

## Appendix 32-13 : Terrestrial Environment Management and Monitoring Plan (TEMMP)



# **AGNICO EAGLE**

**Meliadine Division**

## **Terrestrial Environment Management and Monitoring Plan**

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**APRIL 2022  
VERSION 4**

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## EXECUTIVE SUMMARY

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Agnico Eagle Mines Limited (Agnico Eagle) is operating the Meliadine Gold Mine (the Project), located approximately 25 kilometres (km) north from Rankin Inlet, and 80 km southwest from Chesterfield Inlet in the Kivalliq Region of Nunavut. Situated on the western shore of Hudson's Bay, the Project site is located on a peninsula between the east, south, and west basins of Meliadine Lake (63°1'23.8"N, 92°13'6.42"W), on Inuit owned land.

This report presents the Terrestrial Environment Mitigation and Management Plan (TEMMP) for the Project (Version 4-), prepared for the Project Final Environmental Impact Statement (FEIS; Golder 2015), and updated per Project Certificate No. 006 (Amendment 001; February 2019; Amendment 002; March 2022). The TEMMP will be reviewed and updated on a regular basis as the Project proceeds through operations, and later into closure and post-closure.

Monitoring will be focused on the wildlife and bird Valued Ecosystem Components (VECs) identified in the FEIS where primary or minor effects pathways have been identified as a result of the Project. Monitoring study design and methods will be consistent with monitoring programs being implemented at other mining operations in Nunavut (e.g., Nunavut Environmental Consulting 2012). In addition, communications with Government of Nunavut Department of Environment (GN DoE) personnel, Kivalliq Inuit Associations (KivIA), Inuit communities, and Kangiqliniq Hunter and Trapper Organizations (KHTO) are ongoing.

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**DOCUMENT CONTROL**

Version	Date	Revision	Project Certificate Condition	Section	Page	Author
1	April 2014	First draft (conceptual plan) submitted in support of the Final Environmental Impact Statement	N/A			Golder Associates Ltd.
2	November 2015	Second draft revised to meet Project Certificate Conditions 38, 39, 53 and 72, and updated Project description.	53	2.3	8	Golder Associates Ltd.
			38 and 39	Appendix II and 4.6.2	31	
			72	4.9 to 4.11	37 to 40	
3	June 2020	TEMMP updated per Project Certificate No. 006 (Amendment No. 001) and the 2020 Saline Discharge Strategy	N/A	2.0	5	Golder Associates Ltd.
4	April 2022	TEMMP updated per Project Certificate No. 006 (Amendment No. 002) and the 2020 Saline Discharge Strategy	See Appendix I	All	All	Agnico Eagle – Environment Department

## ACRONYMS

Agnico Eagle	Agnico Eagle Mines Limited
AWAR	All-Weather Access Road
BMP	Best Management Practices
CESA	Caribou Effects Study Area
CWS	Canadian Wildlife Service
ECCC	Environment and Climate Change Canada
FEIS	Final Environmental Impact Statement
GN	Government of Nunavut
GN DoE	Government of Nunavut, Department of Environment
HHS	Hunter Harvest Survey
IQ	Inuit Qaujimajatuqangit
KHTO	Kangiqliniq Hunters and Trappers Organization
KivIA	Kivalliq Inuit Association
LSA	Local Study Area
MOU	Memorandum of Understanding
NIRB	Nunavut Impact Review Board
NA	not applicable
NT	Northwest Territories
PRISM	Program for Regional and International Shorebird Monitoring
RIBR	Rankin Inlet Bypass Road
RSA	Regional Study Area
TAG	Terrestrial Advisory Group
TBD	To be determined
TEMMP	Terrestrial Environment Mitigation and Monitoring Plan
the Mine	Meliadine Gold Mine
TSF	Tailings Storage Facility
VEC	Valued Ecosystem Component
WPRP	Wildlife Protection and Response Plan
ZOI	Zone of Influence

**UNITS**

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ha	hectares
km	kilometers
km/h	kilometers per hour
m	meter
min	minutes
TPD	tonne per day
≥	equal and more than
<	less than
>	more than
~	about

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**SPECIES LIST WITH ASSOCIATED SCIENTIFIC NAMES**

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**Mammals**

Arctic fox	<i>Vulpes lagopus</i>
Arctic hare	<i>Lepus arcticus</i>
Barren-ground Caribou	<i>Rangifer tarandus groenlandicus</i>
Gray wolf	<i>Canis lupus</i>
Grizzly bear	<i>Ursus arctos</i>
Muskox	<i>Ovibos moschatus</i>
Polar bear	<i>Ursus maritimus</i>

**Birds**

Canada goose	<i>Branta canadensis</i>
Gyr Falcon	<i>Falco rusticolus</i>
Long-tailed duck	<i>Clangula hyemalis</i>
Pacific loon	<i>Gavia pacifica</i>
Peregrine falcon	<i>Falco peregrinus</i>
Rough-legged hawk	<i>Buteo lagopus</i>
Sandhill crane	<i>Grus canadensis</i>
Short-eared owl	<i>Asio flammeus</i>
Tundra swan	<i>Cygnus columbianus</i>

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**SECTION 1 • TERRESTRIAL ENVIRONMENT MANAGEMENT AND MONITORING PLAN**

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**1.1 Overview and Project Summary**

The Agnico Eagle Mines Limited (Agnico Eagle) Meliadine Gold Mine (the Mine), located in the Kivalliq Region of Nunavut, received a Project Certificate (No. 006) from the Nunavut Impact Review Board (NIRB) in February 2015, with Amendment 001 in February 2019 for saline discharge activities and with Amendment 002 in March 2022 for saline discharge activities and the Waterlines Proposal. The Project Certificate, along with the Type A Water License and mine leases authorized for the construction of a gold mine and ancillary facilities including an All-weather Access Road (AWAR), Rankin Inlet Bypass Road (RIBR), barge unloading facilities, lay-down area, and a Fuel Storage Facility in Rankin Inlet. Mine operations commenced in 2019 and the Mine is anticipated to be operational through to 2027, followed by closure and post-closure activities to 2037.

Agnico Eagle has prepared the Terrestrial Environment Management and Monitoring Plan (TEMMP) for the Meliadine Gold Mine, as a requirement of the NIRB Project Certificate and per industry best practices. For the purposes of this document, wildlife refers to wildlife and wildlife habitat, and birds and bird habitat. This document represents management and mitigation measures, updated and intended to provide further detail on the Mine-specific wildlife monitoring components and contributions to other regional monitoring programs, consistent with the Final Environmental Impacts Statement (FEIS, Golder 2014a) and FEIS Addenda (Agnico Eagle 2018, 2020), which identify potential residual effects of the Mine to wildlife and wildlife habitat.

**1.1.1 Interactions with Other Management Plans**

The TEMMP overlaps with other environmental management plans related with the Meliadine Mine, which contain elements of mitigation and monitoring that are relevant to the terrestrial environment. The following are examples of others management plans interacting with the TEMMP:

- Risk Management and Emergency Response Plan;
- Spill Contingency Plan;
- Hazardous Materials Management Plan;
- Road Management Plan;
- Dust Management Plan;
- Wildlife Protection and Response Plan (WPRP).

**1.2 Concordance with Terms and Conditions and Terrestrial Commitments**

The NIRB Project Certificate No. 006 (Amendment 002) for the Meliadine Mine includes Terms and Conditions specific to wildlife and wildlife habitat. Relevant Terms and Conditions are listed in Appendix I.

Agnico Eagle has established several programs that involve collaborations with regional initiatives and contribute to monitoring cumulative effects. These include:

- **Caribou Collar Program:** Supporting the Government of Nunavut's (GN) caribou satellite-collaring program for the Qamanirjuac herd (and other herds in the Kivalliq Region that may interact with the Mine), facilitating monitoring of cumulative effects at the herd level.
- **Regional Muskoxen Surveys:** Agnico Eagle has provided the GN Department of Environment (GN DoE) with in-kind contributions and support for previous muskoxen surveys and will continue to do so.
- **Hunter Harvest Program:** Agnico Eagle renewed its Collaboration Agreement with the Kangiqliniq Hunters and Trappers Organization (KHTO) to develop and implement a methodology to document caribou harvesting around the Meliadine Mine, and to participate in Mine site studies and monitoring. This will contribute to an understanding of cumulative effects by increasing understanding of the regional distribution and seasonality of hunting.
- **Raptor Monitoring Program:** Agnico Eagle in collaboration with the Arctic Raptor Project to develop and implement the raptor monitoring program. This will directly align monitoring efforts at Meliadine with this long-term regional research program which already involves government, non-government, First Nations, and academic partnerships.
- **Waterfowl and Shorebird Monitoring:** Agnico Eagle, in collaboration with Environment and Climate Change Canada (ECCC), have agreed to implement the Program for Regional and International Shorebird Monitoring (PRISM). This will directly align monitoring efforts at Meliadine with other Agnico Eagle properties for waterfowl and shorebirds.
- **Wildlife Surveys:** Agnico Eagle in collaboration with the KHTO will conduct wildlife surveys along the AWAR, the waterlines and with environment technicians around the Mine site. This will contribute to an understanding of cumulative effects by collecting routine wildlife survey data (including caribou) and assist in anticipating large herd migrations, communicating with the KHTO and managing mine activities during migration events.

