AGNICO-EAGLE

MELIADINE GOLD PROJECT

Landfill Design and Management Plan

Water Licence 2BB-MEL0914

April 2012

EXECUTIVE SUMMARY

This Landfill Design and Management Plan outlines the conceptual design, operation and closure for a temporary industrial waste landfill as part of Agnico-Eagle Mines Limited's (AEM) Meliadine Gold Project in Nunavut. This Plan was developed to operate a landfill as part of advanced exploration at the Meliadine Gold Project.

The landfill is required for the disposal of non-salvageable, non-hazardous, solid wastes from the advanced exploration activities. The proposed landfill will be located within the area where the future tailing/waste rock storage facility will be located should a gold mine be approved. The camp is expected to accommodate a maximum of 150 to 300 persons during advanced exploration, dependent on the time of year.

The leachate from the landfill is anticipated to be very weak ionic strength (dilute) due to the controls on materials placed in the landfill. Also, abundant landfill cover material is to be found in the area, which will result in sufficient cover to isolate the waste in the landfill from the environment. At the end of its life, the landfill will be covered to a sufficient depth of material to isolate it from the environment, to permanently freeze it within the permafrost layer, and to chemically and physically stabilize it.

During operations, the slopes of the landfill will be protecting from erosion by covered them with waste rock or coarse granular material. Additional surface water and erosion control measures could be incorporated into the landfill design, as appropriate.

To meet NWB guidelines, AEM conducted an environmental overview effects assessment to characterize environmental resources and determine the anticipated environmental effects of a landfill. The primary potential environmental effects from landfill activities included leachate generation, windblown debris, and habitat (vegetation) loss. Given the effective implementation of mitigation plans, no residual environmental effects to valued ecosystem components from construction, operation or closure of the landfill are anticipated.

This Plan will be implemented once approved, subject to any improvements proposed by the NWB.

DISTRIBUTION LIST

Nunavut Water Board

Nunavut Impact Review Board

Meliadine –Project Manager

Meliadine – Environment Coordinator

DOCUMENT CONTROL

Version	Date (YMD)	Section	Page	Revision
1	12/03/30			Version 1 of the Landfill Plan

Plan prepared by AEM staff

Plan approved by:

_____

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1. Introduction

1.1 Project Overview

This Landfill Design and Management Plan outlines the conceptual design, operation and closure for a temporary solid waste landfill as part of the advanced exploration program at Agnico-Eagle Mines Limited's (AEM) Meliadine Gold Project. Advanced exploration includes underground exploration comprising of bulk sample collection and ramp extension while surface activities are largely diamond drilling.

The Meliadine Gold Project is located on Inuit-owned land in the Kivalliq Region of Nunavut, approximately 25 km north of Rankin Inlet. Figure 1-1 provides an overview of the major infrastructure associated with the proposed landfill while figure 1-2 shows its proposed location on the commercial lease AEM holds with the Kivalliq Inuit Association[1].

The Meliadine Gold Project operates under Water License 2BB-MEL0914 issued by the Nunavut Water Board on July 31, 2009. This Landfill Design and Management Plan is one of a series of environmental management plans that have been prepared for the Meliadine Gold Project, with all earlier plans required by terms and conditions of the water licence. The objectives of this Plan are summarized as follows:

1. To define the location, design and operating procedures to be used in the landfill disposal of non-hazardous solid waste generated at the Meliadine camp;

2. To define acceptable/non-acceptable types of solid waste to be placed in the Meliadine landfill; and

3. To define monitoring requirements for the landfill.

A landfill is required for the disposal of non-salvageable, non-hazardous industrial wastes from advanced exploration activities that cannot be incinerated. The Landfill Design and Management Plan was developed in concordance with the best management practices. Hazardous wastes will not be placed in the landfill. All waste materials considered unsuitable for landfill deposition would be packaged for shipment south to a certified waste management company for treatment, recycling and/or disposal.

Dependant on the time of year, the camp is expected to accommodate from 150 to 300 persons during advanced exploration. A four year landfill life has been assumed, June 2012 to June 2016.

To meet NWB guidelines, AEM conducted an environmental overview effects assessment to characterize environmental resources and determine the anticipated environmental effects of the proposed landfill.

[1] The Kivalliq Inuit Association has approved the construction, operation and closure of a landfill on the commercial lease. Their letter of approval is attached.

LEGEND

- Waterbodies
- Tailings Storage Facility
- Possible Borrow Location For Landfill Cover
- Open Pits

