meliadine Lake and a heat-traced, insulated water line would run to the fresh-water supply tank in the mill complex. A pump will need to be located in water deeper than four metres, to allow year-round operation and avoid disturbing the lake bottom. All alternatives would employ measures to avoid the entrainment of fish in the intake or the impingement of fish on any screens. The options include a jetty, a floating barge, and an insulated pipe running from shore into deep water.

A jetty would require the use of waste rock to build a structure out into the lake to a point where the water depth exceeds five metres. A wet well would be installed near the end of the jetty and a pumphouse built over it. The pumphouse would be heated and insulated. The drawback of this option is that it would have an impact on fish habitat and would require approval under the Navigable Waters Protection Act.

A floating barge, similar to that at Meadowbank, is also being considered. One end of the barge would be near the shore and the other end would be anchored in deep water. A pump would be lowered from the barge into deep water.

[9] Paste tailings are defined as tailings that have been significantly dewatered to a point where they do not have a critical flow velocity when pumped, do not segregate as they deposit, and produce minimal (if any) bleed water when discharged from a pipe.

The third option would see a large insulated pipe installed from the shore to deep water. The pump would be lowered down this pipe into deep water. The pipe would be covered with rip-rap to protect it from ice movement.

A jetty was selected for freshwater intake at Meliadine Lake.

2.10.5 Spur Road Options

Spur roads from the F Zone and Discovery deposits were investigated as either winter roads only, or all-weather roads. The spur roads were to join the proposed all-weather road between Rankin Inlet and the mine site. The appropriate decision became quite obvious during the initial stages of the feasibility study as year-round operations are planned, thereby necessitating all-weather roads. A spur road will be built to the Discovery ore body, while a haul road will be built to the F Zone ore body.

2.10.6 Project Alternatives

The Meliadine Gold Project, as proposed, is a medium-term, medium-sized mining operation with an estimated life of 16 years for construction, operations and closing. To forgo the building of the mine would be to lose a minimum of 8,000 person-years of employment, and business and economic development in the Kivalliq region would suffer accordingly

2.10.7 Project Schedule Alternatives

Scheduling any project in the Arctic is tightly constrained by shipping seasons and by weather windows for certain types of outdoor work. The project schedule therefore offers few possibilities for alternatives. If slippage occurs at any point in the schedule, there will be potentially lengthy and disproportionate delays in planned activities.

2.11 Project Operations

The Meliadine Gold Project will include both open-pit and underground development and mining. The combination of the two types of mining is necessary to obtain the best possible economic return for the project. The open pits will be located at the Tiriganiaq, F Zone, Wesmeg, Pump, Wolf and Discovery deposits. Underground mining will initially take place at the Tiriganiaq deposit, with the possibility that it could also occur at Wesmeg and F Zone deposits, subject to further exploratory drilling and the results of the feasibility study. In fact, underground mining cannot be discounted at any of the deposits as they remain relatively unexplored at depth.

The expected tonnes of overburden, waste rock, and ore for the various areas to be mined over the 10 year mine life are provided in Table 2-5.

Table 2-5 Overburden, Waste Rock and Ore Produced over the Mine Life (million tonnes)

Ore processing rate	8,500 tonnes per day
Mine Life	10 years
Ore processed	39.3
Ore from open pits	28.3
Ore from Underground	11.0
Open pit strip ratio	14
Total Waste from open pits	400
Total Waste from Underground	None, the underground will consume waste rock

2.11.1 Mine Production Schedule

The ore from the open pits will be trucked to the crusher stockpile; underground ore will be fed by conveyor. The economical cut-off grade will be based on the price of gold and operational parameters. Mineralized material below the cut-off grade will be stockpiled for possible processing in the later years of operation.

The mining sequence for open-pit and underground mining is presented in Table 2-6. Predevelopment of the underground workings and the stripping of overburden and waste rock at the Tiriganiaq deposit will commence prior to the plant production. The mine is expected to have a production life of 10 years.

2.11.2 Underground Mining

The underground mining of the Tiriganiaq deposit will be the most important component of the proposed Meliadine Gold Project. Deposits of this geological type commonly extend to depths of between 1,500 and 3,000 metres in mines around the world, and current information seems to point to the open-ended potential of this deposit. It is expected that additional underground exploration work will be conducted as the production and extraction of existing mineral reserves take place. Due to the different widths and characteristics of the various gold-mineralized surfaces in the underground mine, two different underground mining methods are envisaged:

- Mechanized cut-and-fill mining for narrower, more complex zones; and
- Longhole/blasthole mining for larger, thick ore horizons.

Work on the details of the underground program is continuing, and refinements to the mine layouts and schedules are expected as part of the feasibility study.

Access to the underground mine will be by way of a portal located close to the mill as shown on Figure 2-6. Although the existing portal will be abandoned, as it is within the footprint of the

Table 2-6 Production Schedule for the Open Pits and the Underground (kilotonnes)

Tiriganiaq	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
Waste Rock	12,456	37,380	37,414	8,978	16,331	12,581	8,994	5,957	2,856	801	2,282	7,307	4,669	-	158,006
Overburden	16,963	405	-	-	-	-	-	-	-	-	708	2,127	-	-	20,203
Ore	661	2,245	2,588	746	2,029	1,923	1,685	1,326	1,063	572	133	79	316	-	15,368
F-Zone - Total															
Waste Rock	-	-	-	17,691	8,382	913	-	-	-	-	-	-	-	-	26,986
Overburden	-	-	-	7,287	-	-	-	-	-	-	-	-	-	-	7,287
Ore	-	-	-	1,367	577	181	-	-	-	-	-	-	-	-	2,125
Pump - Total															
Waste Rock	-	-	-	-	-	-	10,178	3,586	-	28	13,563	2,268	-	-	29,624
Overburden	-	-	-	-	-	-	5,785	-	-	3,068	635	-	-	-	9,488
Ore	-	-	-	-	-	-	454	306	-	-	656	278	-	-	1,695
Discovery - Total															
Waste Rock	-	-	-	-	-	-	1,686	20,244	29,681	31,070	8,824	144	-	-	91,649
Overburden	-	-	-	-	-	-	3,666	3,625	-	-	-	-	-	-	7,291
Ore	-	-	-	-	-	-	47	375	649	1,206	868	31	-	-	3,176
Wesmeg - Total															
Waste Rock	-	-	-	512	7,945	23,207	7,102	4,267	5,286	2,916	3,864	7,867	4,065	-	67,032
Overburden	-	-	-	3,423	4,413	55	-	-	-	-	-	3,993	831	-	12,714
Ore	-	-	-	28	394	1,185	477	317	475	342	772	269	325	-	4,585
Wolf - Total															
Waste Rock	-	-	-	-	-	-	-	-	-	-	3,545	13,734	10,269	-	27,548
Overburden	-	-	-	-	-	-		-	-	-	4,135	1,522	48	-	5,705
Ore	-	-	-	-	-		-	-	-	-	23	389	916	-	1,327
Total All Pits															
Waste Rock	12,456	37,380	37,414	27,182	32,658	36,701	27,960	34,055	37,822	34,816	32,077	31,319	19,004	-	400,844
Overburden	16,963	405	-	10,710	4,413	55	9,452	3,625	-	3,068	5,478	7,642	879	-	62,688
Ore	661	2,245	2,588	2,141	3,001	3,289	2,664	2,325	2,187	2,122	2,452	1,046	1,557	-	28,277
Total Underground															
Total Ore	25	322	741	913	913	913	913	913	912	912	912	912	913	737	10,951

open pit, the larger part of the existing ramp will continue to be used when mining commences. The portal and ramp were designed to production standards, at 5.2 metres high and 5.2 metres wide. Details will be provided in the draft Environmental Impact Statement.

In order to mine and extract sufficient tonnages for daily mill requirements, mining will take place on multiple levels, on multiple working faces. Scoop tram and truck operators will remove waste rock and ore, and transport the ore to the surface or a silo underground. The waste rock will be dumped in mined-out areas or—if in excess of the underground capacity at the time—will be hauled to the surface and placed in a waste-rock management area. The equipment used in the underground mining operation will be substantially the same as that used in the mine's development, and is listed in Table 2.3.

Paste backfill will be used in mined-out stopes and other mined areas. The paste will be generated from tailings and mixed with cement as part of the final process in the mill. Special attention will be paid to the ability to move the paste successfully in a zone of continuous permafrost.

Early underground mining will be in the zone of continuous permafrost, which extends to depths of approximately 350 to 450 metres below surface. Since mining will extend below the permafrost in later years, the hydraulic conductivity of the bedrock below the permafrost is being tested, and a hydrological model for the deep groundwater will be developed for the project. Details will arise from the feasibility study and be provided in the draft EIS.

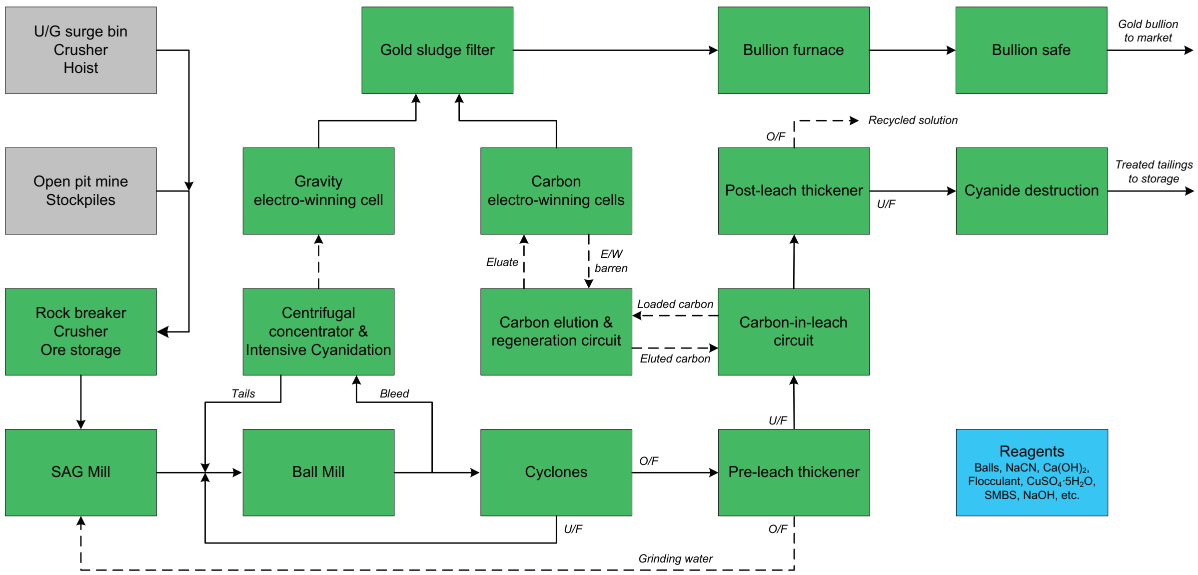
2.11.3 Open-Pit Mining

Conventional surface-mining methods will be used at all six deposit sites with the mining sequence shown above in Table 2-6. Frozen overburden, ore and waste rock will be excavated by drilling and blasting in benches. Backhoe and shovel-type excavators will load material onto trucks. These will haul the material to the crusher stockpile or waste-management area.