### 1.3 Principles and Adaptive Management Framework

This TEMMP outlines the policies, practices, designs, and procedures that Agnico Eagle will implement to reduce Mine-related effects to wildlife and wildlife habitat. The TEMMP is based primarily on experience at the Mine to date and previous experience at the Meadowbank Mine, but also includes lessons learned at other Nunavut mines and mines in the Northwest Territories. The intent is to reduce effects to wildlife and maintain safety for wildlife and personnel at the Mine site. The effectiveness of mitigation and management practices and policies is determined through this program. References to operating procedures relevant to wildlife mitigation and management will be listed in this document.

The TEMMP is designed to monitor potential residual effects of the Mine on wildlife habitat, wildlife distribution, and local wildlife abundance when mitigation strategies are implemented during operations. The TEMMP is guided by the following principles:

- to set achievable goals and measurable objectives based on input from the communities, the government, and other stakeholders;
- to use the results from monitoring for adaptive management actions (e.g., additional mitigation practices, modify objectives or study designs, or special studies to better understand effects);
- to incorporate community and Traditional Knowledge (TK) and Inuit Qaujimajatuqangit (IQ), Traditional and Community Knowledge; and
- to design studies and data collection protocols that are consistent and standardized with other programs in the region so that data can be used by government to assess and manage cumulative effects.

The principles are linked to an adaptive management framework for monitoring caribou and other wildlife. It is recognized that some management actions may not be identified initially, but likely determined in response to the outcome of monitoring programs. Therefore, adaptive management can be considered as the process of ‘learning by doing’. Importantly, the process of adaptive management is collaborative and requires input from communities, local knowledge and IQ, government, and other stakeholders. The framework is based on three (3) questions that are related to the goals of the monitoring program. These questions are as follows:

- 1) Why do we monitor?
- 2) What components should we monitor?
- 3) How do we monitor the selected components?

The overall reason why we should monitor wildlife is to follow-up on the concerns that communities, government, and regulators have with respect to how the Mine will influence the ecosystem.

### **1.3.1 Goals Determination**

The first goal is related to the different types of monitoring that are typically completed at a Mine, such as the following:

- testing effects predictions, which can be related to measuring the response of the environment or population (i.e., monitoring component) to Mine stressors, and/or testing the assumptions associated with the predictions;
- testing the effectiveness of environmental design features and mitigation policies, practices, and procedures; and
- meeting and fulfilling regulatory requirements.

The information collected through the different types of monitoring is used to provide recommendations regarding study designs and sampling methods (e.g., frequency and duration of sampling), and possible changes to components of the TEMMP (another element of adaptive management). The results from monitoring can be used to increase the confidence of impact predictions in future environmental assessments. Another type of monitoring is contributing to the assessment and management of cumulative effects by government. The TEMMP for the Mine uses appropriate and standardized study designs and methods so that the data from the Mine and other existing mining operations can be used to measure cumulative effects on wildlife.

The second goal is to determine what components of the environment and population should be monitored. Monitoring components for wildlife are based on the effects pathways evaluated in the FEIS, which originate from the areas of public concern identified by communities and interveners during the FEIS process.

Monitoring components broadly include wildlife, habitat, and people. To clarify the people aspect, people would be included as a component related to the effects pathway of hunter use of the AWAR. For each of the three broad components, there could be one or more monitoring themes. After determining the monitoring themes that will be completed for each component and the type of monitoring each theme falls under (e.g., testing predictions or verifying mitigation), a set of clear and measurable objectives need to be defined. The objectives will inform the appropriate spatial and temporal scales of the monitoring, and the study designs and sampling methods.

### 1.3.2 Objectives Determination

The objectives must be achievable and linked to the different types of monitoring. The ability to achieve objectives is often related to the limitations in associated measurement endpoints or variables, which should have the following attributes:

- good knowledge of the monitoring variable to provide confidence in interpreting the results;
- accessibility and repeatability of collecting robust monitoring data (i.e., practical and cost-effective measurement endpoints);
- high signal to noise ratio (can separate mine-related changes in the variable relative to natural factors); and
- provide reliable information for adaptive management.

## 1.4 Effects Pathways

The main effects pathways based on the FEIS (Golder 2014a) and FEIS Addenda (Agnico Eagle 2018 and 2020) that will be addressed in the TEMMP include the following:

- the physical Mine footprint results to habitat loss and causes habitat fragmentation;
- sensory disturbance can change the access to valuable habitat, alter wildlife behavior, and modify movement pattern (distribution);

- accessibility to larger areas for harvesting wildlife can affect wildlife populations;
- disruption or alteration of caribou migration routes due to the Mine or Mine-related activities;
- permanent alteration in wildlife habitat following the closure of the Mine; and
- effects on wildlife populations and their distribution can change their availability for traditional and non- traditional use.

The evaluation of impacts to wildlife VECs considers the entire set of primary pathways that influence a particular assessment endpoint (e.g., effects to caribou population and caribou harvesting opportunities as a result of direct and indirect changes to habitat, behaviour, movement and harvesting). Rather, the relative contribution of each pathway is used to determine the effect of the Mine (and other developments) on an assessment endpoint, which represents a weight of evidence approach (i.e., evaluating the persuasiveness of evidence indicating that a Mine-related effect is occurring). The Mine area is not particularly rich with wildlife abundance, consequently, the range of natural variability is quite high which yields a high signal to noise ratio and makes statistical power difficult to achieve. Consequently, a weight of evidence approach will be taken for identifying any trends in wildlife metrics that may be affected by the Mine. Reporting will be completed annually with any identified trends reported and findings will be reviewed by the GN DoE. Opportunities to adaptively change the TEMMP based on feedback and discussions with the GN DoE and stakeholders will be possible after reviewing the annual reports.

Results from the monitoring studies are used to provide feedback to mine operations to determine if the goals and objectives are being met. Depending on the results, actions may be considered such as modifying and/or implementing additional mitigation. Similarly, changes to the objectives and/or study methods may be required if it is determined that the measurement variable has a low sensitivity to detect mine-related changes or that the scale of the response does not match the objective. The results are shared with the communities, government, and other people interested in the Mine through annual monitoring and comprehensive analyses reports, and meetings. As part of the adaptive management framework, any changes to the monitoring program would need to include input from the communities and government.

Section 3 describes the mitigations measures to be implemented at the Mine site.

## 1.5 Community Consultation

Involving communities in wildlife mitigation and monitoring is important so that local knowledge can be incorporated, and community members can assess how well Agnico Eagle is doing at reducing effects to wildlife, and to identify further mitigation. Agnico Eagle, in collaboration with the KHTO, will carry out a portion of the monitoring at the Meliadine Mine site, as feasible, and will continue to provide opportunities for communities to share their views. Recommendations for including local and traditional knowledge in wildlife mitigation and monitoring include the following:

- including input from communities to reflect their priorities in the TEMMP;

- providing opportunities for community members to participate in monitoring (e.g., KHTO);
- involving community representatives in adaptive management;
- providing opportunities for ongoing visits to the Mine by community representatives;
- providing updates to communities as the Meliadine Mine progresses;
- initiating a community-based monitoring survey along the AWAR; and
- using public education materials and signage on conservation and hunting from the Mine.

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## SECTION 2 • PROJECT DESCRIPTION

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The Meliadine Mine is located approximately 25 kilometers (km) north of the Hamlet of Rankin Inlet, Nunavut. The Mine is largely on Inuit Owned Lands (IOL RI-01, RI-02) with some supporting infrastructure located within the municipal boundaries of the Hamlet.