537,000 m E

539,000 m E

541

6,990,000 m N

6,990,000 mN

Future Tailings & Waste Rock Storage Facilities

Lake B7

Possible Borrow Location #1 for Landfill Cover

Proposed Landfill

Possible Borrow Location #2 for Landfill Cover

Tiriganiaq

0 0.5 1
kilometres

N
W E
S

MELIADINE LAKE

Fresh water intake

6,989,000 mN

MELIADINE LAKE

Treated Waste water Discharge

540,000 mE

541,000 mE

542,000 mE

6,988,000 mN

PROJECT

MELIADINE GOLD PROJECT

TITLE

PROPOSED LANDFILL

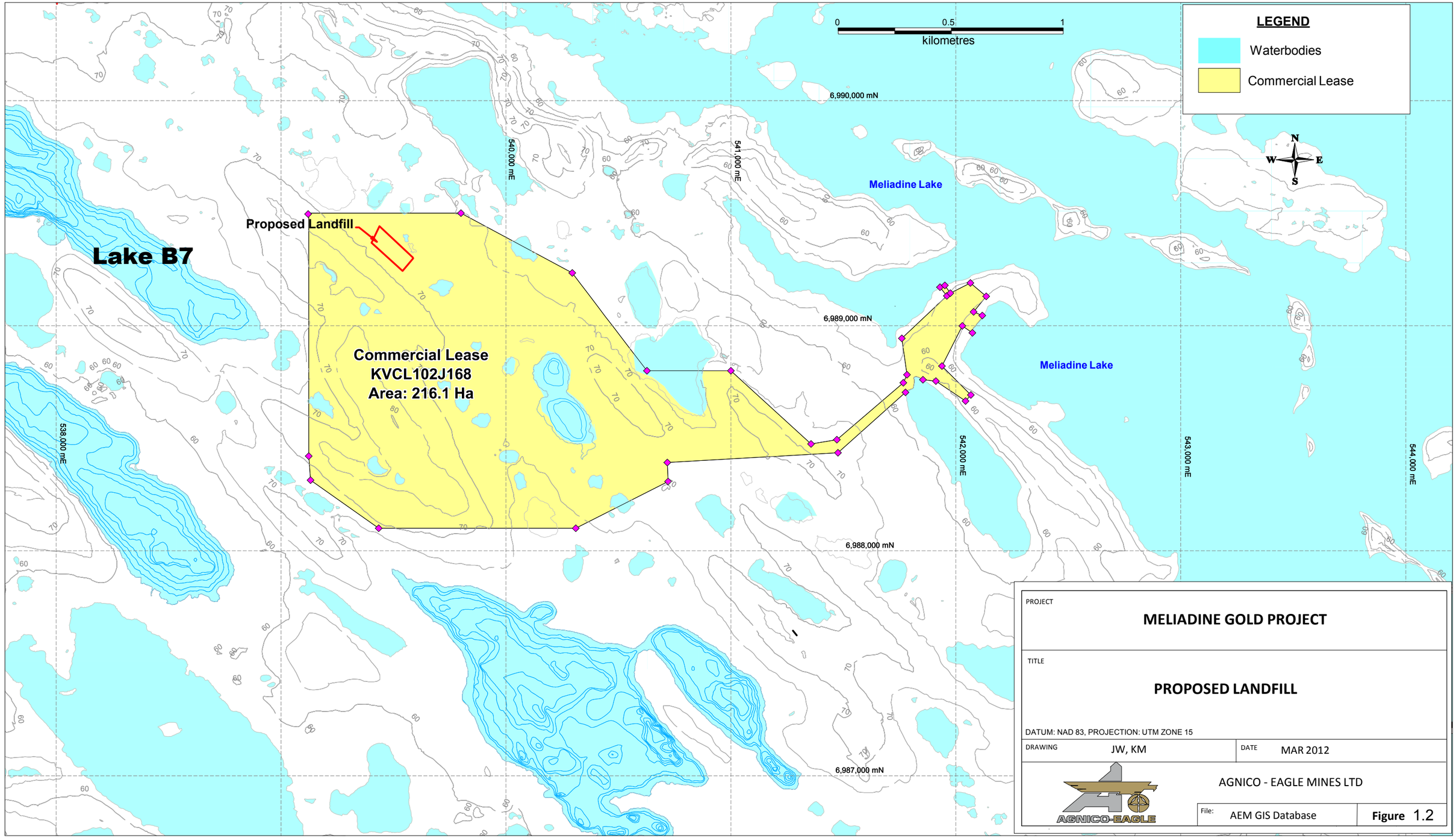
DATUM: NAD 83, PROJECTION: UTM ZONE 15

DRAWING	JW, KM	DATE	MAR 2012

AGNICO - EAGLE MINES LTD

File: AEM GIS Database

Figure 1-1



PROJECT

MELIADINE GOLD PROJECT

TITLE

PROPOSED LANDFILL

DATUM: NAD 83, PROJECTION: UTM ZONE 15

DRAWING	JW, KM	DATE	MAR 2012

AGNICO - EAGLE MINES LTD

File: AEM GIS Database

Figure 1.2

1.2 Project Description

The Meliadine advanced exploration site includes the following structures and facilities:

- Camp, dormitories and kitchen;
- Core shack, storage and maintenance buildings;
- Portal and underground workings;
- Waste rock pads that hold ore stock piles, underground service buildings, and an underground bulk sample facility;
- Roads;
- Granular borrow pits;
- Water management facilities; and
- A proposed industrial waste landfill.

The Meliadine camp is designed to minimize the areas of surface disturbance, stabilize disturbed land surfaces against erosion, and return the land to a post-mining use that is chemically and physically stable, and consistent with past traditional pursuits and wildlife habitat (MGP, 2010a).

1.3 Location of the Landfill

The landfill will be sited considering the following criteria:

- Drainage – sites that drain into areas where water will be collected and monitored as part of the overall site plan are preferred.
- Avoid Ice Rich Soil Excavation – sites where bedrock is at relatively shallow depth are preferred.
- Disturbed Areas – sites that will be within or near areas that will be disturbed as part of the future overall mine plan are preferred.
- Access – sites that are located close to existing access roads are preferred.

The first three criteria are recommendations from the Mine Site Reclamation Guidelines for the Northwest Territories (INAC, 2006).

Based on the above criteria, a landfill is planned east of Lake B7 as shown on figure 1-1. It would be located in the headwaters of the H drainage basin, which reaches Meliadine Lake approximately 1 kilometre to the east. Drainage patterns are poorly defined in the upper reaches of the H basin and are only active during spring freshet and during large rain events.

The landfill will be developed and serve as the non-hazardous solid waste disposal site for four years of advanced exploration, June 2012 to June 2016.

2. Regulatory Setting

Waste management in Nunavut is regulated under the *Nunavut Public Health Act*, the *Nunavut Environmental Protection Act* and the federal *Environmental Protection Act*. AEM is also bound by the terms and conditions of its commercial lease with the Kivalliq Inuit Association and its water licence from the Nunavut Water Board.