2.11.4 Ore Processing

The Meliadine Gold Project will use a conventional milling and gold-recovery process. The process involves a series of sequential steps consisting of crushing; grinding; gravity separation of free gold; cyanide leaching; and gold recovery. Since feed to the mill will be provided from several distinct ore bodies, it is likely that the metallurgical response could vary with the ore type. Variability testing of material from each deposit is therefore required to fully understand the implications for overall plant recovery; testing will be investigated as part of the feasibility study. A schematic outlining the preferred ore-milling and gold-extraction process is illustrated in Figure 2-9.

Figure 2-9 Preliminary Block Diagram of Gravity-Flotation-Cyanidation Flowsheet



Ore from the open pits and underground will be blended and fed to the crushing circuit. The mill rate will be determined by the feasibility study; the mill will process on average 8,500 tonnes per day.

The ore will be crushed in the primary crusher and fed by conveyor to the covered ore stockpile. It will be reclaimed from the stockpile and fed via conveyor belt to the grinding circuit, where it will first be reduced to a sand-sized consistency in a semi-autogenous grinding (SAG) mill. This will be followed by secondary grinding in a ball mill, which will reduce the rock to a fine slurry. The target grind size for cyanidation should be 80 per cent passing 105 µm, pending results of the feasibility study.

Tests of gravity-recovery methods indicate that gold is amenable to recovery in a centrifugal concentrator, and a gravity-recovery circuit is therefore included in the flowsheet. It is expected that about 30 per cent of the gold will be recovered in the gravity circuit; the precise proportion will be ascertained in the feasibility study. Gravity concentrate will be subjected to intensive cyanidation in a batch inline leach tank, followed by electrowinning to produce a gold sludge suitable for smelting.

The final product from the grinding circuit will go to a thickener to increase pulp density prior to cyanide leaching. The overflow water will be recycled back to the grinding thickener. Underflow from the thickener will go to two preaeration tanks in series, followed by cyanidation and carbon adsorption in a carbon-in-leach (CIL) circuit. The selection of a CIL circuit over a carbon-in-pulp (CIP) circuit was made due to the presence of carbon in the ore which, in previous test work, showed preg-robbing properties. The extent of preg-robbing and the final circuit configuration in terms of CIL versus CIP and the optimal number of stages will be ascertained by the feasibility study.

Loaded carbon will be stripped of gold in a pressure Zadra-type process, and the gold-bearing solution will be pumped through an electrowinning cell where gold will be recovered on steel-wool cathodes. Gold sludge from the cathodes will be collected, dried and smelted in a furnace to produce doré bars.

Cyanidation tailings will go to a thickener to recover cyanide solution, which will be recycled within the mill. Tailings containing residual cyanide will pass through cyanide destruction before being discharged to the tailings impoundment area. Cyanide destruction should employ the conventional SO_2/air process to oxidize and destroy it. The final reagent additions and circuit configuration for cyanide destruction will be determined by the feasibility study. It is currently assumed that the final tailings will be transported directly to the impoundment area, but the possibility of filtration or paste thickening is also being considered, with final selection pending the results of the feasibility study.

Services will be required for plant operations, which include reagent systems, water systems and air distribution systems. The expected reagent systems required are listed below in Table 2.6 and each will consist primarily of a mixing tank and holding tank. The steel balls will be added directly to the grinding circuit and the activated carbon directly to the carbon regeneration circuit, while the refinery reagents will be handled directly by the refiner. The final list of mill reagents and details of the circuit configuration will be determined by the feasibility study. The water systems required in the mill are detailed in section 2.13.1. Air compressors will be required to provide air for the cyanidation and cyanide-destruction circuits, as well as for crusher dust control and instrumentation air.

2.11.5 Gold Shipments

Following the smelting of the gold bars, they will be placed in a secure vault on site pending shipment to the Royal Canadian Mint. AEM security personnel will be responsible for the safe storage of gold on site and its transport via air to the Mint. Proprietary security provisions are being developed for the gold-handling process.

Table 2-7 Expected consumables required for the mill

Chemicals	Circuit	Expected Consumption (kg/t)
Steel balls	Grinding	1.5
Flocculant	Grinding	0.04
Lead Nitrate	Carbon-in-Leach	0.35
Cyanide	Carbon-in-Leach	0.6
Lime	Carbon-in-Leach	2.5
Activated Carbon	Carbon-in-Leach	0.03
Sodium hydroxide	Elution-Regeneration	0.25
Chlorhydric acid	Elution-Regeneration	0.7
Antiscalant	Plant general	0.035
Borax	Refinery	0.005
Sodium nitrate	Refinery	0.005
Silica	Refinery	0.005
Sodium metabisulfite	Cyanide destruction	2
Copper sulphate	Cyanide destruction	0.075

The above materials will be transported to the site by surface means in accordance with the applicable Transport Canada regulations. A staging point will be maintained at Rankin Inlet. Materials will be unloaded, moved and loaded by forklift. Employees engaged in handling these materials will be fully instructed in WHMIS and safe handling procedures. At the mine site, these materials will be stored within the mill complex and/or in the mill warehouse. These materials will be kept in their original containers until actual use.

2.12 Tailings, Ore Stockpiles and Waste Rock/Overburden Management

Final quantities of tailings, stockpiles and waste rock/overburden are provided in Table 2.5 for all six deposits over a 10-year mine life

On average, 8,500 tonnes of tailings will be produced daily, with a solids composition of 55 to 60 per cent (see Section 2.10.3 for more details). The tailings will be piped to the tailings impoundment area through an insulated, heat traced pipeline with water reclaimed from the impoundment to the mill through a similar parallel pipeline. A portion of the tailings could also be used as underground paste backfill for ground support.

Ore will largely be delivered directly to the crusher stockpile in order to avoid the duplicate handling of material. Ore from the underground will be crushed before it is placed on the conveyor, which will deliver it directly to the dome. Crushed ore will be stockpiled under a dome to minimize dust emission. A run-of-mine (ROM) stockpile will be located near the mill to be used if necessary. Low-grade stockpiles are planned near the crusher and will receive ore from all deposits.

Waste rock will be used for site construction as much as possible, with the excess going to the waste-rock management areas. Analyses of the waste rock for acid generation potential has been largely completed for Tiriganiaq, F zone and Discovery, while the same testing for Pump, Wolf and Wesmeg is well underway. The results of the testing will be presented in the draft EIS.

Overburden will be stripped from the open pits early in the development of each deposit and will be used for construction wherever possible. Studies of the Tiriganiaq till overlying the proposed open pit are under way to determine how much can be used for construction. Most samples of waste rock and all samples of surface soil indicate that there is no potential to generate acid rock drainage (ARD). This finding generally stems from the rock's low sulphide content and its excess buffering capacity, because of the presence of reactive carbonate minerals. However, on occasion, the till material has been found to leach some trace metals in concentrations that exceed the Canadian Water Quality Guidelines for the protection of freshwater aquatic life.

Tests are under way to further evaluate the potential of this waste rock and till material for ARD and metal leaching. The results will be included in the draft EIS. Any materials shown to have excessive metal leaching would be placed in the waste-rock management areas.

2.13 Site Water Management

2.13.1 Fresh Water Use

A fresh-water intake will be placed in Meliadine Lake where the water depth exceeds four metres. It would be designed and built to avoid any entrainment or impingement of fish, to minimize the impact on fish habitat, and so that it would be granted approval under the Navigable Waters Protection Act.

Water will be used for domestic purposes, mining and mineral-processing. Fresh water will be pumped from Meliadine Lake to a fresh/fire water tank in the mill area. From there it will be distributed through a pressurized system to the potable-water treatment plant and to the mill. A separate firefighting main will also be kept under pressure.

Conventional treatment using sand filters, ultraviolet disinfection and/or chlorination are expected to be used for potable water. Potable water will be distributed throughout the camp, where it will be used for domestic activities, and the process plant. In the mill complex, it will be used in the change rooms and washrooms. Most of the water used in the mill process will be wastewater that is continuously reclaimed and will be complemented with fresh water only as required. The treatment of fresh water is not necessary for the mill process; in the mill, water will be reclaimed by dewatering the tailings or reclaiming wastewater from the tailings impoundment area. Arctic conditions suggest that it is desirable to retain the maximum amount of water possible in the mill complex.

Dedicated and pressurized water lines for firefighting will run from the fresh-water tank to distribution points in the mill and the accommodation complex. Water for firefighting will take priority over all other uses; the lines delivering it will be greater in diameter than the potable-water lines, and will be at a higher pressure. Sprinklers will be located in accordance with building codes.

Water use will be approximately 5000 m^3/day.

2.13.2 Water Management

Water management at the Meliadine Gold Project will ensure that any water directly affected by mine operations is controlled, tested and released to the receiving environment only after meeting licence/Metal Mining Effluent Regulation limits. The exact locations of water-collection sumps at the Tiriganiaq, F Zone, Pump, Wolf, Wesmeg and Discovery mining areas will be detailed in the draft Environmental Impact Statement. The sumps will be sized to hold water running off the waste rock/overburden management areas and the low-grade ore stockpiles, as well as any water pumped from the open pits. Water samples will be collected from the sumps and if licence/MMER conditions are met, the water will be released to the environment. If not, the water will be treated and held until it meets licence/MMER limits.

The tailings pond could be used as a water-management pond, or another area could be selected to manage surface waters. This water would be tested and if necessary, treated, before release to the environment. It would be released downstream of Lake B7 and pass through a series of small lakes that would serve to polish the effluent before it reaches Meliadine Lake to the southwest.

Underground mining will eventually extend below the permafrost. Studies have been initiated to estimate the potential quantity and quality of water that may be encountered below the permafrost and how it will be handled.

Wastewater from the accommodations complex will be treated in a sewage treatment plant. The design of the treatment system will be based on a flow rate of 200 litres per day, per worker. A number of site-specific parameters must be accounted for in the design of a sewage treatment facility. These include the proximity of the system to wastewater inputs, the anticipated influent characteristics (i.e., the quality and quantity of the wastewater), the estimated site conditions (i.e., the number of workers), the effluent requirements, and the maximum and minimum ambient temperatures. The sewage treatment plant for the camp will be designed to meet the Nunavut effluent guidelines for wastewater discharge and/or Nunavut Water Board licence requirements. It will be housed in a prefabricated, modular structure adjacent to the camp with the treated water pumped to a holding pond near the plant. The pond will have a dike to control flow to the receiving environment.

2.14 Waste Management

Site operations will use all available opportunities to reduce, reuse and recycle waste materials. Where this is not possible, waste materials will be disposed of in accordance with best practices and applicable regulations. Inert, non-recyclable, non-combustible solid waste will be disposed in an on-site landfill, which will be located in a waste rock management area.