The Mine is composed of five known gold deposits: Tiriganiaq, F Zone, Pump, Wesmeg, and Discovery. The current mine plan consists of development of the Tiriganiaq gold deposit (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) and one underground mine (Tiriganiaq Underground). A conventional gold milling circuit is used to extract and recover the gold with tailings reporting to a tailings storage facility (TSF). Besides other normal mine infrastructure, the Mine site has a power plant, fuel tank farm, accommodation complex, water management ponds and a sewage treatment plant – all common features of Arctic mines. The AWAR provides access between Rankin Inlet and the Mine, which is operated with controlled and limited public access.

The AWAR and the RIBR provide access between Rankin Inlet and the Mine. These are controlled access, single lane roads, and approximately 34 km long. Saline discharge activities were approved through Amendment 001 of the NIRB Project Certificate, to transport excess saline groundwater by truck along the AWAR and the RIBR from the Meliadine Mine site to the Itivia Fuel Storage Facility for discharge via a pipeline and diffuser into the marine environment in Melvin Bay during the open water season.

The construction of a waterlines associated with saline water management infrastructures was approved in March 2022 through Amendment 002 of the NIRB Project Certificate due to the continued need to manage an increased volume of saline effluent from underground mines. Once completed, the waterlines will convey treated saline effluent from the Meliadine Mine to Itivia Harbour in Rankin Inlet along the AWAR and the RIBR instead of transporting the saline water by trucks.

### 2.1 Study Area Boundaries

Terrestrial study area boundaries were delineated based on the predicted spatial extent of the Mine-related effects and the life history attributes of wildlife valued ecosystem components (VECs) potentially influenced by the Mine. The following 3 spatial boundaries were used to assess effects on the terrestrial environment (see FEIS Volume 6 for figures):

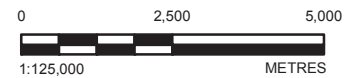
- local study area (LSA) was used for small-scale direct and indirect effects from the Mine, which consists of the mine site, mine roads, Rankin Inlet infrastructure, and the AWAR;
- regional study area (RSA) was used to assess the combined direct and indirect effects from the Mine on permafrost, soils and terrain, plant and plant communities, and wildlife; and
- caribou effects study area (CESA) was used to assess the incremental and cumulative effects from the Mine and other developments.

The Mine site layout, location and local and regional study area boundaries are depicted in Figure 1 and 2 and described in the following sections.



**LEGEND**

- MINE FOOTPRINT
- MINE INFRASTRUCTURE
- APPROVED PROPOSED TERRESTRIAL LOCAL STUDY AREA (LSA)
- ALL-WEATHER ACCESS ROAD (AWAR)
- RANKIN INLET
- WATERCOURSE
- WATERBODY
- TERRITORIAL PARK




**REFERENCE(S)**  
1. BASE DATA OBTAINED FROM AGNICO EAGLE LIMITED.  
2. DATUM: NAD83 PROJECTION: UTM ZONE 15

**CLIENT**

 **AGNICO EAGLE MINES LIMITED**

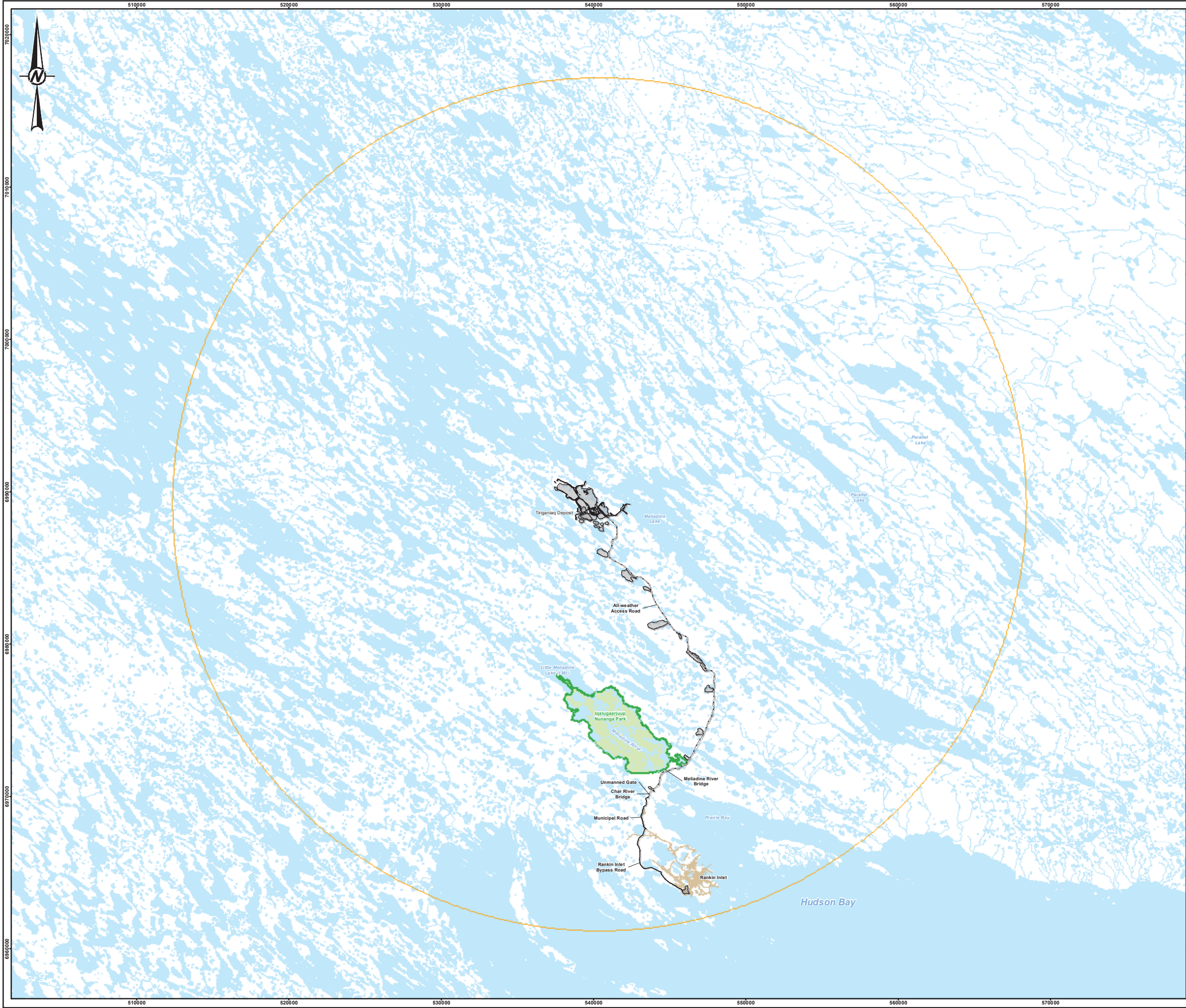
**PROJECT**  
**MELIADINE GOLD PROJECT**  
**NUNAVUT**

**TITLE**  
**PROJECT LOCAL STUDY AREA**

 <b>GOLDER</b>	CONSULTANT	YYYY-MM-DD	2020-01-21
	DESIGNED	KB/CLT	
	PREPARED	CDB	
	REVIEWED	CLT/CD	
	APPROVED	CLT	

PROJECT NO.	CONTROL	REV.	FIGURE
19122039	3000	0	1

R:\TH\Yisuraby\CAD-GIS\Client\Agnico\_Eagle\_Mines\_Ltd\Meliadine\_Gold\_Project\08\_PROJECT\SI\083703\02\_PRODUCTION\6000.MXD\Report\TEMP\168703\_5000\_FIG\_1\_3\_2\_Regional\_Study\_Area.mxd PRINTED ON: 2019-03-13 AT: 2:52:35 PM



**LEGEND**

- MINE FOOTPRINT
- MINE INFRASTRUCTURE
- REGIONAL STUDY AREA (RSA)
- ALL-WEATHER ACCESS ROAD (AWAR)
- RANKIN INLET
- WATERCOURSE
- WATERBODY
- TERRITORIAL PARK

0 5 10  
1:250,000 KILOMETRES

**REFERENCE(S)**

1. BASE DATA OBTAINED FROM AGNICO EAGLE LIMITED.  
2. DATUM: NAD83 PROJECTION: UTM ZONE 15

CLIENT

**AGNICO EAGLE MINES LIMITED**

PROJECT

**MELIADINE GOLD PROJECT  
NUNAVUT**

TITLE

**PROJECT REGIONAL STUDY AREA**

	CONSULTANT	YYYY-MM-DD	2020-01-21
		DESIGNED	KB/CLT
		PREPARED	CDB
		REVIEWED	CLT/CD
		APPROVED	CLT

PROJECT NO.	CONTROL	REV.	FIGURE
19122039	3000	0	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

### 2.1.1 Local Study Area

The approved terrestrial LSA boundary is presented in the 2014 FEIS (Volume 6, Section 6.1.1, Golder 2014a) and includes three Mine components that cover three distinct geographical locations covering a total of 10,598 ha:

- the Mine site and associated infrastructure, which includes a 500 m buffer;
- the AWAR with a 1,000 m buffer on either side of road; and
- the footprint of the Hamlet of Rankin Inlet (no buffer applied).