In addition to mandatory requirements, a number of waste management guidelines are commonly used in the NWT and Nunavut. The most recent of these was developed for municipal solid waste, and is titled "*Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the NWT*"[2]. While not all of the recommendations provided in this guideline are appropriate for the management of industrial waste such as those generated at the Meliadine advanced exploration camp, those principles considered applicable have been adopted in this Plan.

In addition, the *Mine Site Reclamation Guidelines for the Northwest Territories* (INAC 2006) were followed in this current document regarding specific landfill design and mitigation for impacts pertaining to waste. Where appropriate, recommendations from *Implications of Global Warming and the Precautionary Principle in Northern Mine Design and Closure* (BGC 2003) were also incorporated into this document.

[2] Report was prepared by Ferguson Simek Clark, April 2003, on behalf of the Department of Municipal and Community Affairs, Government of Northwest Territories

3. Plan for the On-Site Disposal of Solid Waste Approach

The strategy for the disposal of solid waste is to first identify and segregate acceptable disposal items from non-acceptable items. Acceptable items that can be disposed of at the on-site facility are those that are non-hazardous, non-putrescible, with a low leachate and heat generation potential. All other materials will either be incinerated or hauled offsite for shipment to a licenced hazardous waste management company. This strategy for limiting the materials that can be placed in the landfill greatly reduces the concentration of constituents in the leachate.

All solid wastes that may contain food waste, food packaging waste or other organic waste that could attract wildlife will be incinerated in the site's incinerator. This will include all garbage from the camp, camp kitchen, site lunchrooms and offices. The ash from the incinerator will be placed in containers (either jute bags or drums) and disposed of in the landfill. Incinerator ash samples will be collected and tested for metals according to the Government of Nunavut Environmental Guideline for Industrial Waste Discharges (Department of Sustainable Development, 2002). Ash that does not meet these guidelines will be packaged in drums and sent to a licensed hazardous waste management facility in the south.

The development of the landfill will minimize the area required for waste storage and the re-handling of waste. The landfill at the selected location will allow any leachate that may be generated to be collected, monitored and managed in the future tailing/waste rock area. The leachate from the landfill is anticipated to be weak due to the controls on materials placed in the landfill and thus site specific landfill leachate management is not considered to be required.

Based on the above strategy, a liner is not considered to be required for the landfill, nor is any special monitoring recommended. However, the landfill will conform to best management practices allowing for orderly landfill development, which reduces the potential for windblown debris.

3.1 Waste Acceptable for Placement in Landfill

The following materials will be acceptable for disposal at the temporary landfill:

- Plastic (except expanded polystyrene);
- Steel, copper, aluminum, iron;
- White goods;
- Wire;
- Wood;
- Fiberglass insulation;
- Fiberglass;
- Roofing;
- Asphalt;

- Concrete;
- Carpet;
- Bricks;
- Ceramics;
- Rubber
- Empty caulking tubes;
- Hardened caulk;
- Clothing;
- Glass including light bulbs, (fluorescent bulbs will require special handling, see below for more details);
- Waste Asbestos (see below for more details);
- Small appliances (with batteries removed);
- Gyproc;
- Ash provided it has cooled to 60ºC or less; and
- Vehicles and machinery provided all liquids, grease, batteries, and electronics have been removed.

Waste Asbestos

Waste asbestos includes any type of material with greater than 1% asbestos by weight (Government of Nunavut, Environmental Protection Service, 2002a). Asbestos that has been immersed or fixed in a natural or artificial binder or included in a manufactured product is not considered waste asbestos, it is considered a hazardous waste (and will be disposed of accordingly). Waste asbestos can either be backhauled off-site for disposal in an approved facility or it can be landfilled. The following are guidelines for landfilling waste asbestos:

- Immediately buried and covered with 0.5 m of cover material;
- Buried where it will not be disturbed; and
- The location should be maintained on a map or diagram for future reference.

The complete *Environmental Guideline for Waste Asbestos* is included in Appendix A.

3.2 Waste Unacceptable for Placement in Landfill

Materials that are not listed above will be unacceptable for placement at the landfill, unless approved in writing by the Meliadine Environment department. These materials include:

- Organic matter including food, septic tank pumpings or sludge from waste water treatment, dead animals, paper, cardboard;
- Food containers and wrappings, unless cleaned;
- Hazardous waste including mercury, medical waste, batteries, solvents, glues, ethylene glycol antifreeze, adhesives (except empty caulking tubes);
- Electronics;
- Petroleum products, including materials contaminated with petroleum products; and
- Expanded polystyrene.

In particular, organic matter will not be accepted in the landfill, thus eliminating the attraction to carnivores and/or raptors. This will be accomplished by requiring all personnel to dispose domestic waste in designated receptacles and by sending all collected domestic waste (e.g. from kitchens, offices and living quarters) to the site incinerator.

Fluorescent Lamp Tubes

Fluorescent tubes contain mercury phosphorus powder and traces of lead and cadmium, which are considered environmental contaminants under the Nunavut *Environmental Protection Act*. The only disposal method for fluorescent tubes is through an approved hazardous waste recycling or disposal facility (Government of Nunavut, Environmental Protection Service, 2003). The *Disposal Guidelines for Fluorescent Lamp Tubes* are included in Appendix A.

At the Meliadine site and Rankin Inlet Itivia Laydown Area, hazardous waste materials will be stored in secure facilities until they can be backhauled for off-site recycling or disposal at an approved facility in another provincial or territorial jurisdiction. AEM has registered as a Hazardous Waste Storage Facility with the Government of Nunavut Department of Environment.[3]

Ozone Depleting Substances

Ozone depleting substances (ODSs) include chlorofluorocarbons (CFCs) or halons. Common sources include refrigeration equipment, air conditioning equipment, motor vehicle air conditioners and fire extinguishing equipment (Government of Nunavut, Environmental Protection Service, 2002b). These materials are hazardous in nature; consequently, all disposal of ODS will take place at an approved facility in another provincial or territorial jurisdiction.