The mine site will include a dedicated waste-management building in accordance with current practice at other northern mines. This building will be separate from the accommodation and mill complexes and will be used for waste processing. The building will house a high-efficiency, dual-chamber, controlled-air industrial incinerator for all combustible, non-hazardous wastes. The unit will be diesel-fired and its exhaust will be located downwind of the facilities. Other equipment in the waste-management building will include a barrel crusher, a plastic shredder, drip trays for oil filters and paint cans, and a means of packaging hazardous wastes. Hazardous wastes will be packaged for shipment off-site to registered hazardous management facilities in southern Canada. Wastes that can be handled locally or on-site will be managed daily. The accumulation of wastes will be avoided through an active waste-management program.

Acceptable waste for incineration will be:

- Solid waste (mainly organic matter, including food, food containers and wrappings contaminated by food);
- Sewage sludge (mainly generated during the construction phase; during the mine's operation, sludge may be disposed of in a different manner);
- Used oils, including flammable or combustible petroleum hydrocarbons, and plastic products.

The waste-management building will be managed and operated by workers after proper training. They will be issued appropriate personal protective equipment, including the means for decontamination, as applicable.

A Waste Management Plan will be developed that will detail how non-hazardous and hazardous waste will be identified, handled and properly disposed of at or from the mine site. This plan will build on the existing plan under water licence 2BB-MEL0914 and will be included in the draft Environmental Impact Statement.

2.15 Bulk Materials, Fuel and Explosives Management

2.15.1 Bulk Materials

The Meliadine project will order a year's supply of bulk materials from suppliers each spring. Total tonnage may be between 100,000 and 200,000 tonnes per year, including fuel.

Bulk materials, other than diesel fuel, will typically include mill reagents, grinding balls, drill steel, rock-support materials, fabrication steel, explosives, lubricants, tires and non-perishable foods. Upon arrival in Rankin Inlet, these materials will be staged through the laydown area and secure storage area before being trucked to the mine site.

2.15.2 Fuel

Current estimates suggest the proposed Meliadine mine would need fuel storage capacity in Rankin Inlet for up to 80 million litres. Fuel will be shipped to Rankin Inlet in vessels, transferred to the tank farm via a floating pipeline, and trucked to the mine site year-round.

2.15.3 Explosives

The mine’s annual consumption of explosives is estimated to be between 7,000 and 14,000 tonnes, two-thirds of which will be Ammonium Nitrate - Fuel Oil (ANFO). This will be shipped as bulk ammonium nitrate prill. Bulk ammonium nitrate is inert and will not require special handling or storage during transit.

Ammonium nitrate will remain in its shipping containers until needed. A building will be constructed on the site in which to manufacture explosives. The potential location is shown in Figure 2-6. The buildings would be built to the specifications dictated by applicable laws and regulations.

The balance of the explosives and blasting accessories will be stored in a secure magazine(s). These items will be cartridged slurries (Hazard Classes 1.1D and 1.5D), detonating cord and detonators. All handling, transport, storage, manufacture and use of explosives will be subject to federal approval under the Explosives Act, and the Nunavut Mine Health and Safety Act.

2.16 Safety

AEM recognizes that the Meliadine project involves activities that may pose hazards, and the company places the utmost priority on safety. If local services are used at the mine, their safety requirements will match those of the mine. All individuals will be trained to ensure that they:

- Understand their job responsibilities;
- Understand the hazards of their jobs and how to safeguard against them;
- Know how to use safety equipment;
- Know how to respond to emergency situations; and
- Wear appropriate personal protective equipment.[10]

Emergency supplies and equipment will be kept at the workplace and select members of each work crew will be trained in first aid.

The contractor for the underground exploration program developed a Mine Rescue Plan. Comaplex purchased the mine rescue equipment from the underground contractor in the fall of 2008. This

[10] Personal protective equipment includes, but is not limited to: safety glasses; safety vest or reflective clothing; hard hat; safety boots and heavy-duty work gloves. Specific tasks may require additional, special-purpose equipment, such as face masks or safety lanyards and harnesses.

equipment is still on the site. A comprehensive mine rescue plan was developed and submitted to the government of Nunavut to comply with its mine safety legislation and regulations before the start of the underground exploration and bulk-sampling program in 2011. The rescue plan will be updated before underground mining commences, once regulatory permits are in place.

Gates will be placed on the all-weather road just outside the mine area and also on the spur road near the Discovery gold deposit. Public access to the mine and related facilities will be restricted to authorized personnel. Unauthorized visitors will be escorted off the site. When members of the public are authorized by the company to visit the site, they will be given a safety orientation and personal protective equipment. During their visit, they will be accompanied by site personnel at all times. Signs at the entrance restricting access to the site will be posted in English and Inuktitut. Signs will indicate parking and reception areas for visitors. Safety policies and procedures will be further developed in the draft Environmental Impact Statement.

2.17 Project Closure and Reclamation

2.17.1 General Approach

The Meliadine Gold Project's reclamation objectives are to minimize negative environmental effects of mining wherever practicable, to practice progressive reclamation, and when mining operations are closed, to return areas that have been negatively affected to productive and lasting use by wildlife and humans. Reclaimed areas will be chemically and physically stable, and should ultimately support the same functions as the surrounding, undisturbed land. Because of the proximity of the mine site to Rankin Inlet, particular attention will be paid to ensuring that reclaimed areas are safe for future traditional use.

A practical, cost-effective approach will be central to the reclamation and closing of the project's properties. AEM's intent is to keep climate change in mind, and to leave the reclaimed properties in such a way that no long-term care and maintenance will be required. A Reclamation and Closure Plan will be developed and then updated and revised on a regular basis; ultimately, it will evolve into an interim plan during the active mining phase, becoming a final plan when the mine closes. Each iteration of the plan will provide more detail and greater certainty regarding the sequence of events involved in reclamation and closure. The Reclamation and Closure Plan will also address temporary shutdowns, times when the mine is placed in care and maintenance. This plan will be presented in its initial form in the draft Environmental Impact Statement.

Progressive reclamation efforts will be used throughout the life of the mine to reclaim areas that are no longer needed for mining. In general, disturbed land surfaces will be stabilized, thereby promoting natural revegetation. This work will be undertaken in accordance with best practices in the reclamation field, and will ultimately advance the return of former mining areas to natural conditions, while reducing the overall cost of reclamation. In a similar manner, buildings, obsolete equipment and surplus chemicals will be removed as soon as they are no longer needed.

Hazardous waste and contaminated soil will be managed continually; consequently there will be little to no accumulation of such wastes during the operation of the mine, subject to seasonal shipping considerations.

A site-monitoring program will continue after the mine is closed, but the emphasis will shift from mining operations to the success of reclamation activities and the recovery of affected areas.

2.17.2 Reclamation of Quarries, Roads and Waste Rock/Overburden

A geochemical study of the waste rock/overburden from the Tiriganiaq, F Zone and Discovery pit areas by the company's independent consultant, Golder Associates, indicates that there is little to no likelihood of acid rock drainage. Waste rock and overburden from the Pump, Wesmeg and Wolf deposits are now being tested to determine their potential to leach trace metals over time. Studies at diamond mines in the Northwest Territories indicate that waste-rock management sites remains frozen after the rock is placed there; because these sites are elevated above the surrounding terrain, they become super-cooled to temperatures well below those prevailing in the near-surface permafrost. Precipitation and melting snow is captured in the waste-rock management areas with little leachate evidenced at the toes. As a result of this super-cooling and lack of runoff, there is only a shallow active layer of overburden during the summer, and the larger part of the waste rock/overburden remains physically and chemically stable.

Parts of the overburden that are not suitable for construction purposes would be included in waste-rock management areas. At the Tiriganiaq site, overburden consisting of glacial till cannot, in large part, be used for construction, while some of the overlying esker material can. Placing the waste rock with an eye on reclamation will ensure its stability, reduce its visibility and control runoff erosion. Sumps will be removed and dikes breeched to allow natural drainage. Diverted watercourses will be re-established, and culverts in roads to be reclaimed will be removed to allow the passage of fish.

Once mining is complete, the open pits will be allowed to fill with water. AEM is also investigating the possibility of backfilling mined-out open pits, partly or totally, with overburden and waste rock. If practical and if there is time, this approach could help to minimize the final footprint of the operation. Depending on the volume of a given pit, it will take some years to fill with water. Water quality will be monitored throughout this time, and when the pit is full, to ensure it meets standards for receiving water.

Preliminary plans suggest that the mine's landfill site will be placed in a waste-rock management area. Only non-hazardous, solid materials would be deposited there, and would be covered daily. Materials not suitable for the landfill would be handled in the waste-management building. No reclamation of the landfill will be required.

All roads will be reclaimed unless it is the express desire of the residents of Rankin Inlet that they be left in place to provide access to cabins and other traditional pursuits in and around Meliadine Lake. The spur roads to the satellite deposits would be reclaimed as required. The timing of road closures will be dependent on post closure monitoring for the site.

2.17.3 Reclamation of Tailings Impoundment Area

The tailings impoundment area will be in use until the end of mining production. Lake B7 basin is proposed to be used for tailings deposition and a portion of the lake will be dewatered prior to it being used for tailings deposition. Tailings would be deposited there throughout the life of the mine, and this tailings mass would ultimately freeze. During reclamation, the tailings will be covered by waste rock of sufficient thickness that the active layer will remain in this cover material, ensuring that the tailings mass beneath it remains permanently frozen.

The reclamation of the tailings facility will be timed to coincide with the final shutdown of the mill. As mining nears completion, the progressive reclamation of the tailings will be timed so that as much of the management area as possible will be covered by the time the last of the tailings are delivered to the site. Monitoring will also be undertaken to document the efficacy of the progressive reclamation.

The pipelines used to transport tailings to the Tailings Impoundment Area and return reclaimed water to the mill will be removed. The service road to the tailings area will remain, to allow water-quality monitoring as part of the Aquatic Environmental Effects Monitoring Program.

2.17.4 Reclamation of the Mine Site

The reclamation of the mine's infrastructure will proceed in stages, beginning shortly after production begins, with the removal of any unused infrastructure.

Upon the completion of milling and ore processing, the mill and all processing circuits will be dismantled and scrubbed to recover all remaining gold, which will be smelted as the final gold produced at the Meliadine mine. All wash-down water will be directed through the cyanide destruction plant before being discharged.

Site buildings will be cleaned, dismantled to the greatest extent possible, and—because of their proximity to Rankin Inlet—offered for sale to the community. The last building to be reclaimed will be the waste-management building. All foundations will be leveled and, along with concrete floors, will be covered with waste rock. A dedicated closure landfill will be established in a waste rock management area for non-hazardous demolition material.

Specialized mining and milling equipment with residual value will be sold and removed through Rankin Inlet by sealift. General equipment such as graders, dozers and loaders required for the reclamation work will be the last to go, and will be offered to the community for purchase or salvage. Maximum use will be made of the underground to dispose of all inert, non-salvageable equipment and materials. These will be cleaned of hazardous materials such as oil and grease before being moved underground for final disposal. All the openings to the underground will be permanently sealed and made inaccessible.