The map of the LSA can be found in the Figure 1

#### 2.1.1.1 Boundaries Rational

The LSA boundary was defined based on the anticipated spatial extent of the immediate direct (e.g., Mine footprint) and indirect (e.g., dust deposition) effects from the Mine on the surrounding terrestrial environment, including soils, vegetation, and wildlife (FEIS Volume 6; Figure 6.1-1; Golder 2014a). The LSA for the anticipated mine site was defined to encompass the expected spatial extent of potential changes in water quantity and air quality directly related to the Mine.

### 2.1.2 Regional Study Area

The RSA encompasses the entire Mine footprint, including the AWAR and Rankin Inlet infrastructure (Figure 2).

During baseline data collection activities between 1998 and 2011, the Mine RSA was 520,000 ha in size to encompass the potential zone of influence (ZOI) on caribou from mining activities as described by Johnson et al. (2005). In 2012, the RSA was reduced to 280,000 ha (i.e., radius of 28 km centered on the Mine site) because of increased knowledge about the effects from disturbance on barren-ground caribou (Boulanger et al. 2009; Boulanger et al. 2012), and based on an estimated 14 km ZOI on caribou from the mine site. Recent analysis has suggested that caribou are 4 times more likely to occur in areas greater than 11 to 14 km from the Ekati-Diavik mine complex (Boulanger et al. 2009; Boulanger et al. 2012). The RSA extends an additional 14 km beyond the ZOI so that effects from the mine can be assessed through wildlife monitoring.

#### 2.1.2.1 Boundaries Rational

The RSA was selected to measure the existing baseline conditions at a scale large enough to capture the maximum predicted spatial extent of the combined direct and indirect effects (i.e., ZOI) from the Mine on soils, vegetation, and wildlife (FEIS Volume 6; Figure 6.1-2; Golder 2014a). This area is intended to capture effects that could extend beyond the immediate Mine footprint, such as noise, lights, smells, and other factors that can indirectly affect the environment at a distance. Cumulative effects from the Mine and other developments in the RSA, if present, can be assessed at this scale for VECs that exhibit little to no movement within the RSA, such as geology, permafrost, terrain and soil, and plants and plant communities. They can also be assessed at this scale for VECs that have most of the population distributed within the RSA. For species that have small to moderate breeding home ranges such as waterbirds,

songbirds, and raptors, the populations would be primarily affected by natural and human-related factors that change survival and reproduction of individuals within the RSA. Those populations should be little influenced by emigration and immigration (Berryman 2002). Developments outside of the RSA should have no or little influence on these populations during the breeding season.

### 2.1.3 Caribou Effects Study Area

The CESA assesses the potential interaction of barren-ground caribou (Qamanirjuaq and Lorillard herds) and wolf with the Mine. In the Kivalliq region, wolves likely migrate with the caribou herds, as do the wolves of the central Northwest Territories (Walton et al. 2001).

Annual and seasonal ranges for Qamanirjuaq and Lorillard herds were calculated using satellite and global positioning system collar data for caribou (courtesy of GN DoE). Based on annual and seasonal range estimates, the Lorillard Caribou Herd should not be influenced by the Mine in most years. The Lorillard Caribou Herd is a sedentary herd (non-migratory) and their traditional calving grounds are north of Chesterfield Inlet. While the Mine will not contribute to the cumulative disturbance footprint in most GN defined seasonal home ranges for the Qamanirjuaq herd, the home range of the Qamanirjuaq Caribou Herd has the potential to overlap with the Mine

The post-calving range of the Qamanirjuaq Caribou Herd was delineated using collar data from 1998 to July 2011 to produce a 95% kernel density estimate. This was modified using an 85% volume contour to create the CESA for caribou and wolf (FEIS Volume 6, Figure 6.1-3; Golder 2014a). A percent volume contour is typically used to delineate animal home ranges (Laver and Kelly 2008) and represents the boundary of the area that contains a defined percentage of the volume of a probability density distribution. The 85% volume contour would therefore contain 85% of caribou collar locations recorded during the post-calving season.

Seasonal home ranges give space use at an ecologically relevant scale and summarizing density of development at the annual home range scale would dilute the disturbance density. The complete post-calving range was modified to delineate the CESA as a conservative method for including areas around satellite positions where there were likely non-collared caribou and wolf. A larger CESA would have diluted the effect of the Mine when effects are calculated as a percentage of the range area. The GN DoE has modified their approach to delineating seasonal home ranges for caribou herds since the CESA was originally defined, and new data have been collected. The most recently defined core ranges are smaller than previously identified. As such, the CESA now encompasses the entire spring migration, calving, post-calving, and summer ranges, as well as part of the rut, fall migration, and winter ranges (M. Campbell, GN DoE, 2014, pers. comm).

Temporal scales for monitoring consider the four phases of mine development, from construction, operation, final closure and through to post-closure decommissioning.

## **2.2 Monitoring Scales**

The majority of monitoring program described below will focus on the local site-specific scale, however, Agnico Eagle has committed to larger scale monitoring through collaborative programs and financial contributions as described below.

### **2.2.1 Local Scale**

Wildlife sightings log, on-site surveillance and road surveillance monitoring will be completed to trigger mitigation actions when caribou occur near, or on-site. During periods when there is the highest potential for caribou to move through the Mine site, increased height of land surveys in areas of known historical caribou paths will be completed. A review of the terrain Digital Elevation Model will help to determine the best vantage points in and around the Mine for height of land surveys.

### **2.2.2 Regional Scale**

Agnico Eagle has committed to contribute to the GN's caribou collaring program, and receive timely location data from the GN DoE during key seasons (i.e., post-calving) to determine direction and rate of movement, particularly if portions of the herd move towards the Mine area. In previous years, this data has proven to be effective at providing information on the direction and rate of movement of caribou towards the Mine, however, it is not possible to determine the herd size from this information or whether there will be other groups moving towards the Mine sooner.

There are very few options for completing more systematic surveys to yield this type of information due to the remoteness of the area. However, Agnico Eagle implemented a remote camera program in 2020 to yield real-time data. While this program was rolled out, it still poses challenges with setup, check, and maintain cameras. The GN is also not supportive of aerial flights for the purposes of wildlife surveys as they are too disruptive to wildlife. The development of a systematic communication plan that reaches out as far as possible to the community to gather information from relevant people that may be out on the land or have access to this type of information is likely the most achievable solution for additional information on the regional distribution and abundance of wildlife.

### **2.2.3 Temporal Scale**

Temporal scales for monitoring consider the four phases of mine development, from construction, operation, final closure and through to post-closure decommissioning.

## **2.3 Valued Ecosystem Component Selection**

Valued ecosystem components (VECs) and Valued Social and Economic Components represent physical, biological, cultural, social, and economic properties of the environment that are either legally, politically, publicly, or professionally recognized as important to a particular region, community, or by society as a whole. Several wildlife VECs were selected to assess Mine-related effects on the terrestrial wildlife and wildlife habitat (FEIS Volume 6, Table 6.6-1; Golder 2014a). The only wildlife species for which concern was raised during public consultation was caribou (FEIS Volume 3, SD 3-1; Golder 2014a).

### 2.3.1 Wildlife Valued Ecosystem Component Species

The wildlife VECs selected to assess Mine-related effects on the terrestrial wildlife considered in the TEMMP are presented in Table 1. The VECs were assessed in the 2014 FEIS (Table 6.6-1; Golder 2014a).