Any equipment containing ozone depleting substances should have the ODS removed by a certified technician prior to disposal in the landfill. The *Environmental Guideline for Ozone Depleting Substances* is included in Appendix A.

[3] Waste Generator Number - NUG100031

3.3 Total Volume Of Waste

An estimate of waste volume is required to estimate the appropriate size of the landfill. However, an exact waste volume is not a critical parameter in the design because of the flexibility of design to accommodate extensions (larger to accept more waste) or contractions (smaller to accept less waste) of the landfill.

For the proposed conservative population of 150 to 300 persons[4], it has been assumed that each person will produce 1 tonne of refuse per year, and that 50% of the refuse by weight can be incinerated (i.e. not landfilled except for the ash). Thus, 100 to 200 tonnes of solid waste would need to be landfilled each year. If it is further assumed that the density of this solid waste is 0.5 tonnes / m^3, then 200 to 400 m^3 of waste would need to be landfilled each year over the four year life of the landfill.

The quantity of ash from the incinerator is estimated to be between 22.5 to 45 tonnes / yr., assuming incineration results in a 70% reduction in mass. Incinerator ash will be packaged in drums or sacks and the whole container landfilled, thereby eliminating any windblown effects.

3.4 Incinerator Ash Testing Protocol

Upon commissioning the new incinerator at Meliadine exploration Camp (a Camp Waste Incinerator - model: SN2000 purchased from Super Nova Manufacturing), an ash testing protocol will be implemented to ensure that the incinerator ash is suitable for disposal in the landfill.

Three ash samples will be collected, (one per month for the first three months the incinerator is in operation), and the leachate tested for trace metals. The samples will be compared to the Government of Nunavut guidelines for solid waste/process residual concentrations suitable for landfill, as described in the Environmental Guideline for Industrial Waste Discharges and presented in Table 3.1 (Department of Sustainable Development, 2002). Following the initial testing, ash samples will be collected and tested annually, or upon a significant change in the source or type of material sent to the incinerator.

If monitoring indicates the ash is above the guidelines and not suitable for landfilling, an investigation will be undertaken to identify the cause and eliminate the source for this exceedance. Ash with elevated metals concentrations will be packaged in drums and sent to a licensed hazardous waste disposal facility in the south.

[4] For conceptual planning of landfill capacity, it was estimated that 300 persons (size of on-site camp facility) will be employed at any one time on-site. Environment Canada's 'State of the Environment InfoBase', Environmental Indicator Series 2003 (http://www.ec.gc.ca), indicates that the per capita non-hazardous solid waste generation in 2000 for Canada was almost 1 tonne per person per year. Thus, for landfill conceptual planning purposes, 300 tonnes of waste has been assumed to be generated each year.

Table 3.1: Guidelines for Solid Waste/Process Residuals Suitable for Landfill

Parameter	Concentration maximum (mg/L)
Arsenic	2.5
Barium	100
Cadmium	0.5
Chromium	0.5
Lead	5
Mercury	0.1
Selenium	1
Silver	5
Zinc	500

NOTE: Standards based on leachate test results

4. Landfill Location And Construction

The proposed location of landfill is shown on figure 1-1 to the east of Lake B7. This is an area of level topography having a nearby source of coarse granular esker material for covering the waste in the landfill. It is anticipated that this landfill will serve as the solid waste disposal facility for 4 years of advanced exploration. The design of landfill will require no exacting survey data or measurement. This is due to the restriction on materials that can be landfilled and the location of the landfill being within the proposed future waste rock and/or tailing storage facilities. These factors reduce the need for leachate collection or control or mitigation measures against vectors such as carnivores and/or raptors. Thus, the main environmental mitigation measure required is a wind screen to reduce windblown debris.

The area to receive waste will be bounded on sides by a granular material or rockfill berm as shown in figure 4-1. The purpose of the berm is to confine the waste and to act as a wind shield to reduce windblown debris. The landfill will be a rectangular shape with the length perpendicular to the prevailing wind direction so that much of the waste will be protected from wind by the berm. The temporary landfill will be oriented so that the main wind direction has a minimal impact on the content in the landfill.

Provided the materials that go into the incinerator are controlled to exclude all hazardous materials (*i.e.*, even small quantities of hazardous waste such as batteries are not disposed in the landfill), then the incinerator ash should be non-hazardous. An ash testing protocol will be implemented to ensure that the incinerator ash is suitable for disposal in the landfill.