Any fuel remaining in the tank farm will be pumped out and moved to a fuel tank in Rankin Inlet. The tanks will be disassembled and moved to Rankin Inlet for re-assembly, or placed in the dedicated closure landfill, the underground or the open pits. If spilled fuel is present in the lined and bermed tank-farm area, it will be collected from the sumps and burned in the incinerator. Once the soil in the tank farm meets soil quality requirements, it will be reclaimed, and the berms will be leveled.

All chemicals, mill reagents, explosives and hazardous materials still in unopened packages when the mine closes will be shipped south for resale or reuse. Unpackaged or waste materials will be shipped for recycling or disposal in a licenced landfill. The operation of the waste-management building throughout the life of the mine, together with the annual removal of surplus chemicals and hazardous waste and the immediate cleanup of spilled fluids, will minimize the quantity of material requiring handling, packaging and removal when the mine closes.

Pilings that support the accommodation complex will be cut off at or below ground level. All pipelines will be removed, and service roads scarified with culverts removed and natural drainage re-established.

2.17.5 Off-Site Reclamation

In Rankin Inlet, the laydown area and fuel storage will be offered for sale to the town, local businesses or government agencies. If there are no interested parties, reclamation would be conducted as for the main site.

SECTION 3 EXISTING ENVIRONMENT AND BASELINE STUDIES

3.1 Overview of Project Environmental, Socio-economic, and Traditional Knowledge Studies

The Meliadine Gold Project will interact with the natural and human environment of the area in both time and space. The natural and human environment has been extensively studied since 1997 and an overview of this work is provided here. The years when studies were carried out are noted in Table 3-1. No substantial work was done on the property between 2002 and 2004. In 2011, a gap analysis led to a large program being mounted to collect additional information necessary for the draft Environmental Impact Statement.

Table 3-1 Environmental, Socio-economic and Traditional Knowledge Studies

Baseline Studies	1997	1998	1999	2000	2001	2005	2008	2009	2010	2011
Aquatic Invertebrates & Algae	√	√								√
Water Quality	√	√	√	√			√	√		√
Sediment Quality		√		√						√
Hydrology[1]	√	√	√	√			√	√		√
Geochemistry - Acid Base[2]		√			√	√	√	√	√	√
Fisheries	√	√	√	√	√		√	√		√
Wildlife	√	√	√	√			√	√		√
Vegetation & Soil		√					√	√		
Climate[3]	√	√	√	√	√	√	√	√		√
Traditional Knowledge	√		√						√	√
Heritage Resources		√					√		√	√
Socio-economic	√		√						√	√
Public Consultation	√	√	√	√			√	√	√	√

[1] Regional hydrology studies by Water Survey of Canada carried out from 1989-1995
[2] Geochemistry studies in 1998, 2001 and 2005 were not as extensive as studies in 2008 and 2009
[3] Regional climate studies by Environment Canada from 1981 to the present

With reference to Table 3-1, it should be noted that baseline data for air quality and noise were not collected. Before exploration, the area was subject to air emissions only from Rankin Inlet and the global atmosphere. The baseline for air quality and noise will therefore reflect scientific data collected elsewhere under similar conditions. For the baseline indicators for which data were collected, an overview of the natural and human environment follows. Greater detail and a synthesis of all the data collected over the years will be presented in the draft Environmental Impact Statement, as will the identification of valued environmental and socio-economic components. These valued components will be selected through a review of baseline studies; scoping by the Nunavut Impact Review Board; continuing consultation; input from various agencies and the work of focus groups.

The information collected to date about the environment, socio-economic picture and traditional knowledge in the area of the Meliadine project will be used in preparing the draft Environmental Impact Statement. However, further baseline studies are planned to gather more socio-economic information and Inuit Qaujimajatuqangit beforehand. Following the environmental assessment and regulatory permitting processes, it is expected that monitoring will measure and interpret changes to the valued environmental and socio-economic components identified with the project, and report those changes on a regular basis. Additionally, compliance monitoring will be undertaken to ensure that all regulatory limits are met and commitments made are fulfilled.

3.2 Physical Environment

3.2.1 Geology and Mineralization

Six mineral deposits have been defined at the Meliadine property. The Tiriganiaq, F Zone, Wesmeg, Wolf, Pump and Discovery deposits are considered for mining. Detailed surface mapping of the deposits is not possible due to the complete or almost-complete lack of outcrop in the immediate vicinity of the deposits. The geology of the deposits has therefore been interpreted from a combination of drilling information, high-density ground magnetic surveys, and outcrop mapping and channel sampling.

Geologically, the facing-direction evidence suggests that rock layers have been overturned at each deposit, with the older rocks to the north lying structurally on top of the younger ones to the south.

Gabbro dikes and sills of several ages are recognized on the property. The oldest gabbro bodies are contained within the Wesmeg Formation and are interpreted as feeders to the overlying basalt pile. The youngest gabbros commonly cross-cut the second-generation folds in the Sam Formation, and postdate the deformation associated with the gold deposits.

Minor narrow, undeformed lamprophyre dikes are intersected locally and cross-cut all older rock units, including mineralized veins.

All the rocks in the deposit areas are lower to middle greenschist metamorphic grade.

The main targets of exploration at the Meliadine project are mesothermal lode gold and shear-controlled deposits. The six gold deposits defined on the property are vein- and shear-dominated occurrences; these are hosted predominantly in iron formations, fine-grained sediments, and volcanics, either on an east-west-trending splay off the 115 degree trending regional Pyke Fault (such as at the Tiriganiaq deposit), or on structures parallel to the Pyke Fault (such as at the Discovery, Pump, F Zone, Wesmeg and Wolf deposits).

Gold mineralization in these deposits is strongly correlated with shearing and quartz veining. Mineralized lodes are hosted in quartz-vein stockworks, laminated veins and variably sulphidized iron formation; they are in complexly folded and sheared iron formation, sedimentary and volcanic rocks in or near the volcanic-sedimentary contact.

3.2.1.1 Tiriganiaq

The stratigraphic sequence in the Tiriganiaq deposit area strikes east-west and dips to the north at an average of 60 degrees. The orientation of the Tiriganiaq gold deposit is unique on the property; the rock units are aligned for more than three kilometres along what is interpreted as the mineralized shear direction.

Clastic turbidites of the Sam Formation are the oldest (northernmost) rocks. Beneath is the Upper Oxide Formation, a diverse package of iron-rich rocks that includes beds of magnetite, chert, chloritic mudstone, and greywacke. The upper contact with the Sam Formation is occupied by the distinct, laterally consistent “Upper Oxide Iron Formation,” which is easily recognized and traceable across the property due to its high magnetic susceptibility. Further south is the Tiriganiaq Formation of laminated siltstones.

At the base of the Tiriganiaq Formation there is sporadic black argillite, commonly underlying 1000-lode mineralization. The Lower Fault likely formed along this obvious stratigraphic weakness. This fault defines the contact between the Tiriganiaq Formation and the underlying Wesmeg Formation of chlorite-rich massive to pillowed basalts with rare gabbro dikes and interflow sediments. The Lower Fault is the locus of intense late shearing that decreases away from the contact surface, but is more developed in the structural hanging wall. Splay faults emanating from the Lower Fault have resulted in repetition of the stratigraphy in the Tiriganiaq gold deposit.

Mineralization in the Tiriganiaq gold deposit is strongly associated with shearing and quartz veining, which likely developed during the Proterozoic third deformation event. The most intense and consistent gold mineralization is present within both the Upper Oxide Iron Formation and proximal to the Lower Fault in the siltstones of the Tiriganiaq Formation, but minor amounts of mineralization have been reported in all rock types. Areas of intense shearing are ”healed” by quartz veining and there is generally little to no brittle deformation.

Visible gold is common in all lodes in the deposit and is present in quartz veins, pyrrhotite, and along the margins and late fractures of arsenopyrite crystals.

3.2.1.2 F Zone

The stratigraphic sequence in the F zone deposit area strikes northwest-southeast and dips from 45 to 50 degrees to the north.

The host rocks for F zone are chlorite-rich massive to pillowed basalts of the Wesmeg Formation, which are cut by rare gabbro dikes and interflow sediments. Within the Wesmeg Formation are chert-rich and iron-poor rocks of the Lower Lean Iron Formation that consist of metre-scale cherty iron formation units interbedded with centimetre-scale volcanic units. The iron formations that host the gold mineralization vary in thickness from metres to tens of metres. This great thickness is interpreted to be the result of the intersection of an east-southeast-trending iron formation with a dominant east-west-trending structure and a second southeast-trending structure. Plunges of these thick mineralized iron formations vary from steeply northeast to steeply northwest.

Mineralization in the F Zone deposit is strongly associated with shearing and quartz veining within the Lower Lean Iron Formation. Thicker sections with higher gold grades are controlled by the intersection of the east-southeast-trending iron formation with a dominant east-west-oriented structure and a second southeast-trending structure. Plunges of this thickening vary from steeply northeast to steeply northwest, depending on local changes in strike.

Free gold occurs as discrete blebs in pyrrhotite and quartz shears and to a lesser extent along fractures and grain boundaries in large recrystallized arsenopyrite.

3.2.1.3 Discovery

The stratigraphic sequence in the Discovery deposit area strikes northwest-southeast and dips from 45 to 60 degrees to the north.

Clastic turbidites of the Sam Formation are the oldest (northernmost) rocks. As at Tiriganiaq, these overlie the Upper Oxide Formation and its uppermost portion, the “Upper Oxide Iron Formation.” Chlorite-rich massive to pillowed basalts of the Wesmeg Formation form the structural footwall to the sequence, but occur at least 600 metres south of the Discovery deposit. The Lower Fault forms the contact between the Wesmeg and Upper Oxide formations and is interpreted as a basal detachment surface, but in the area of the Discovery deposit it is not exposed and has not been drilled so far. The Lower Fault therefore represents a potential target for Tiriganiaq-style-lode gold-vein zones similar to the 1000-lode.

The Upper Oxide Iron Formation hosts most of the gold mineralization at Discovery. It is strongly folded with most of the thicker and more continuous mineralization following the fold noses, which plunge to the east-northeast at 47 degrees.

Mineralization in the Discovery gold deposit is strongly associated with shearing and quartz veining within the Upper Oxide Iron Formation. The thicker, higher-gold-grade sections are controlled by the noses of Z-shaped folds that trend east-northeast and plunge 47 degrees. In the area of the current mineral resource estimate, at least four of these fold noses have been identified: Pisces, Discovery, Discovery West, and Capricorn.

Free gold occurs as coatings and fracture fillings in large recrystallized arsenopyrite and pyrrhotite grains, and as disseminations in quartz veins and chlorite layers. Trace amounts of sphalerite and chalcopyrite are found locally.

3.2.1.4 Wolf

The stratigraphic sequence in the Wolf deposit area strikes northwest-southeast and dips 70 degrees to the north. The Wolf gold deposit is divided into two areas: the northerly Wolf North is hosted in stratigraphy similar to Tiriganiaq, while the southerly Wolf Main is hosted in stratigraphy similar to F Zone.