**Table 1. Wildlife Valued Ecosystem Components**

Valued Component		Rationale for Selection
Ungulates	Barren-ground Caribou	Important subsistence, cultural, and economic species; migratory species with extensive range requirements; may be affected by disturbance during seasonal movements; primary prey species for large carnivores in northern environments. Designated as “Threatened” (COSEWIC 2016) and under consideration for Federal listing.
Carnivores	Gray Wolf	Large home range size linked to caribou migrations; top predator in ecosystem; can be attracted to human disturbance; long generation time means one individual may be affected by disturbance over multiple years resulting in potential regional population effects; important subsistence and cultural species.
	Polar Bear	Large home range size; top predator in ecosystem; can be attracted to human disturbance; long generation time means one individual may be affected by disturbance over multiple years resulting in potential regional population effects; listed as “Sensitive” in Nunavut (CESCC 2001), “Special Concern” and on Schedule 1 of SARA in Canada (COSEWIC 2013), and listed as “Vulnerable” by the IUCN (Schliebe et al. 2008).
Birds	Upland birds (including migratory birds)	Upland birds include upland migratory birds (i.e., songbirds and shorebirds) and non-migratory birds (i.e., ptarmigan). Upland birds have a small territory size so may be affected by habitat loss; migratory birds are susceptible to population declines as a result of changing environmental conditions on breeding and overwintering habitats.
	Waterbirds	Includes waterfowl, loons, and swans; waterbirds may be affected by loss of shoreline habitat for breeding; important staging habitat may also be lost; sensitive to noise disturbance and human activity; some species are important for subsistence; a number of species are listed as sensitive in NU.
	Raptors	Sensitive to noise disturbance and human activity during nesting; include peregrine falcon and short-eared owl (Federal species at risk).

### 2.3.2 Other Species Considered in the TEMMP

Grizzly bear, muskoxen, Arctic fox, and wolverine were also considered as VECs, but not selected because the core part of their distributional range does not overlap with the Meliadine Mine (GN 2011); however, monitoring data is collected and recorded as part of the TEMMP.

The distribution of muskox is changing in Nunavut, thus muskox may increase in abundance and distribution during the life of the Mine. Although not included as a VEC, future distribution was considered to guide monitoring and potential mitigation in the future.

Arctic fox was not selected as a VEC because the species is listed as secure or common by governmental agencies, and can thrive in and around human developments.

## **2.4 Baseline Summary**

The *Terrestrial Vegetation and Wildlife Baseline Synthesis Report* can be found in FEIS Volume 6, Supporting Document 6-2 (Golder 2014a). The report compiles all wildlife information collected since the mid-1990's when this property was explored by Western Mining Corporation International Ltd. (WMC) which was subsequently leased to Comaplex Minerals Corporation prior to Agnico Eagle taking over the property. The Table 2 summarizes the general abundance of several species in the Mine area based on surveys and findings reported in the baseline documents.

### **2.4.1 Background Caribou Surveys**

For baseline data collection, aerial helicopter surveys for barren-ground caribou were completed up to 2009 in the RSA. Subsequently, caribou information has been collected through collaboration with the GN DoE and Agnico Eagle contributing to collaring initiatives for the Qamanirjuaq herd. The majority of the caribou aerial surveys in the RSA and CESA were completed between 1998 and 2009 during the spring migration/calving season (i.e., March to June) and post calving through to early winter (i.e., July – November). Caribou can be abundant in the regional study area during the post-calving season, however, numbers are highly variable. Although present within and near the Mine area during the post-calving season, caribou numbers generally tend to be low, however, larger herds (i.e., a few thousand) have come through the Mine area each of the last two years and IQ information has suggested that this happens every 10-12 years. Caribou are an important species for community residents, and as such, will be a focal species in this TEMMP.

### **2.4.2 Background Arctic Fox Den Surveys**

Arctic foxes are common residents in the Mine area, and information was obtained on den sites in 2008. Den sites in support of baseline surveys have usually occurred in June when pups emerge from their dens, and again in July to determine pup survival. These dens are stratified by habitat, mainly eskers, to focus on areas with the highest potential for active dens. The last survey for fox dens was in 2009, albeit the survey was more opportunistic than focused due to a lack of helicopter availability. A total of 21 den sites were observed to be active in the Mine area in June. Arctic fox will likely be affected by the Mine because they are common and may be attracted to the Mine area.

### **2.4.3 Background Birds Surveys**

Bird baseline studies were completed for the Mine in 1998, 1999, 2000, 2008, 2009, and 2011 in the RSA. A total of 37 bird species was observed to the Mine area including:

- fourteen (14) species of waterfowl;

- five (5) species of shorebirds which are considered uncommon;
- three (3) species of raptors; and
- two (2) owl species.

Peregrine falcon and rough-legged hawks appear to be the most common raptors in and around the Mine. Raptor nest occupancy and productivity surveys have been completed as part of the wildlife baseline program. As stated earlier, Agnico Eagle is supporting raptor monitoring for the Meliadine Mine through the Arctic Raptor Project. Activities associated with the raptor monitoring are discussed below. Peregrine falcon nests have been affected by Mine-related activities (e.g., quarry) in the past and will be an important focal species in this TEMMP.

Point-count surveys (100 m radius) determined the occurrence and abundance of upland breeding birds. Program for Regional and International Shorebird Monitoring (PRISM) plots surveyed shorebird occurrence and aerial surveys determined waterbird occurrence and abundance in the RSA. Songbirds and shorebirds are not very common in the Mine area and, in general, species richness and densities are low. Although, songbirds and shorebirds will be monitored as part of the TEMMP, it is believed that there will be limited observable effects to these species as a result of the Mine, outside of habitat loss from the Mine footprint.

Ground and aerial surveys were used to locate swan and loon breeding areas and raptor nests in the RSA. The most common waterfowl present in the Mine area include Canada goose, tundra swan, long-tailed duck, and sandhill crane. Although there is no shortage of habitat for waterfowl, the Mine has the potential to affect waterfowl habitat, consequently, these species will be monitored within the TEMMP. Waterfowl eggs and feathers are important for community residents.

**Table 2. General Species Abundance based on the Wildlife Baseline Reports (Golder 2014a)**

Species	Abundance within the Mine Area
<b>Mammals</b>	
Barren-ground Caribou	The Qamanirjuaq herd is regular but transient during spring migration and calving periods
Muskox	Very uncommon
Arctic hare	Common resident
Arctic fox	Common resident
Gray wolf	Infrequently observed
Polar bear	Very uncommon
Grizzly bear	Very uncommon
<b>Birds</b>	
Pacific loon	Confirmed regular breeding summer migrants
Tundra swan	Confirmed regular breeding summer migrants
Canada goose	Common
Long-tailed duck	Common
Sandhill crane	Common
Peregrine falcon	Common, confirmed breeders
Gyr Falcon	Confirmed breeders
Rough-legged hawk	Common, confirmed breeders
Short-eared owl	Documented and nest observations indicate that they are likely breeding in the area

## 2.5 Incorporation of Inuit Qaujimajatuqangit

In 2010, Nanuk Enterprises completed additional Inuit Qaujimajatuqangit (IQ) studies for the Mine. Nanuk Enterprises sought to replicate the same methodology used for studies completed in 1997 and 1998. Many of the participants in the earlier studies were not available to participate in the studies conducted in 2010 and 2011. Of the participants named in the earlier studies, two were available to participate in the recent studies. The field studies done in 2010 and 2011 were expanded to include participants from Whale Cove, along with participants from Rankin Inlet and Chesterfield Inlet. The studies involved the participation of elders and younger adults, and a mixture of men and women.

IQ information derived from interviews was organized and documented under the following topics:

- hunting and trapping resources, including:
  - caribou;
  - terrestrial wildlife; and
  - marine mammals.

- fish resources;
- vegetation resources; and
- culturally important areas.

Agnico Eagle acknowledges that IQ is continually learnt and continues to glean IQ through various conversations related to the Meliadine Mine.

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### SECTION 3 • WILDLIFE EFFECTS MITIGATION

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The FEIS predicted that the incremental changes to the quantity, quality, and spatial distribution of habitats should not have a significant impact on the structure and function of wildlife and bird populations and communities in the ecosystem relative to natural factors occurring over the same period of time and space. The predicted magnitude of effects to wildlife and wildlife habitat and birds and bird habitat are expected to be within or slightly exceed baseline conditions and natural variation over time. Consequently, the Mine should not have a significant adverse impact on wildlife and bird population abundance and distribution, and on the continued opportunity for traditional and non-traditional use of wildlife in the region.

These predictions were made after the initial pathway analysis (i.e., analysis of effects linkages between wildlife and birds with the Mine) and determination of appropriate mitigation measures to be implemented.

Potential impacts to wildlife and wildlife habitat from the Mine are divided into three categories in the FEIS, and in this document. These categories are:

- direct habitat loss, describing the immediate loss of vegetation and other wildlife habitat from the physical Mine footprint;
- indirect habitat loss, describing the changes to habitat use that occur beyond the physical Mine footprint, from factors such as noise and dust; and
- Mine-related mortality.

All wildlife observations, mitigation measures and location of the actions will be reported by Agnico Eagle on an annual basis.