4.1 Landfill Protocol For Placement of Material

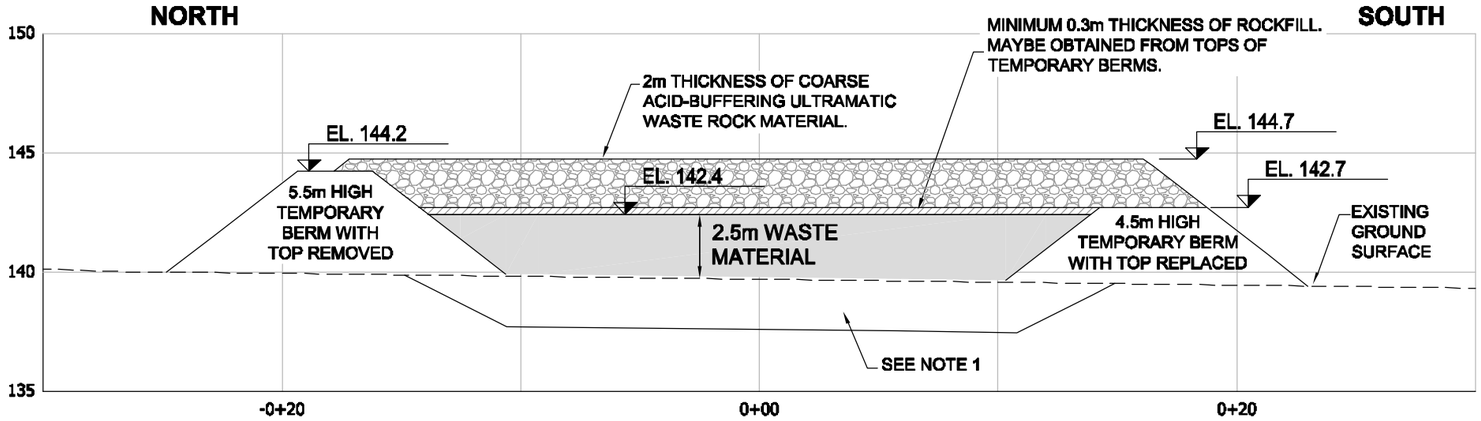
Annual landfill operation will involve clearing of snow prior to spring melt, placement of waste rock or granular material over the waste during the summer period, and placement of a graded cover prior to the winter period of snow accumulation.

An area method of dumping will be used such that materials will be dumped in rows and covered as required. Wastes will be disposed directly on the ground and compacted with heavy equipment against the berm or an existing row of compacted debris. This is followed by a final cover in excess of 1.5 metres of non acid generating rock and/or granular material from the esker as shown on figure 1-1.

4.2 Leachate Management

The leachate from the landfill is anticipated to be of very low ionic strength (dilute) due to controls on materials to be placed in the landfill, and as a result site-specific landfill leachate management is not considered to be required.

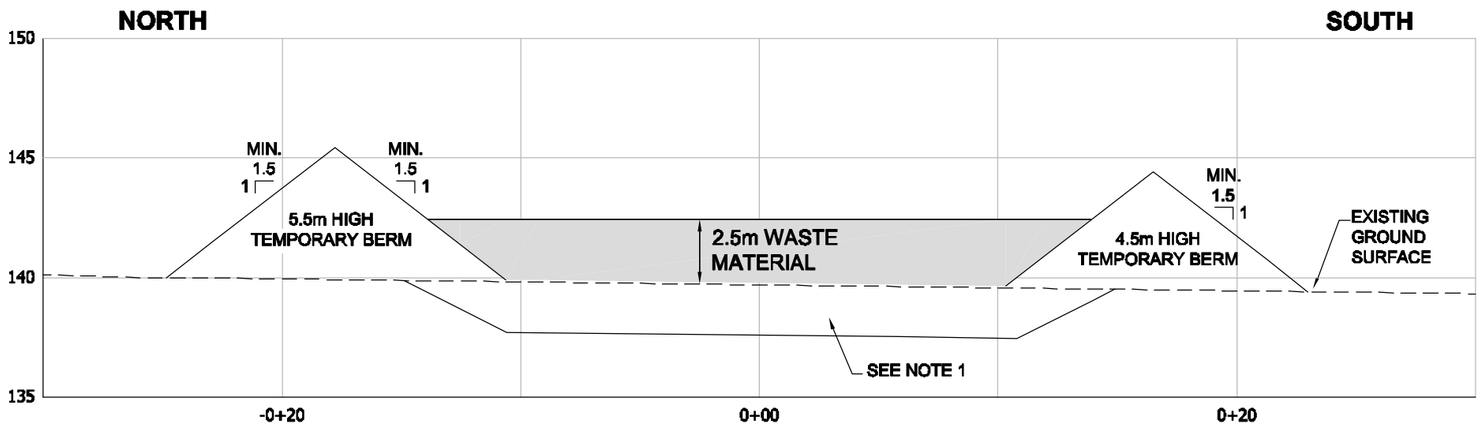
Owing to their placement within the future waste rock/tailing storage facility, the landfill will also become encapsulated within waste rock/tailings. AEM plans to use NPAG waste rock or granular material to surround and cover the landfill wherever practical. A minimum of 2 metre thick layer of cover material would also be placed over the landfill cover as part of planned closure activities for the landfill as shown on figure 4-1.



A - LANDFILL CROSS SECTION (AFTER PLACEMENT OF COVER)