Clastic turbidites of the Sam Formation are the oldest (northernmost) rocks. These overlie the Upper Oxide Formation and its uppermost portion, the “Upper Oxide Iron Formation,” which hosts the Wolf North mineralized zones.

Chlorite-rich massive to pillowed basalts of the Wesmeg Formation form the structural footwall to the sequence. Within the Wesmeg Formation are chert-magnetite-chlorite iron formations of the Lower Lean Iron Formation that host the Wolf Main mineralization.

East-west structures intersecting the dominant east-southeast stratigraphic trend may control the gold mineralization at Wolf North and Wolf Main.

Mineralization at the Wolf gold deposit is divided into Wolf North (resembling Tiriganiaq), Wolf Main (similar to Pump and F zone), and Wolf Central. The mineralization is strongly associated with shearing and quartz veining within the Upper Oxide Iron Formation and thus is analogous with the 1100-lode at Tiriganiaq in setting and character. Gold mineralization occurs as disseminated and coarse blebs of gold within sheared silica-replaced iron formation and within coarse arsenopyrite and pyrrhotite concentrations in veins. The other form of mineralization is associated with lode quartz on or near the Lower Fault, which represents the contact between the structurally overlying Upper Oxide Formation and the Wesmeg Formation and is analogous with the 1000-lode at Tiriganiaq. Gold mineralization appears as free gold in laminated and non-laminated quartz veins with lesser concentrations of arsenopyrite and pyrrhotite.

In Wolf Main, as at Pump and F Zone, mineralization is found along the Lower Lean Iron Formation.

3.2.1.5 Pump

The stratigraphic sequence in the Pump deposit area strikes northwest-southeast and dips 50 degrees to the north.

As at F Zone, the host rocks for the Pump deposit are chlorite-rich massive to pillowed basalts of the Wesmeg Formation, which are cut by rare gabbro dikes and interflow sediments. At Pump, there are three types of chert-rich iron formations in the Lower Lean Iron Formation: chert-magnetite-chlorite iron formation, grunerite-cummingtonite-rich iron formation, and sulphide-rich beds in chert-dominated iron formation. Occasional metre-scale ultramafic units are noted in the sequence.

The main structural feature is a kilometre-long Z-shaped fold formed by the intersection of east-west-oriented shear structures and the Lower Lean Iron Formation.

Mineralization in the Pump gold deposit is also strongly associated with shearing and quartz veining within the Lower Lean Iron Formation, with thicker, higher-gold-grade sections associated with east-west shearing. As at the F Zone deposit, the plunges of this thickening vary from steeply northeast to steeply northwest depending on local changes in strike.

Free gold occurs as discrete blebs in pyrrhotite and quartz shears and to a lesser extent along fractures and grain boundaries in large recrystallized arsenopyrite.

3.2.1.6 Wesmeg

The Wesmeg deposit was the target of a dedicated drilling program for the first time in 2010. There appear to be two parts to the deposit: a northern and southern part.

In the northern part, Wesmeg's stratigraphic sequence strikes east-west and dips 65 degrees to the north. This is similar to the east-west orientation of the Tiriganiaq gold deposit (about 400 metres to the north of Wesmeg), where it is interpreted as the mineralized shear direction. This same orientation is observed in the results of a high-resolution magnetic survey over the northern part of the Wesmeg area.

The stratigraphic sequence in the southern part of the Wesmeg area strikes northwest-southeast and dips 50 degrees to the north.

The host Wesmeg Formation is chlorite-rich massive to pillowed basalts and interlayered mafic volcaniclastics are rare gabbro dikes, with some interflow sediments comprising siltstone, mudstone (some graphitic) and minor iron formations. The chert-rich and iron-poor rocks of the Lower Lean Iron Formation consist of interbedded metre-scale cherty iron formation units interbedded with centimetre-scale volcanic and sedimentary units. The iron formation units hosting the gold mineralization at Wesmeg vary in thickness from metres to tens of metres.

Mineralization in Wesmeg is strongly associated with shearing and quartz veining within the Lower Lean Iron Formation, with thicker, higher-gold-grade sections.

Free gold occurs as discrete to coarse blebs, locally disseminated, associated with very coarse to finely disseminated arsenopyrite.

3.2.2 Permafrost

Permafrost underlies all the land and most of the shallow lakes in the mine area. Alterations to the permafrost and the active layer of land will occur with the creation of quarries for granular material and rock, the building of roads, dikes and pads, the storage of waste rock and overburden, and possibly also from any ground disturbance.

Granular-material quarries are normally located in tills and glacial deposits. The removal of granular material causes a shift in the active layer of ground, and can result in the melting of ground ice and the resulting thaw settlement (when thawed areas of ground move or settle). This can result in erosion, the slumping of side slopes in the summer, and an altered landscape that extends beyond the quarry. Rock quarries can also change the active layer, but without the same consequences that are possible from granular-material quarries.

The construction of roads, dikes and pads can result in permafrost moving up into the new structure. This has the positive effect of increasing its stability. In the case of dikes, permafrost has the desirable effect of reducing their permeability. However, as permafrost moves up into the bases of pads and roads, it forms a dam and can result in water ponding against the structure, as well as subsequent changes in vegetation. The same also applies for waste rock and overburden storage areas, where water can also pond. The active layer of ground (that which goes through an annual freeze/thaw cycle) is between one and two metres thick in the project area, depending on the type of ground cover. It is believed that a "through talik" (a type of year-round unfrozen ground) underlies Meliadine Lake and possibly some of the medium-sized lakes, such as B6, B7 and A8. However, all the small lakes and ponds directly overlying or immediately proximal to most gold deposits freeze to the bottom and will not have a through talik.

A sealed sensor cable, for determining the annual soil temperature profile from the surface through the permafrost zone, was placed in drill hole Mel 98-195 in June 1998. This drill hole is close to Lake A54. Permafrost in the area extends to a depth of 450 metres from the surface with minimum temperatures of minus-6 to minus-8 Celsius at approximately 10 metres depth. Permafrost deeper than 10 metres from the surface did not show seasonal temperature variation. Additional thermistors were installed in 2007, 2008, and 2009 at the locations of the proposed tailings dikes, waste-rock management areas, and mill/camp site. Two more thermistors are to be installed in 2011 to monitor the temperature gradient through the bottom of the permafrost transition zone to a depth of approximately 550 metres.

Diamond drilling on the Meliadine property over the years has confirmed that permafrost in the area extends to between 350 and 450 metres vertically below the surface. Drill holes passing through the base of the permafrost have noted on occasion a minor amount of free water entering the drill stem in the permafrost transitional zone.

In the summer of 2009, Golder Associates tested the hydraulic conductivity of the bedrock under the base of the permafrost in Lake B7. A water sample was also obtained for testing, from a depth of 200 metres within the talik and showed a composition of diluted seawater. In September 2011, more testing of the hydraulic conductivity, quantity and quality of the groundwater was undertaken. Test results will be provided in the draft Environmental Impact Statement.

3.2.3 Air Quality and Noise

After the mine is constructed, the noise and air quality at the Meliadine project will be studied as part of a comprehensive monitoring program. Baseline air-quality data will be obtained from existing databases for areas not directly affected by current industrial or community influences in the Arctic. This baseline will serve for comparisons with data collected on-site after the commissioning of the mine.

3.2.4 Climate

The climate of the project area is characterized by short, cool summers and long, cold winters. Brisk wind is common year-round. Precipitation is roughly divided evenly between rain during the short summer and fall (predominantly in late summer), and snow, which can fall in any month, but is most common between October and April. Surface waters are usually frozen by early October and remain that way until early June. The land is usually snow-free by late June.

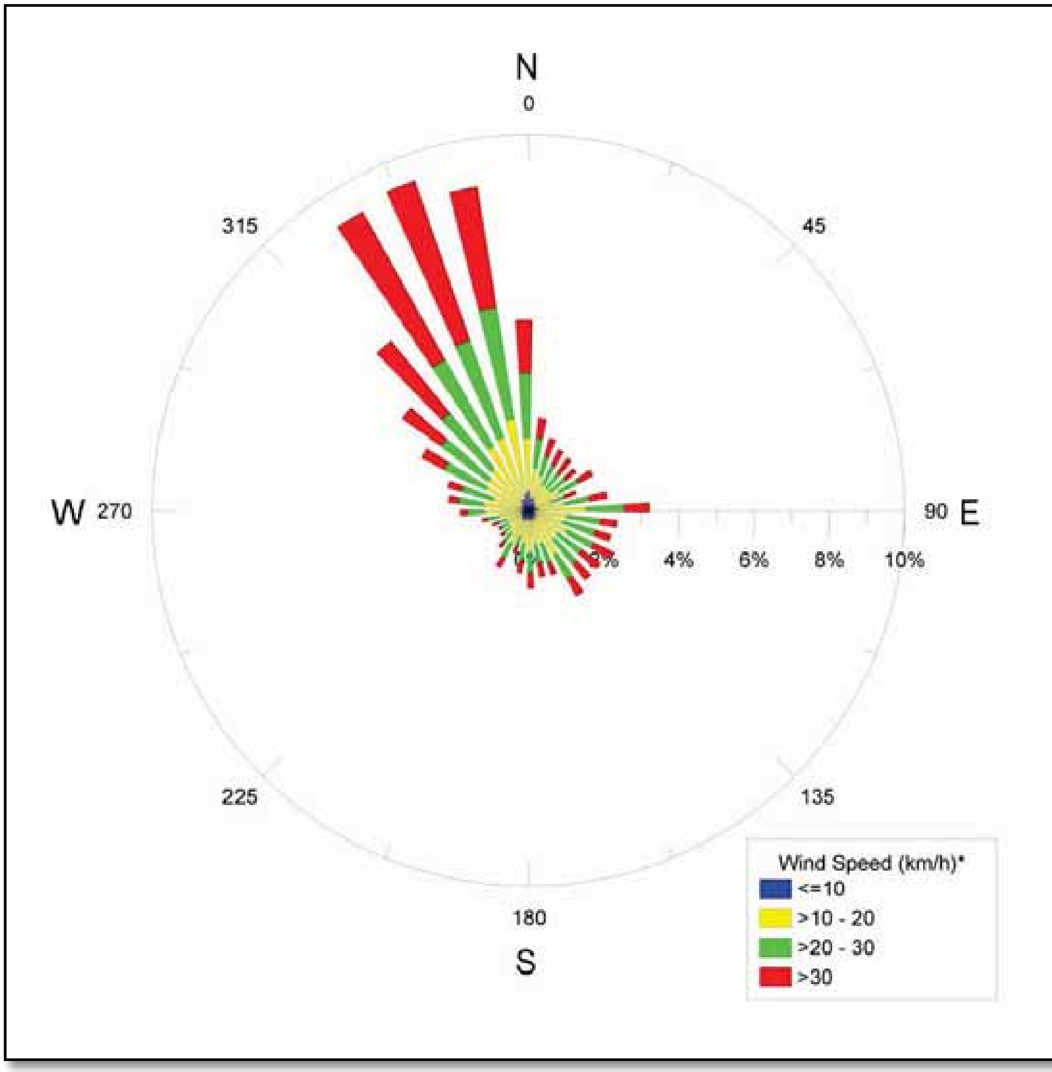
An automatic weather station operated at the Meliadine Gold Project camp from May 1997 through June 2002. It recorded data for the following climate parameters: air temperature; ground temperature at five centimetres deep; relative humidity; precipitation (summer only); wind speed and direction; and net radiation. Historic climate data sets are available for Chesterfield Inlet, 80 kilometres northeast of the camp and Rankin Inlet, 25 kilometres to the south. Due to the proximity of the project to Rankin Inlet, climatic data collected in the hamlet is directly applicable to the project. Mean wind speeds and direction are important considerations in the positioning of various components the mine/mill complex. Figure 3.1 presents a wind rose diagram for Rankin Inlet.