#### 3.1 General Mitigation Measures

The following are the general mitigation practices, for valid (i.e., minor or primary) pathway linkages, that will reduce the effects of the Mine on wildlife which also includes birds and wildlife habitat. The proposed mitigation measures follow a review of the best management practices (BMP) from others similar operating mines in the region, including Meadowbank Mine, Snap Lake, Ekati, Diavik, and Gahcho Kué (BHPB 2010; DDMI 2010; De Beers 2007; De Beers 2013).

The TEMMP provides the monitoring for mitigation measures specific to effects that occur within the direct physical Mine footprint and any Mine-related wildlife mortality. These include:

- mitigation measure to be implemented for landfill practices;
- use of fencing (where necessary);
- building skirts;
- employee education;
- monitoring wildlife along the AWAR; and

- monitoring raptor nesting activity.

### 3.1.1 Direct Habitat Loss

Direct effects to wildlife populations includes the physical disturbance and loss of habitat (e.g., upland, riparian vegetation, wetlands, and water), which results in the direct displacement of wildlife. Direct habitat disturbance occurs through the construction of the Mine footprint, such as the construction of roads, mine infrastructures, and increased water levels in some local lakes and streams.

BMP proposed to reduce direct habitat loss includes the following:

- Compact plant arrangement is designed to reduce the overall Mine footprint.
- Design roads as narrow as possible, while maintaining safe construction and operation practices, and meeting legislated requirements. For example, minimum haul road widths are defined under the *Mine Health and Safety Act*, SNWT (NU) 1994, c 25.
- Promote natural re-vegetation and progressive reclamation methods as the mine develops.
- Cross-drainage structures designed and constructed in such way that structures will not create a hydraulic barrier and will convey peak flows corresponding to 1:25 year 24-hour rainfall event.
- Use of staggered culvert configuration, and snow removal at the culvert inlet and outlet prior to the freshet to promote drainage during spring thaw and freshet (see FEIS Volume 2, SD 2-9).
- Regular road inspection to identify any areas where water is accumulating along the road represents a risk and installing additional culverts to alleviate the risk (see FEIS Volume 2, SD 2-9).
- Shoreline areas susceptible to extensive erosion will be addressed by appropriate erosion protection measures to reduce erosion and associated re-suspension of fine sediment.
- Adhere to the Water Management Plan.
- Discharge from dewatering of waterbodies are sampled regularly to monitor for compliance with discharge criteria, and any water not meeting the criteria will be treated or stored within the controlled Collection Ponds until it meets criteria.
- Hydraulic connections to the natural receiving environment will be re-established once water quality monitoring demonstrates that the water meets water quality guidelines for direct release without further treatment.
- Site infrastructure will be decommissioned and removed from site.
- Implement a Mine Closure and Reclamation Plan.

### 3.1.2 Sensory Disturbance

Indirect effects to wildlife are associated with changes in habitat that can alter the movement and behaviour of individuals in the vicinity of mine sites as a result of sensory disturbance. The mechanisms of indirect effects are poorly understood, but are likely related to dust, noise, human activity, and changes to vegetation communities. The following BMP are proposed to reduce indirect habitat effects

to wildlife populations (and refer to the Road Management Plan and Dust Management Plan for related measures):

- Dust will be actively suppressed from roads (water and/or other dust suppressants). Potential use of chemical dust suppressants in accordance with the Environmental Guidance for Dust Suppression published by the GN DoE.
- Enforcing speed limits will assist in reducing dust and noise generation from roads.
- Create passage ways for wildlife near waterlines and/or pipelines at pre-determined locations so it will not be a barrier to wildlife movement.
- Wildlife will be provided the right-of-way. Vehicle access will be limited when large numbers of caribou are crossing the road; this will occur in consultation with the KHTO. To reduce sensory disturbance and the possibility of vehicle collisions, traffic should cease if caribou are within 100 m of a road.
- In consultation with GN, KivIA, and KHTO, access will be controlled when caribou are present at the Mine site.
- Maximum speed limit on all site roads is 50 km/h and will be reduced to a maximum of 30 km/h when caribou or other wildlife are known to be on-site.
- When necessary, nest specific management plans for breeding peregrine falcons will be developed, which may include a 500 m no disturbance buffer. Specific scenarios are discussed below in Section 3.1.4.
- Site roads have been designed and constructed to use finer material size that facilitate caribou crossing (i.e., coarse boulders are not used).
- Minimize outside workforce when caribou herds (i.e., >50 animals) move through the Mine.
- Blasting activities will not occur when caribou herds (i.e., >50 animals) are known to be within 5 km of the Mine.
- Report wildlife carcasses observed on and in the vicinity of the site to environment staff, and along access roads, as soon as possible. Consult the GN Conservation Officer to determine appropriate course of action.
- Push the snow with a dozer when clearing the road to avoid buildup of snowbanks on the sides of the roads.
- A near-miss between a vehicle and an animal should be reported as a wildlife incident.
- Road surfaces will be maintained through grading and the addition of granular material.
- Project design will use conventional insulation, baffles, and noise suppressors on equipment.
- Stationary equipment (e.g., crushers, incinerators) will be housed inside buildings.
- Regular maintenance of equipment to limit noise.
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#### **3.1.2.1 Air Traffic Management**

An Air Traffic Management Plan has been developed (see Appendix II). All pilots of helicopter and fixed wing aircraft are requested to abide by the guidelines set forth when flying to/from the Meliadine Mine

or in the vicinity of the Mine area wherever possible (from a safety perspective). The following describes some BMPs to be implemented:

- For long-range transportation flights to and from Rankin Inlet, aircraft (fixed-wing and helicopters) are to fly at a minimum of 600 m above ground level. Exceptions may exist during takeoff and landing, low-level ceiling conditions, high winds, or other risks to flight safety.
- For relatively shorter transportation flights such as airlift for staff and equipment between camp, and ore bodies within the Meliadine lease, the aircraft are to fly at a minimum of 300 m above ground level. Exceptions may exist during takeoff and landing, low-level ceiling conditions, high winds, or other risks to flight safety.
- The Environment Department must be notified if caribou, muskox, or other animals are known to be within 5 km of the heli pad. The pilot should radio the Meliadine designated camp aircraft frequency and request that the camp radio operator call out the wildlife team to herd animals away from the strip before landing.
- At remote landing areas, helicopters are asked to not land within 1 km of individuals or herd of wildlife.
- When flying over large herd of caribou ( $\geq 50$  individuals in close proximity to one another), a 1,000 m vertical and 1,500 m horizontal distance from the herd is observed whenever possible.
- Avoid helicopter flights over known areas of active raptor nests, active waterfowl nests and shorebird staging areas during critical seasons during the spring and summer months. The Environment Department can inform pilots of these areas.
- Harassment of wildlife such as flying below 300 m, especially grizzly bear, muskox, caribou, wolf, and wolverine, is expressly forbidden. Exceptions exist only in the rare instance the animal(s) poses an immediate danger to a person in the field.
- The Iqalugaarjuup Nunanga Park is located between the Meliadine camp and Rankin Inlet. To minimize impact on the wildlife and the Park's visitors, the pilots shall avoid to flight over or to land in the vicinity of the Park.

### 3.1.3 Hazards to Wildlife from Mine Operations

Occasionally, mining operations lead to the direct injury or mortality of wildlife. This may be either accidental such as vehicle collisions with wildlife or the deliberate removal (re-location or intentionally destroyed) due to wildlife safety issue to protect workers. The most effective way to reduce the cases of wildlife mortality is to reduce the availability of food and shelter for wildlife, thus limiting the attraction and presence of animals within the Mine site. Specific BMP proposed to reduce direct Mine-related wildlife mortality includes the following:

- All employees are provided with wildlife environmental awareness training.
- The presence of wildlife within the Mine footprint will be communicated to the environment staff.