0 2 4 6 8 10

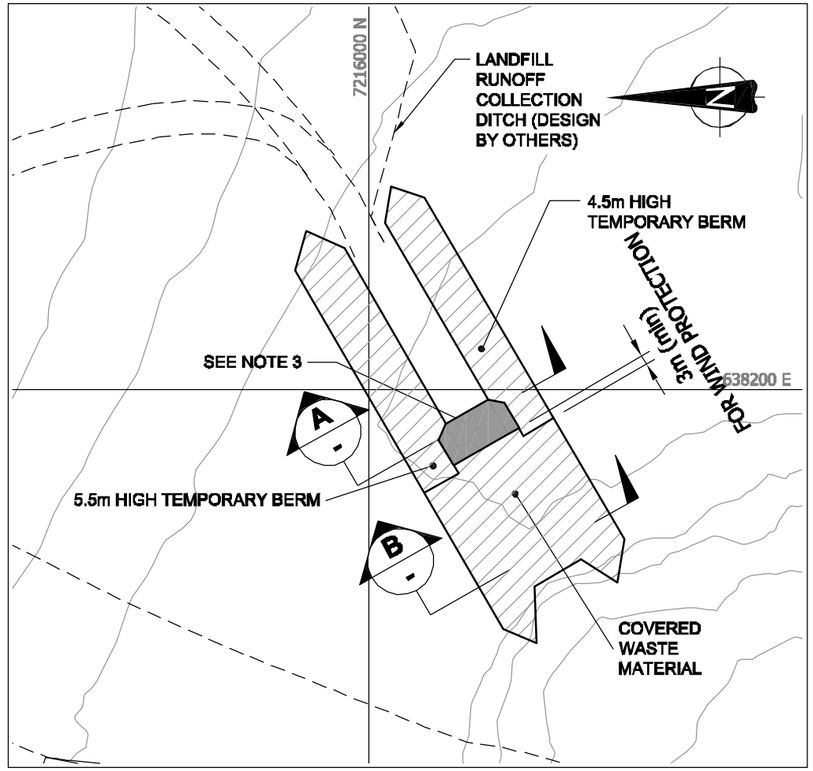
Scale in Metres



B - LANDFILL CROSS SECTION (PRIOR TO PLACEMENT OF COVER)

0 2 4 6 8 10

Scale in Metres



PROGRESSIVE PLACEMENT OF ROCKFILL COVER DURING LANDFILL OPERATION

0 20 40 60 80 100

Scale in Metres

NOTES

1) EXCAVATION SOIL TO BEDROCK OR 2.1m DEPTH, WHICHEVER IS LESS AND REPLACE WITH 100mm MINUS GRAVEL HAVING LESS THAN 5% PASSING THE USS NO.100 SIEVE.
2) TEMPORARY BERM MATERIAL SHALL BE ROCKFILL.
3) ACTIVE AREA WITH EXPOSED WASTE MATERIAL SHALL BE MAXIMUM 15m LONG BY 24m WIDE AREA.

NOT FOR CONSTRUCTION

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RWW
1	NOV-07	-	DETAILED DESIGN	JK	-	-

A1-131395-100-C-0001 — DRAWING NO.

AMEC AMERICAS LTD. MEADOWBANK FEASIBILITY STUDY, APRIL 2005. — REFERENCES

STAMP

PROJECT

AGNICO-EAGLE MINES LIMITED
MELIADINE DIVISION

TITLE

LANDFILL DETAILED DESIGN
LANDFILL #1 CROSS SECTIONS

Golder Associates

PROJECT No. 06-1413-089			FILE No. 061413089-1400-FIG_1		
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CADD	AS	15AUG07			
CHECK			Figure 4-1		
REVIEW					

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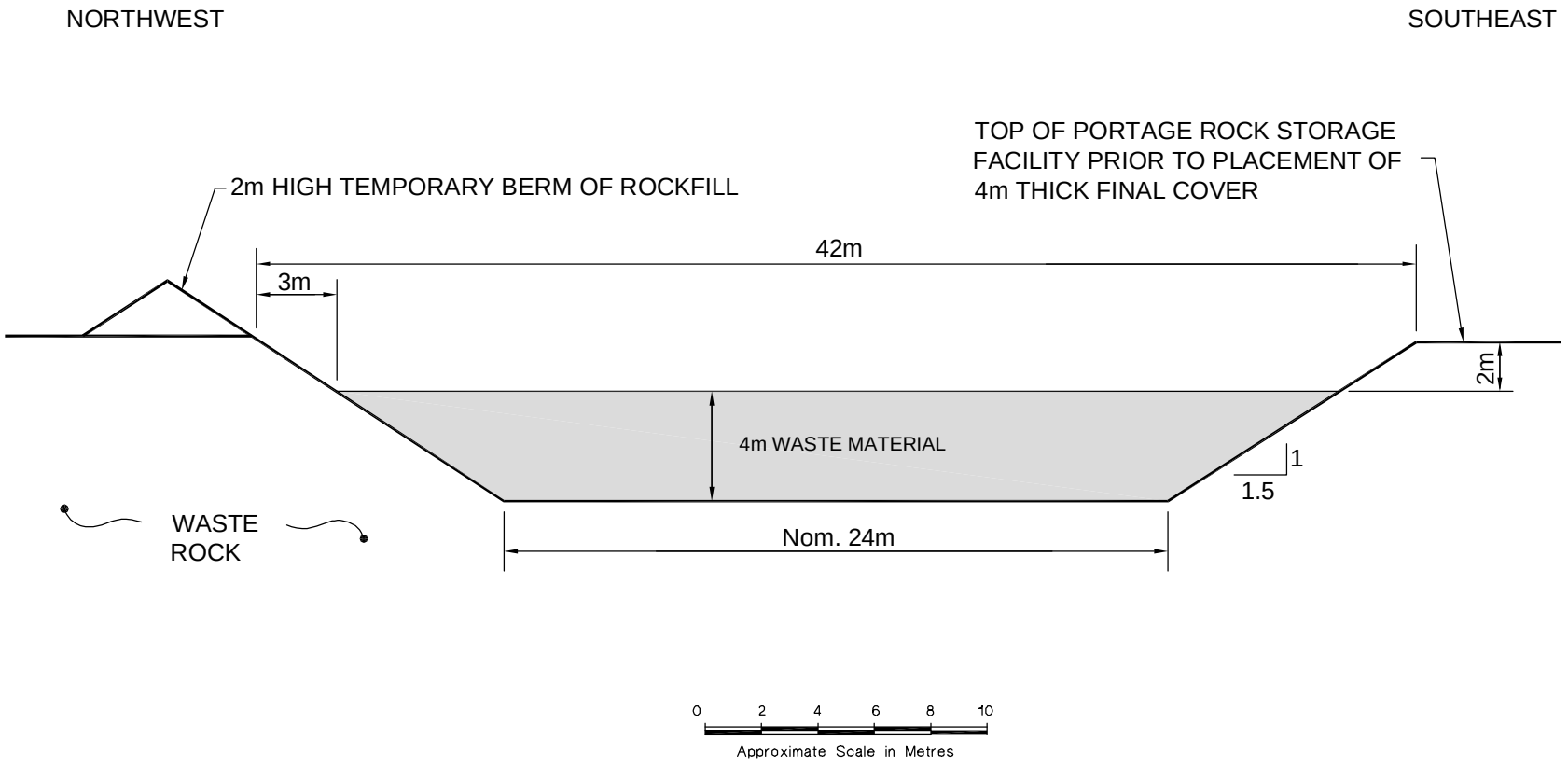