3.2.5 Terrain

The Meliadine project is located in lowlands near the northwest coast of Hudson Bay. The landscape is generally composed of drumlinoid relief on a till plain (Aylsworth, et al., 1984). There are few rock outcrops. Topography is gently rolling with a mean elevation of 65 metres above sea level and a maximum relief of 20 metres. Postglacial uplift still continues.

The terrain in the project area is of glacial and marine origins: most of the area is covered by glacial overburden, marine sediments from Hudson Bay, and lineated glacial eskers. Glacial till soils are generally sandy and silty clay with unsorted aggregate materials. Low-lying areas are poorly drained as a result of a low slope in the landscape, and intermittent streams connect numerous shallow ponds and lakes.

Figure 3-1 Wind Rose Diagram for Rankin Inlet



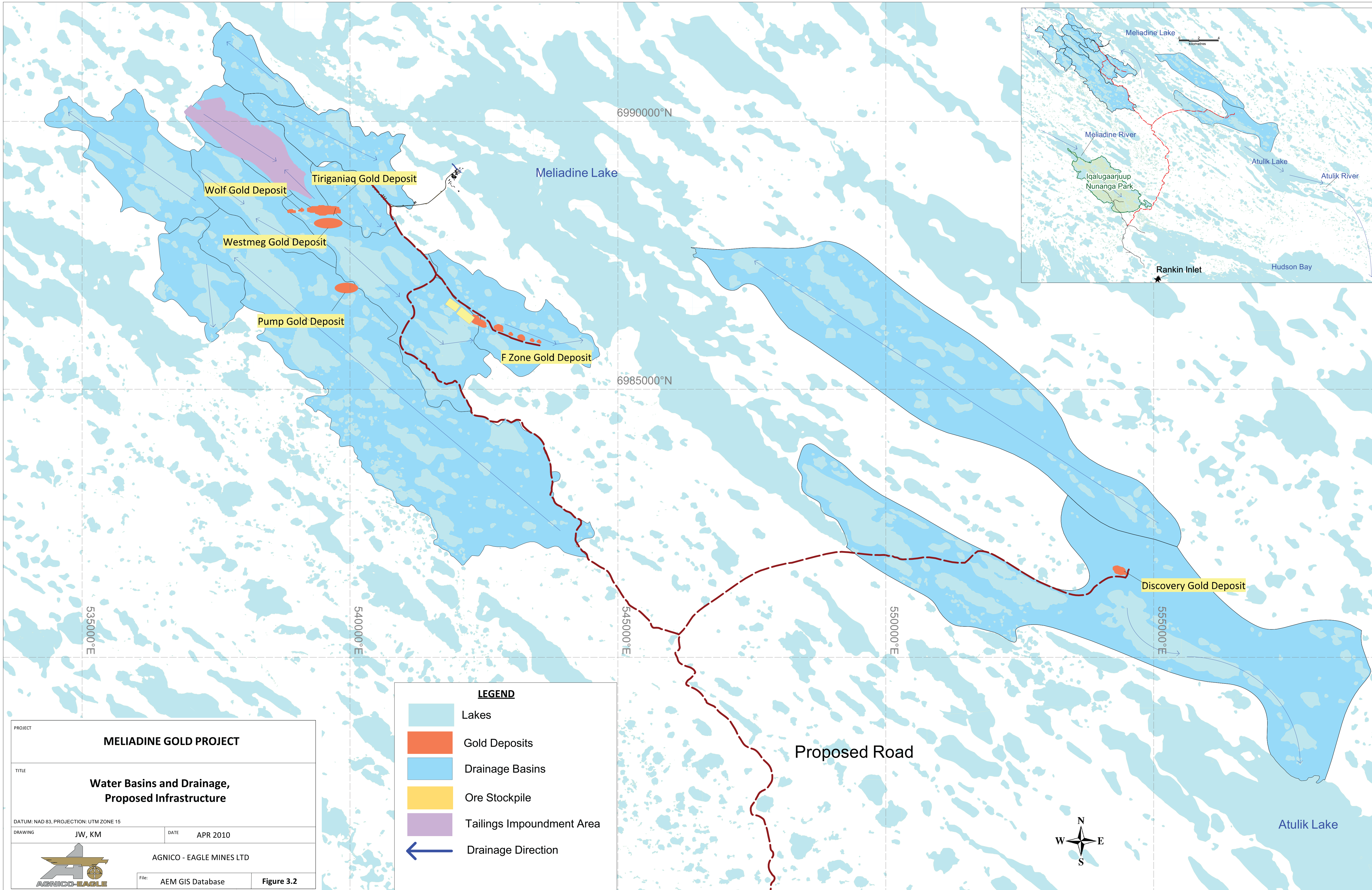
Potential quarries and till borrow pits were identified and investigated (for geochemical and geotechnical considerations), mainly for the purpose of road construction, but also because some are located in the vicinity of the projected surface infrastructure (Golder Associates, 2009b, 2011).

3.2.6 Hydrology

The Meliadine Lake watershed covers 586 square kilometres. The southeast basin of Meliadine Lake, from which water for this mining project would be drawn, is assumed for planning purposes to be isolated from the main lake in late winter, due to the freezing (to the bottom) that occurs across the shallow narrows between the basins. The residual water volume of the basin, not including the two-metre-thick ice, has been calculated at 63.66 million cubic metres.

Hydrometric studies at Meliadine project established stations to monitor water level and flow in order to document the annual hydrologic regime. The results of these studies, from 1997 to 2000 and in 2008, include both “dry” and “wet” years, and show precipitation and runoff patterns similar to those described for other tundra watersheds that have been monitored for many years.

Meliadine Lake has two outlets; the Meliadine River carries about 80 per cent of the flow, and an outlet to Peter Lake on the Diana River takes the balance. The domestic water supply of Rankin Inlet does not come from either of these watersheds. The water-balance studies on the Meliadine system show that the long-term average annual precipitation at Rankin Inlet was 297 millimetres. In a hydrologic year of historic low precipitation (172 mm in 1996-97), the yield was 78 mm or 45 per cent of the annual precipitation; by contrast, in a hydrologic year with historic high precipitation (385 mm in 1998-99), the yield was 239 mm or 62 per cent of the annual precipitation. An evaporation pan showed that summer evaporation was roughly equivalent to summer precipitation, with little if any net input from summer rain. The net input to the annual water balance of the Meliadine River watershed comes from spring runoff, which recharges the lakes and ponds in the sub-basins above Meliadine Lake. The streams draining these water bodies usually run dry after the spring runoff before the late-summer rains. The water basins close to the mine and their directions of flow are shown in Figure 3.2 below.



PROJECT

MELIADINE GOLD PROJECT

TITLE

Water Basins and Drainage, Proposed Infrastructure

DATUM: NAD 83, PROJECTION: UTM ZONE 15

DRAWING	JW, KM	DATE	APR 2010

AGNICO - EAGLE MINES LTD

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File: AEM GIS Database | **Figure 3.2**

3.2.7 Potential for Acid Generation/Metal Leaching

Limited static testing[11] was carried out in 1998 and 2001 as part of metallurgical assessments taking place at the time. In 2005, further static testing was carried out, which added to the basic understanding of the potential for the gold-bearing ore and surrounding waste rock to generate acid and leach trace metals. Generally, test results were conclusive in showing that the host rock types were non-acid-generating; this has been corroborated by more recent testing. The ratios of neutralizing potential to acidifying potential varied from 1:1 to 6:3. The lower values are from ore with a high sulphide content. The sulphide portion of the ore is acid-generating, and the handling of this material will be detailed in the draft Environmental Impact Statement. Shake-flask tests investigated the chemical-leaching potential of the waste rock and mineralized rock; they indicated that some trace metals, in particular arsenic, slightly exceeded the Canadian Water Quality Guidelines for the protection of freshwater aquatic life. Background arsenic levels (1996) are anomalously high on a regional level in soil and water samples collected in the Meliadine region, as shown in Figure 3.3.

In 2008, a detailed geochemical study was initiated using recommended guidelines to characterize the geochemistry of the Tiriganiaq, F Zone and Discovery deposits with a completion date of December 2009. This study obtained a number of samples of waste rock, overburden and ore from each deposit, based on the tonnage of each rock type mined. Static tests and a representative number of kinetic tests[12] were conducted on this material. Concentrates from large samples of the ore derived from the 2007-2008 bulk-sampling program are also being tested. This work had a bearing on the design of the tailings impoundment area and mill processes.

Testing is continuing in 2011 at the Tiriganiaq, F Zone, Wesmeg, Pump and Wolf deposits. The results of this work will be presented in the draft Environmental Impact Statement.

3.3 Aquatic Environment

3.3.1 Water Quality

The Meliadine River watershed did not host commercial or industrial activity prior to this project. The water quality should therefore be close to pristine, factoring in normal global atmospheric pollutants. Aquatic environment studies for the Meliadine West area have established a comprehensive baseline for water quality in the project area. Parameters for analyses included metals, simple hydrocarbons and levels of exotic airborne pollutants deposited by long-range atmospheric transport. Analytical data include water samples from winter, spring, and summer collections. Data for dissolved oxygen under ice were also collected, and in some cases the concentrations of dissolved oxygen were found to be

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[10] Static tests indicate the total potential capacity of the tailings to release metals and acid, by assessing concentrations of acid-generating and acid-neutralizing minerals, sulphur and carbon. Static tests cannot be directly correlated to the natural environment, but provide clues about potential behaviour.

[11] Kinetic tests aim to determine the rates of acid generation and neutralization together with the drainage chemistry over a period of time, usually 20 weeks.

naturally low and below the CWQG guidelines. Additional work was carried out in 2011 to better characterize the water quality under ice in small lakes surrounding the mining area.

The sampling network also established a “control” area outside the basins of active exploration and future operations.