- Maximum speed limit on all site roads is 50 km/h and will be reduced to a maximum of 30 km/h when caribou or other wildlife are known to be on-site.
- To reduce sensory disturbance and the possibility of vehicle collisions, traffic should cease if caribou are within 100 m of a road.
- A near-miss between a vehicle and an animal should be reported as a wildlife incident.
- Hunting, trapping, harvesting and fishing is prohibited for employees and contractors while at work.
- The deliberate destruction or disruption of wildlife nests, eggs, dens, burrows is prohibited.
- Access to the mine site is controlled by a gate. Private vehicles (cars, trucks) are required to have a special authorization. Rules for road use within the controlled road sections are posted at the gate.
- Upon consultation with the KivIA and KHTO, 'no shooting zone' signages will be established along the road and around the Mine site (see FEIS Volume 2, SD 2-9).
- Sea-can doors will be kept closed at all times to avoid wildlife using them as a shelter.
- Consideration of a boulder field design to deter caribou from the TSF.
- All roads will be decommissioned and scarified as described in the Mine Closure and Reclamation Plan (see FEIS Volume 2, SD 2-9).
- Skirt all buildings and stairs, where possible, to the ground to limit opportunities for use as shelter by wildlife.
- Littering and feeding wildlife is prohibited.
- Conduct land clearing for all facilities outside of the nesting period of migratory birds (May 15 to September 15) for work area known to be used by nesting birds.
- Prevent upland breeding birds and raptors from nesting on mine infrastructure and man-made structures. If a nest is found and eggs are present, then the nest will be monitored and efforts will be made to avoid the area.
- Isolate or remove any physical or chemical hazards to wildlife.
- Report to the GN DoE any raptor nesting activity observed on Mine infrastructure or within 1.5 km of the Mine.
- Removal of physical hazards will be part of the Mine Closure and Reclamation Plan (see FEIS Volume 2, SD 2-17).
- Problematic wildlife will only be destroyed as a last resort, and upon approval by GN DoE.
- Contact GN DoE to receive additional direction regarding new issues that arise.
- Wildlife carcasses on or near roads will be reported and removed to minimize the attraction of predators and scavengers to roads and roadsides where they would be at an increased risk of

colliding with vehicles.

### 3.1.4 Migratory Birds Protection

Agnico Eagle will follow ECCC's recommendation that avoidance should be the primary mitigation measure to avoid the incidental take of migratory birds. In the event that vegetation clearing cannot be scheduled outside the breeding season, migratory bird nest searches areas will be completed to search for active nests within four days of destruction/clearing activities by an avian biologist or naturalist with experience with migratory birds and migratory bird behavior indicative of nesting (e.g. aggression or distraction behavior; carrying nesting material or food). Nest surveys will be carried out using accepted standard protocols. If nests containing eggs or young of migratory birds are located or discovered, all activities in the nesting area will be mitigated until nesting is completed (i.e. the young have left the vicinity of the nest). Any nest found should be protected with a buffer zone appropriate for the species and the surrounding habitat until the young have left the nest.

Agnico Eagle will incorporate, when possible, the ECCC recommendations for setback distances to minimize disturbance to known nests or nest sites identified by ECCC or the GN DoE (see Table 3 and footnotes for adjustments to setbacks for sensitive species and species at risk). As per NIRB Project Certificate 006 Condition 62, when observance of these setbacks is not feasible, AEM will develop nest-specific guidelines and procedures to ensure the bird's nests and their young are protected.

**Table 3. Bird Protection Setback Distances**

Species Group	Pedestrians /ATVs (m)	Roads / Construction / Industrial Activities (m)
Songbirds	30	100
Shorebirds	50 <sup>a</sup>	100 <sup>a</sup>
Terns/Gulls	200 <sup>b</sup>	300 <sup>b</sup>
Ducks	100	150
Geese	300	500
Swans/Loons/Cranes	500	750

<sup>a</sup> If project activities are within the breeding ranges of American Golden Plover or Ruddy Turnstone, these setbacks should be increased to 150 m for Pedestrians/ATVs and 300 m for Roads/Construction/Industrial Activities respectively. If project activities are within the breeding ranges of Black-bellied Plover, Whimbrel or Red Knot (a Species at Risk [SAR]), these setbacks should be increased to 300m for Pedestrians/ATVs and 500m for Roads/Construction/Industrial Activities. If field crew are trained in the identification of these species then these higher setbacks need only apply to these more sensitive species, and lower setbacks can be used for the remaining shorebird species. In areas where several species are nesting in proximity, setbacks for the most sensitive species should be used if they are present.

<sup>b</sup> If project activities are in proximity to breeding colonies of Ross's Gull (SAR) or Ivory Gull (SAR) these setbacks should be increased to 500m Pedestrians/ATVs and 750m for Roads/Construction/Industrial Activities.

Agnico Eagle has completed measures to deter waterbirds from using water management ponds at Meliadine, these measures primarily involve deterrents (i.e., water cannons and predator kites and decoys) and monitoring protocols. Agnico Eagle will consult with ECCC to determine if deterrent measures are required and what measures are the most appropriate, where applicable.

### 3.1.5 Management of Toxic Substances

The following mitigation will decrease the risks to wildlife from ingestion of toxic substances or encounters with toxic spills during all phases of activity on the Mine site:

- wastes associated with mechanical maintenance and repairs will be managed of per the Hazardous Materials Management Plan;
- adhere to and regularly update the Spill Contingency Plan;
- follow the procedures outlined in the Hazardous Material Management Plan;
- designate and train a spill response team consisting of on-site personnel;
- provide spill containment supplies at fuel transfer and storage areas;
- immediately isolate, clean and report any spills;
- keep spill response equipment readily available and maintained;
- maintain vehicles and equipment; and
- store fuel in double-walled containers or single-walled containers in lined containment areas.

### 3.1.6 Management of Attractants

The following policies and practices will be included in these management plans to reduce the numbers of scavenging wildlife such as carnivores and birds attracted to the Mine, and limit human-wildlife interactions:

- Most construction of the Mine will be based out of Rankin Inlet or the Meliadine camp, eliminating the need for temporary camps along the AWAR route.
- Education and reinforcement of proper waste management practices to all workers and visitors to the site.
- Education on the risk associated with feeding wildlife and careless disposal of food wastes and liquids, such as coffee and juices.
- Ongoing review of the efficiency of the waste management program and improvement through adaptive management.
- Kitchen garbage and waste from dormitories and offices will be incinerated on a daily basis to limit attractions to wildlife.
- Adhering to the Landfill and Waste Management Plan.
- Staff working outdoors will be provided designated indoor areas for lunch and coffee breaks.
- Waste facilities and incinerators will be enclosed.
- Hazardous material will be shipped off site for recycling or disposal at an appropriate facility.
- The landfill will be inspected and covered progressively.

- Waste products that cannot be incinerated or landfilled will be collected, sorted, and placed in designated areas within the Waste Management Area until they can be shipped off site.
- BMP for deterring waterfowl and waterbirds from using areas nearby mining operations (e.g. use of propane cannons).
- All small temporary storage containers (e.g., garbage cans) for garbage and recycling are wildlife protective features (i.e. have bear proof lids).
- All buildings and containers (e.g., sea cans) large enough to harbour any wildlife species will always have their doors shut when not being used by personnel to prevent wildlife from entering.
- Skirt all buildings and stairs, if required, to the ground to limit opportunities for use as shelter by wildlife.
- Wildlife surveillance monitoring will detect use of Mine infrastructure, including waste disposal infrastructure (e.g., landfill and incinerator, among others) by wildlife as an attractant, for nesting or shelter.
- Develop an internal environmental working group to improve waste management protocols at Meliadine.

### 3.1.7 Deterring Wildlife

The goal of wildlife deterrent action is to respond to situations using humane methods that keep both humans and wildlife safe. All deterrent actions start with the least intrusive method, and then increase in intensity. Each deterrent action will stop as soon as the animal moves away from the potentially hazardous site or activity or no longer poses a threat to humans. Deterrents may be used to remove wildlife from roads and potentially hazardous sites and activities. The intensity of the deterrent practice should increase only if previous steps are unsuccessful, and if warranted by the risk to staff or wildlife. All deterrent actions will be documented.

Wildlife deterrent actions will be performed only by designated individuals (such as the environmental monitors or security staff). Training for these individuals will include the following information:

- basic wildlife ecology and behaviour;
- prevention of wildlife-human encounters;
- contingencies for wildlife-human encounters;
- proper use of deterrents (such as bear bangers and firearms); and
- documenting and reporting any deterrent actions undertaken.

For deterrent actions to be successful there must be:

- knowledgeable, trained personnel who will select deterrent actions based on each situation;
- consistent application of deterrents;

- evaluation of the success of each deterrent action;
- documenting and reporting of deterrent actions to inform other staff, communities and regulatory agencies;
- effective implementation of the Landfill Management Plan, Incinerator Management Plan, and Landfarm Management Plan, particularly as it relates to the disposal of food waste; and
- absence of food, shelter, or other rewards for wildlife within the Mine site.