NOT FOR CONSTRUCTION

PROJECT

MELIADINE GOLD PROJECT

TITLE

CONCEPTUAL CROSS SECTION OF LANDFILL #2 PRIOR TO PLACEMENT OF COVER

Golder Associates

PROJECT No. 06-1413-089			FILE No. 061413089-1400-FIG_4	
DESIGN	CW	23MAR07	SCALE AS SHOWN	REV. –
CADD	AS	15AUG07		
CHECK				
REVIEW				

Figure 4-2

5. Landfill Conceptual Operations Plan

The following is a conceptual plan for operating the landfill:

a) Materials Acceptable for Disposal

See Section 3.1.

b) Materials Not Acceptable for Disposal

See Section 3.2.

c) Waste disposal rate

The proposed landfill capacity assumes an average of 200 to 400 m^3 of waste will be landfilled per year.

d) Site Development and Landfilling Method

The site for the landfill will be prepared by first excavating soil down to bedrock or to 2.1 metres depth, whichever is less. The excavation will then be filled with granular material. This will provide a suitable working surface for the landfill for all seasons.

The landfill will be filled progressively in an orderly manner. Specifically, waste will be placed at one end of the landfill at full height and then the active waste area would progressively advance. Areas where the waste has been placed to full height and levelled would be progressively covered by placement of a minimum 0.3 m thickness of rock fill or granular material on top of the waste.

e) Staffing and Equipment

The landfill will not require a full-time attendant. Trucks will haul waste to the landfill and a dozer would be used to spread and level the waste.

f) Leachate Management

The leachate from the landfill is anticipated to be of very weak (dilute) ionic strength due to the controls on materials placed in the landfill. Therefore, specific leachate management is not considered to be required.

g) Surface Water and Erosion Control

The slopes of the landfill will be covered with rockfill or coarse granular material, thereby protecting them from erosion. Additional surface water and erosion control will be incorporated into the landfill design, as appropriate.

h) Operational Inspections

The Meliadine General Manager will designate a landfill inspector to undertake periodic inspections of the landfill operations to verify compliance with the water licence, and operations and closure plan, including the condition of landfill works, evidence of erosion, excessive ponding or unusual landfill settlement, and adequacy of safety measures.

6. Conceptual Closure plan

The following is a conceptual plan for closing the landfill:

a) Estimate of Total Waste Volumes, Tonnage and Life of Landfill

Upon closure, it is estimated that the landfill will have a maximum volume of 1,600 m^3 of waste.

b) Final Cover Design

The waste in the landfill will be covered granular material or waste rock, and should thereafter be stable.

c) Water Management

Contact water from the landfill in closure will continue to be managed using best management practices.

7. Potential Environmental Effects

The landfill will be designed and built as part of the future waste rock/tailing storage facilities. The access road to the Tiriganiaq esker borrow pit will be used to access the landfill. Landfill activities that were identified to have potential effects on valued ecosystem components (VECs) include site preparation and construction, operations and closure.

Potential effects from the landfill on VECs were assessed as follows:

- Degradation of permafrost;
- Change in surface water and groundwater drainage patterns due to the landfill footprint (altered landscape);
- Change in groundwater and surface water quality from leachate percolation, leading to degradation of aquatic habitat;
- Change in air quality from dust and windblown debris;
- Loss of vegetation cover and terrestrial mammal habitat due to landfill footprint;
- Attraction of predatory, small mammals to waste and raptors; and
- Loss of sites of heritage significance or traditional ways of life.

A summary of the environmental overview effects assessment, including mitigation measures and potential for residual effects is provided in Table 7.1.

Table 7.1: Environmental Overview Effects Assessment Summary

Valued Ecosystem Component	Description of Potential Project Effect	Mitigation of Effect	Residual Effect
Permafrost	Permafrost Degradation The construction, operations and closure of the landfill may disturb permafrost.	The landfill will be designed and built within the footprint of the proposed future waste rock/ tailing facilities to minimize ground disturbance and permafrost degradation, as per the Pre-mining Planning Option objectives outlined in the Mine Site Reclamation Guidelines for the Northwest Territories (INAC, 2006).	None
Surface Water and Groundwater Quantity and Distribution	Change in Drainage Pattern The construction, operations and closure of the landfill may alter surface water and groundwater drainage patterns.	The landfill will be designed and built within the footprint of the proposed future waste rock/ tailing storage facilities. Construction control measures are available for existing facilities to limit impacts to groundwater.	None
Water Quality	Change in Water Quality Leachate generation from landfill waste during operations may have an effect on water quality in the nearby water bodies.	Waste that can result in high toxicity leachate will be incinerated or hauled offsite, and will not be landfilled. Incinerator ash will be tested periodically to confirm that it is not hazardous waste. The leachate from the landfill is anticipated to be very low ionic strength (dilute) due to controls on materials to be placed in the landfill. At the end of its life, the landfill will be capped with waste rock and or coarse granular material (> 2m).	None
Air Quality	Change in Air Quality (Emissions and Dust) Emissions, dust and windblown debris from landfill operations may affect air quality.	Emissions and dust deposition are anticipated to be low due to the small quantity of waste and the covering by waste rock or coarse granular material. A rockfill or granular material berm will be constructed to act as a wind shield to reduce amount of windblown debris.	None