3.3.2 Fish

Fish populations were studied in Meliadine Lake, the Meliadine River and specific ponds and lakes on the peninsula above Meliadine Lake. Nine fish species were identified: lake trout, Arctic char, round whitefish, Arctic grayling, cisco, three and nine-spine stickleback, burbot, and sculpin. The seasonal distribution of fish was studied by deploying various sampling techniques, including gill nets, seines, backpack electrofishing and minnow traps, as well as a fish fence and fyke nets, which allowed the live capture and release of tagged fish. Radio telemetry monitored the distribution and movement of lake trout and Arctic char, which are important resources for local fishermen. A significant stratification of species was noted between Meliadine Lake and the water bodies on the peninsula above it. The distribution of lake trout (all cohorts) was generally restricted to Meliadine Lake, with occasional individuals captured in the first stream or lake above Meliadine Lake. Round whitefish, like trout, were generally restricted to Meliadine Lake. The remaining species, with the exception of Arctic char, were generally found throughout the basins above Meliadine Lake.

Arctic char are typically anadromous within the study area and their distribution and movements were documented by live capture and tagging with both floy tags and telemetry radios. Like lake trout, they were rarely found beyond the first lake above Meliadine Lake.

A fish fence was set up near the mouth of the Meliadine River in 1997, 1998 and 1999 to capture, measure and tag Arctic char returning from the ocean. A reward program offered $5 per floy tag and $25 per telemetry radio to provide a local incentive for returning tags collected from harvested fish. This program was initiated in the fall of 1997 and was terminated at the end of December 2001. A total of 2,543 Arctic char were tagged; more than 850 tags were recovered from local fishers and 656 tagged Arctic char were recaptured either at the Meliadine fish fence or by net during the normal course of the study. The distribution of Arctic char as shown by telemetry data suggest that Arctic char may spawn at numerous locations in Meliadine Lake. Also, telemetry data show that the migration of Arctic char from Meliadine Lake to Hudson Bay is via the Meliadine River and the Peter Lake/Diana River.

Fish-population studies also included developing baseline data for the quality of fish tissue. Samples of Arctic char and lake trout were collected to assay levels of metals and organic contaminants. Due to lake trout longevity, a data-set for lake trout tissue was taken from Parallel Lake; it is intended to serve as a “control” for fish studies. Figure 3.4 shows where fish studies have been carried out from 1997 to 2009. To date, no species of fish at risk was found in the project area.

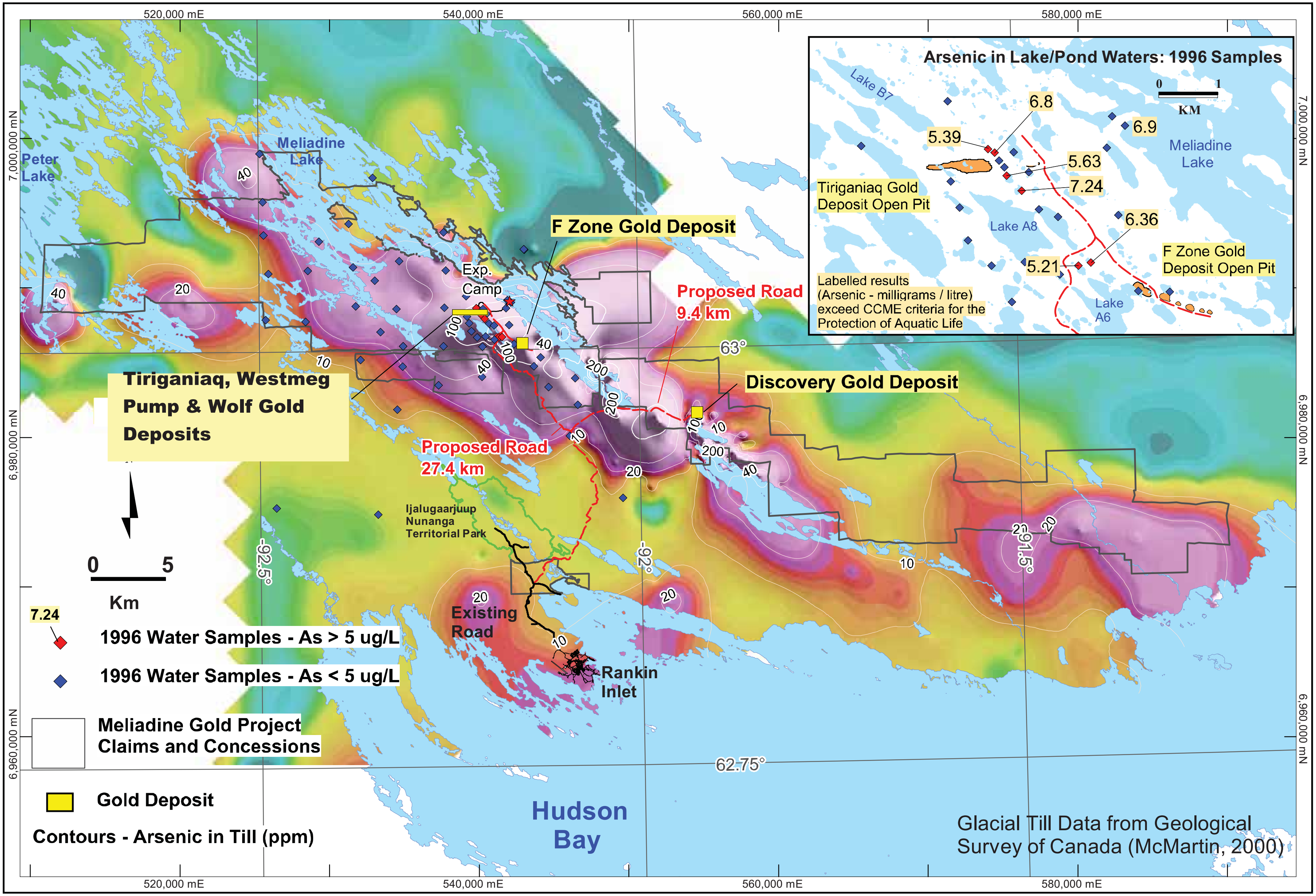


Figure 3-3: Regional Arsenic in Glacial Till and 1996 Lake Water

3.3.2.1 Fish Habitat

Studies of fish habitat focused on the physical and biological parameters of the lakes and streams in the project area. Physical parameter studies documented the shorelines and stream habitats that may be at risk of alteration during the construction and operations of the gold mine, including the water crossings that would be required by an all-weather road from Rankin Inlet to the proposed mine site. The bathymetric profiles of numerous lakes and ponds, including parts of Meliadine Lake, were mapped. Biological parameter studies documented winter oxygen levels in several ponds and lakes, as well as the relative abundance of primary and secondary producers in the aquatic ecosystem of the project area. Although winter oxygen levels in the lakes above Meliadine were very low, several species of fish were found to over-winter there, including Arctic grayling. The diversity of primary and secondary producers found was typical for subArctic aquatic systems.

3.4 Terrestrial Environment

3.4.1 Vegetation

Vegetation studies over the exploration area were initially conducted in 1998 by Page Burt of Rankin Inlet. A comprehensive list of plant species and a description of habitats were prepared. A description of habitat types throughout the project area with a map showing their distribution was developed. Similar efforts were completed in 2008 and 2009 to describe the vegetation and habitats along the proposed roads to the Discovery gold deposit, to the F Zone area and along the proposed all-weather road alignment between Rankin Inlet and the project. Figure 3.5 shows the distribution of various types of vegetation along the road routes and the larger general area. The dominant factor shaping the distribution of habitat types seems to be the amount of moisture available, with wetter areas having more vegetation and ridge tops the least. The greatest species diversity occurs in the transition zone between the wet meadows and the well drained communities on slopes. No plant species at risk of extinction were found in the project area.

3.4.2 Wildlife

The area of the project is within the ranges of 40 bird species and 17 mammal species. An inventory of wildlife species in the region was developed from existing information on the distribution of birds and mammals in Nunavut, and from baseline study results and observations by project staff as recorded in the camp wildlife log.

Wildlife studies of the caribou herds using the project area were initiated in the fall of 1997; the Meliadine project collaborated with the former Government of the Northwest Territories (now Nunavut), in deploying satellite telemetry collars on female caribou. Systematic wildlife studies in the project area were initiated in the spring of 1998, when Arc Wildlife Services Ltd. of Calgary undertook bird and mammal studies. These studies continued through the summer of 2000. Annual data reports were submitted for 1998, 1999 and 2000. Golder Associates continued the studies in 2008 and 2009.

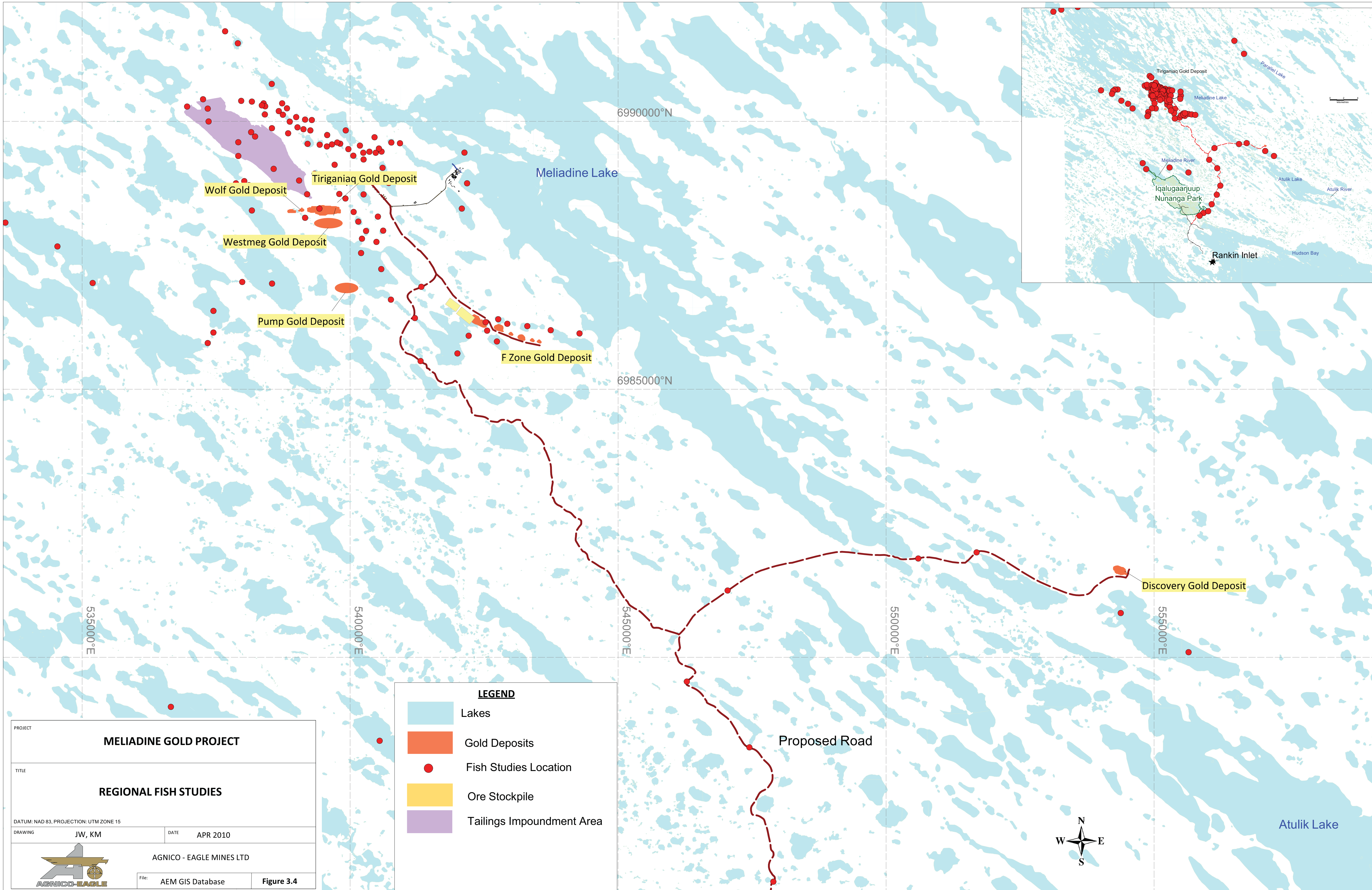
The normal assemblage of bird and mammal species expected for subArctic tundra ecosystems was found. Large birds, such as sandhill cranes, loons and tundra swans, were studied in more detail than other waterfowl and passerines. Swans exhibit high fidelity to their nest sites, returning to the same area each year. Raptors were noted, including rough-legged hawks and peregrine falcons, but no nests were located within the active exploration area of the project. Searches for raptor nest sites along the proposed road alignment were included in 2008 surveys. Mammals present include lemming, ground squirrel, red fox and caribou.

Aerial surveys showed that the project area is on the periphery of the ranges of two caribou herds. Portions of the Qaminirjuaq herd may pass through the project area very quickly in spring - summer and occasionally be present in some years from late October through March. It is at this time of year that most caribou are harvested by Rankin Inlet hunters. Telemetry data also showed that the caribou present in the fall of 1997 included females that travelled north of Chesterfield Inlet for calving in the spring of 1998, which indicates that they may belong to the herd(s) calving in the Lorillard River/Wager Bay area. Figure 3.6 shows the area surveyed for caribou and other large mammals. There are no known caribou calving grounds in or near the general area that could be affected by building and operating the Meliadine gold mine.

No bird or mammal species at risk were found in the project area. No critical habitat for any local wildlife species has been identified in the course of completed baseline studies in the project area. Additionally, no critical wildlife habitat in the local area was identified by the Nunavut Planning Commission in its preparation of the Keewatin Regional Land Use Plan (NPC 1991, revised and submitted for approval by the federal and territorial ministers in June 2000).

3.5 Marine Environment

The Meliadine project will not require any changes to the port facilities in Rankin Inlet. During construction and operations phases of the project there will be an increase in barge traffic. In spite of this, the increase in barge traffic for the mine is not expected to conflict with the barge traffic for the Rankin Inlet community. The project is not, therefore, anticipated to affect the marine environment. However, baseline environmental data of the Itivia harbour area was collected in 2011.



PROJECT

MELIADINE GOLD PROJECT

TITLE

REGIONAL FISH STUDIES

DATUM: NAD 83, PROJECTION: UTM ZONE 15

DRAWING	JW, KM	DATE	APR 2010
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File:	AEM GIS Database		**Figure 3.4**

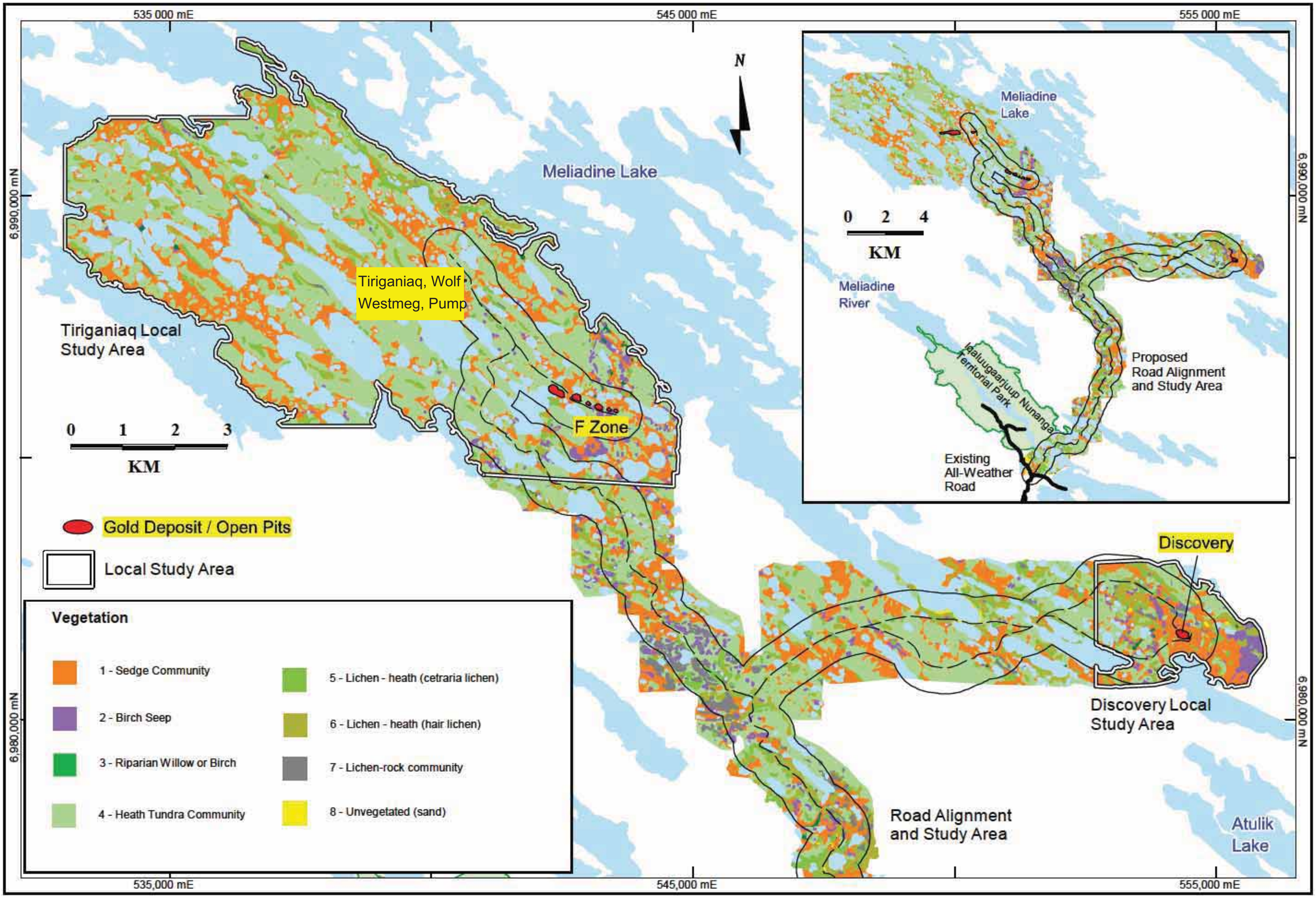

Figure 3-5: Vegetation Studies

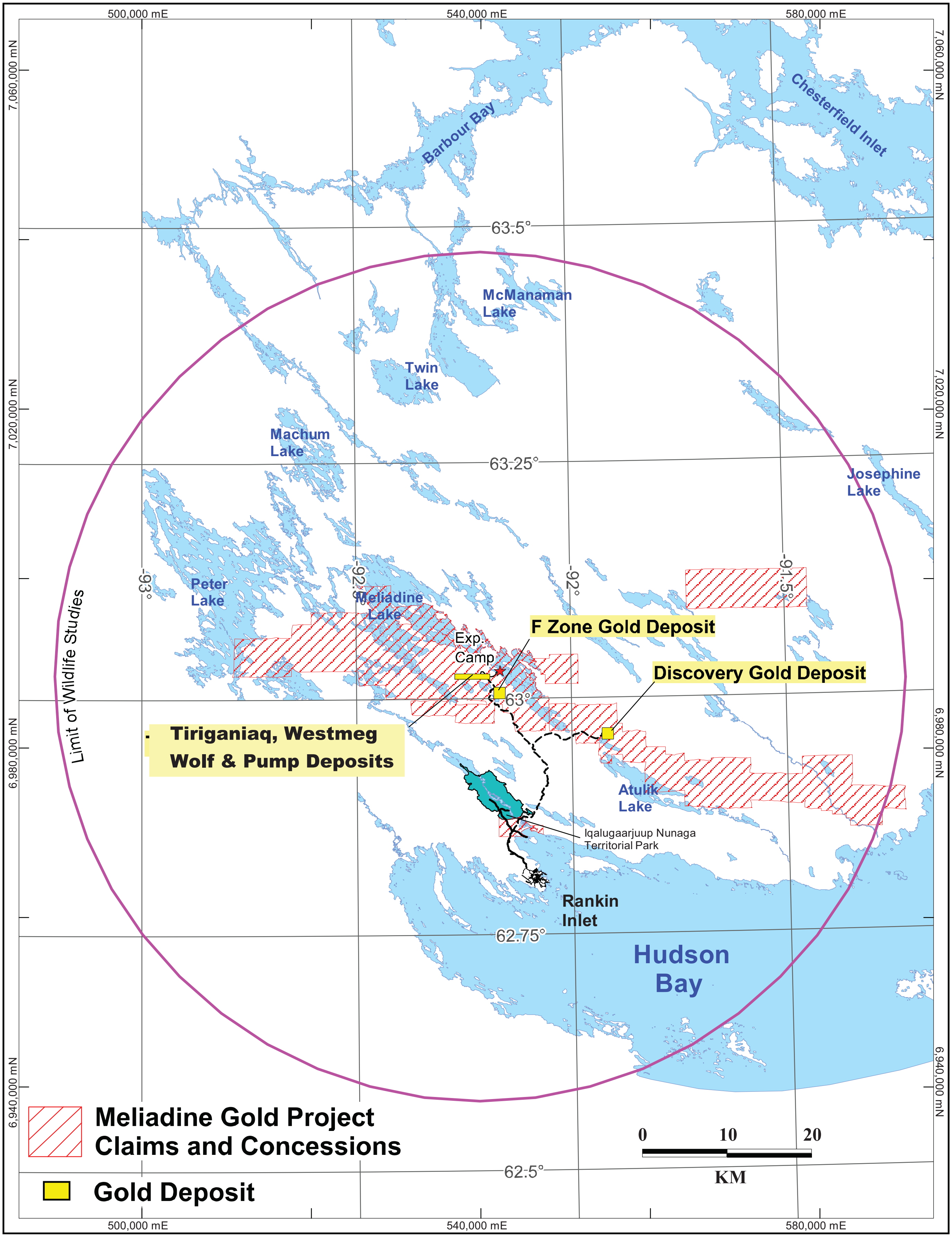

Figure 3-6: Wildlife Survey Area