Valued Ecosystem Component	Description of Potential Project Effect	Mitigation of Effect	Residual Effect
Vegetation Cover	Vegetation Loss Landfill construction and operation will reduce vegetation.	The landfill will be designed and built within the footprint of the proposed future waste rock/ tailing facilities; therefore there will be no additional effects to vegetation cover. Where appropriate, these mitigation measures will be incorporated into landfill closure.	None
Predatory Mammals	Attraction to Landfill Food and camp wastes attract scavengers during landfill operations including grizzly bear, Arctic fox and wolverine. Mortality of animals may occur if they are a threat to human safety.	Putrescible waste will be incinerated and will not be landfilled and thus there should be no food attraction for animals.	None
Small Mammals	Attraction to Landfill and Habitat Loss Landfill construction and operation will reduce vegetation cover and habitat for small mammals. Food and camp wastes attract scavengers during landfill operations.	Putrescible waste will be incinerated and will not be landfilled and thus there should be no food attraction for animals.	None
Raptors	Nesting and Foraging Habitat Loss Construction and operation of the landfill will reduce vegetation cover and habitat for raptor prey (small mammals and birds).	The landfill will be designed and built within the footprint of the proposed future waste rock/ tailing facility; therefore there will be no additional effects to vegetation cover.	None

Valued Ecosystem Component	Description of Potential Project Effect	Mitigation of Effect	Residual Effect
Breeding Birds	Roosting, Foraging and Nesting Habitat Loss Construction and operation of the landfill will reduce vegetation cover resulting in loss of nesting sites.	The landfill will be designed and built within the footprint of the future waste rock/ tailing facilities; therefore there will be no additional effects to vegetation cover (breeding bird habitat). Progressive reclamation of the landfill will restore small breeding bird habitat.	None
Ungulates (caribou and muskoxen)	Habitat Loss (foraging)	The landfill will be designed and built within the footprint of the proposed future waste rock/ tailing facilities; therefore there will be no additional effects to vegetation loss (ungulate foraging habitat). Progressive reclamation of the landfill will restore foraging habitat for ungulates after mine closure.	None

Valued Ecosystem Component	Description of Potential Project Effect	Mitigation of Effect	Residual Effect
Fish Habitat and Fish Populations	Aquatic Habitat Degradation Leachate generation from landfill waste during operations and closure may have an effect on water quality in the nearby water bodies.	Waste that can result in high toxicity leachate will be incinerated and hauled offsite. It will not be landfilled. Incinerator ash will be tested periodically to confirm that it is not a hazardous waste. The leachate from the landfill is anticipated to be very low ionic strength (dilute) due to controls on materials to be placed in the landfill. At the end of mine life, the landfill would be capped with at least 2 metres of either waste rock or coarse granular material.	None
Sites of Heritage Significance	Loss to Heritage Sites	Project design was adjusted to the extent practicable to ensure that identified/known heritage resources sites are away from planned infrastructure. Sites on the nearby esker were mitigated.	N/A
Traditional Way of Life	Loss to Traditional Way of Life	According to traditional knowledge, there has been little to no human activity in the Meliadine area where the proposed temporary landfill is to be located.	N/A

8. Effects Summary

The primary potential environmental effects from landfill activities included leachate generation, windblown debris and habitat (vegetation) loss. Given the effective implementation of mitigation plans, no residual environmental effects to VECs from construction, operation or closure of the landfill are anticipated. See summary below:

- The leachate that will be generated by the landfill is anticipated to be of very low ionic strength (dilute) due to restrictions on the materials that would be placed in the landfill. A rockfill or granular material berm will be constructed to act as a wind shield to reduce amount of windblown debris.

- Habitat loss will be minimized because the landfill will be designed and built within the footprint of proposed future waste rock/ tailing storage area. With the implementation of terrestrial habitat reclamation strategies, the final surfaces of the landfill will be graded to blend into the existing topography and enhance conditions for wildlife.

- The temporary landfill will be within the footprint of the proposed future tailings/waste rock storage facility for the mine, and at the end of its life be covered with waste rock or coarse granular materials to a minimum of 2 metres.

9. Plan Review And Continual IMprovement

The Landfill Design and Management Plan will be reviewed annually by the Meliadine Project Manager in consultation with the Landfill Inspector and Environmental Coordinator. If necessary, it will be updated every two years as required. Improvements suggested through these reviews would be implemented in consultation with the Nunavut Water Board and the Kivalliq Inuit Association.

10. References

Agnico-Eagle Mines Limited, Meadowbank Gold Project, 2008. Landfill Design and Management Plan - Version 1, Prepared by Agnico-Eagle Mines Limited – Meadowbank Division

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Government of Nunavut, Environmental Protection Service, 2002a. Environmental Guideline for Waste Asbestos.

Government of Nunavut, Environmental Protection Service, 2002b. Environmental Guideline for Ozone Depleting Substances.

Government of Nunavut, Environmental Protection Service, 2003. Disposal Guidelines for Fluorescent Lamp Tubes.

INAC (Indian and Northern Affairs Canada), 2006. Mine Site Reclamation Guidelines for the Northwest Territories.

MGP (Meliadine Gold Project), 2010a MGP Reclamation and Closure Plan, November 2010

MGP (Meliadine Gold Project) 2010b MGP Waste Management Plan, August 2010

Appendix A

Government of Nunavut Environmental Guidelines

Environmental Guideline for Waste Asbestos
Environmental Guideline for Ozone Depleting Substances
Disposal Guidelines for Fluorescent Lamp Tubes