### 3.1.8 Caribou Protection

It is anticipated that caribou will interact with the Mine seasonally, throughout construction, operations, and closure. Baseline studies indicate that caribou will encounter the Mine during the post-calving migration and rut, approximately from mid-July through November. However, large numbers (i.e., >500 individuals) typically interact directly with the Mine site for 1-2 weeks in early July, and are generally not frequently observed outside of this time frame. Groups are primarily cows and cows with calves, and therefore have a high priority for protection from harassment and sensory disturbance. Occasionally, actions may be required to move caribou away from areas where they may be at risk. The appropriate level of action for a situation is one that removes the risk with the least disturbance to the caribou. The decision to use deterrent actions for caribou should consider the number of animals, and the potential for risk to caribou and human safety. The following policies, practices, and procedures are specifically related to caribou protection (see Appendix II and III for further details).

- site roads have been designed and constructed to use finer material size that facilitate caribou crossing (i.e., coarse boulders are not used);
- if caribou are crossing Mine roads, traffic will stop and wait for them to cross (i.e., caribou have the right-of-way);
- feeding wildlife is prohibited at all times on or in the vicinity of the mine site, including during travel to and from the mine site;
- harassment of wildlife defined as to kill, injure, seize, capture or trap, pursue and includes to stalk, track, search for, lie in wait for, or shoot at – for any of these purposes not authorized by the GN DoE) is prohibited at all times on or in the vicinity of the mine site, including during travel to and from the site;
- obey all traffic signs;
- verbally report wildlife observations (by radio or telephone to the environment staff), including carcasses, observed on and in the vicinity of the mine site and along access roads, as soon as possible;
- all incidents involving interactions, deterrents or injury of caribou will be documented and evaluated by environment staff;
- all sightings of caribou will be reported to environment staff; and

- caribou will only be moved away from roads in specific circumstances, such as when there is an emergency.

Caribou are only exposed to hazards from the mine when they are within hundreds of metres of the mine, however, the zone of influence of the mine on caribou distribution and abundance may be kilometres from the Mine. It is the areas within the immediate vicinity of the Mine and the Mine infrastructure itself where collisions or exposure to contaminants or other hazards may occur.

As stated above, wildlife have the right-of-way, therefore one caribou on or immediately adjacent to, the AWAR or in the Mine site will warrant radio alert, yielding to the animal (i.e. traffic stoppages) and/or actions appropriate to ensure the safety of the caribou and personnel depending on the location of the caribou. Agnico Eagle will implement the work suspension protocol when 50 or more caribou are observed moving in the direction of the activities and cross the 5 km setback from site activities. Observations of 50 or more caribou immediately adjacent to, or on the AWAR and/or the Mine site will warrant traffic signs, radio alerts and traffic/work stoppages (e.g., suspension of flights, drilling operations, and circulation of vehicles) depending on where the animals are occurring, until the animals leave the area.

Agnico Eagle has developed a caribou decision tree for mitigating project operation effects to caribou. Further engagement with the KHTO, KivIA, SDFN/NDFN, and GN to refine the specifics (e.g., the frequency of AWAR road surveys when caribou in specified group sizes are observed within specified distances of the AWAR) will occur.

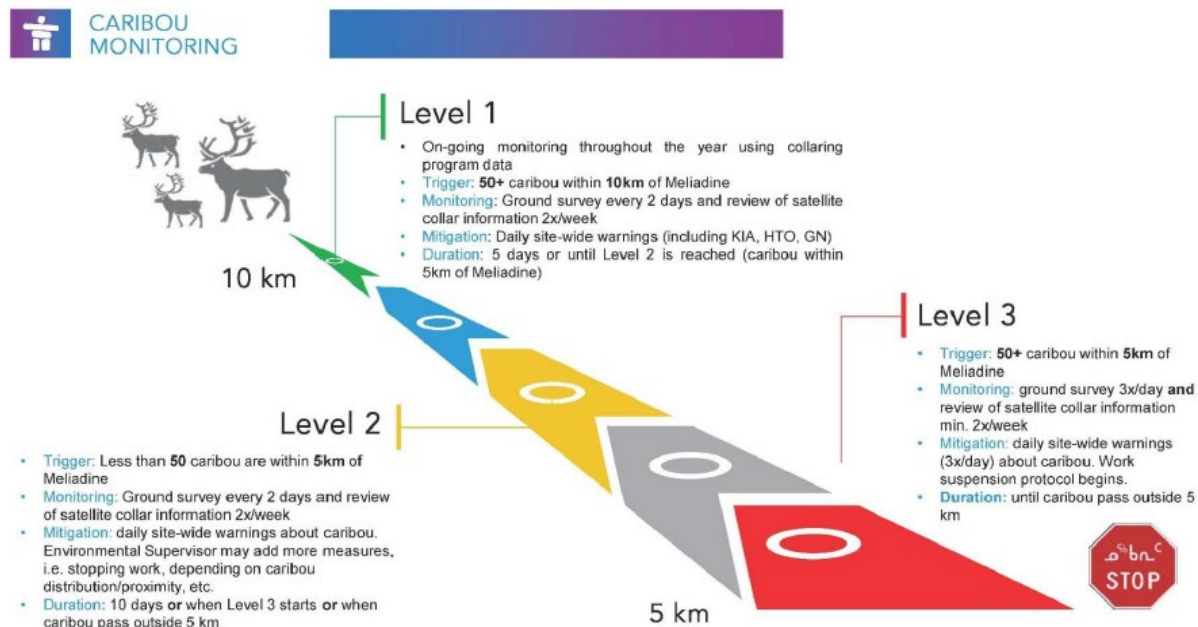


Figure 3: Decision Tree for Mitigating Project Operation

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## SECTION 4 • WILDLIFE AND WILDLIFE HABITAT MONITORING

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### 4.1 Monitoring Approach

The general approach of the wildlife monitoring program is to monitor wildlife at both the local and regional scales during all phases of the Mine (i.e., construction, operations, closure, and post-closure). Monitoring may include presence/absence, relative abundance, movement, interactions with mine operations, and use of the Mine area by wildlife. Objectives of the wildlife and wildlife habitat monitoring are the same as those for the TEMMP, outlined in Section 1.2.

Effectiveness of mitigation is uncertain. Consequently, the monitoring program attempts to understand the efficacy of these mitigation practices and also attempts to validate impact predictions. Based on information gained from the monitoring program, additional mitigation can be implemented, where necessary.

#### 4.1.1 Caribou Monitoring Approach

The distribution and abundance of caribou within and around the Mine site will be determined through data collected from the following programs:

- ***Collared Caribou Information*** – weekly to bi-weekly updates from the GN.
- ***AWAR Road Surveillance*** – completed on an ongoing basis by all mine staff using the AWAR; wildlife sightings are immediately communicated to radio dispatch and recorded.
- ***AWAR Wildlife Surveys*** - completed weekly, or more frequently when necessary (e.g., large herds of caribou in the immediate vicinity of the Mine).
- ***Regional Wildlife Communication Plan*** – a plan will be developed whereby a weekly communication check will be completed with individuals who may be out on the land or know of individuals out on the land in the regional area of the Mine to check for information regarding wildlife distribution and abundance. These individuals may be helicopter and airline pilots in the vicinity of the Mine, KHTO members, GN Conservation Officer and others. This plan will be developed with the KHTO, KivIA and Agnico Eagle.
- ***Site Surveillance Monitoring*** – completed weekly, or more frequently when necessary.
- ***Sightings Log*** – completed by all mine staff and contractors on a daily basis.

### 4.2 Action Thresholds

The following action thresholds are suggested as a starting point for adaptive management and TEMMP refinement:

- Direct habitat loss (describing the immediate loss of vegetation and other wildlife habitat from the physical Mine footprint): Monitored through vegetation monitoring. The threshold will be an expansion of the Mine footprint beyond the area described in the FEIS and permitted by NIRB.
- Indirect habitat loss (describing the changes to habitat use that occur beyond the physical Mine footprint, from factors such as noise and dust): Thresholds for indirect habitat loss are difficult to

define, particularly as methods for indirect habitat loss have not yet been finalized, but typically include attempts to detect attraction to or avoidance of the area surrounding the mine (the zone of influence). A threshold of no more than 10% deflection of caribou groups has been suggested as a possible measure of indirect habitat loss.

- Mine-related mortality: The mortality of a single caribou or Arctic fox will trigger an incident investigation. The investigation should consider the causes and suggest mitigation (including monitoring, training, environmental design features or changes in policy or procedure).

#### 4.2.1 Action Thresholds for Caribou

Results from baseline surveys indicate that caribou and recently muskoxen are present in the Mine area throughout the year, but caribou are observed in greatest abundance between May and September.

The baseline study established a map of historical wildlife presence in the region of the Meliadine Mine, including historical migration routes for the caribou. This map is shown in Figure 4.

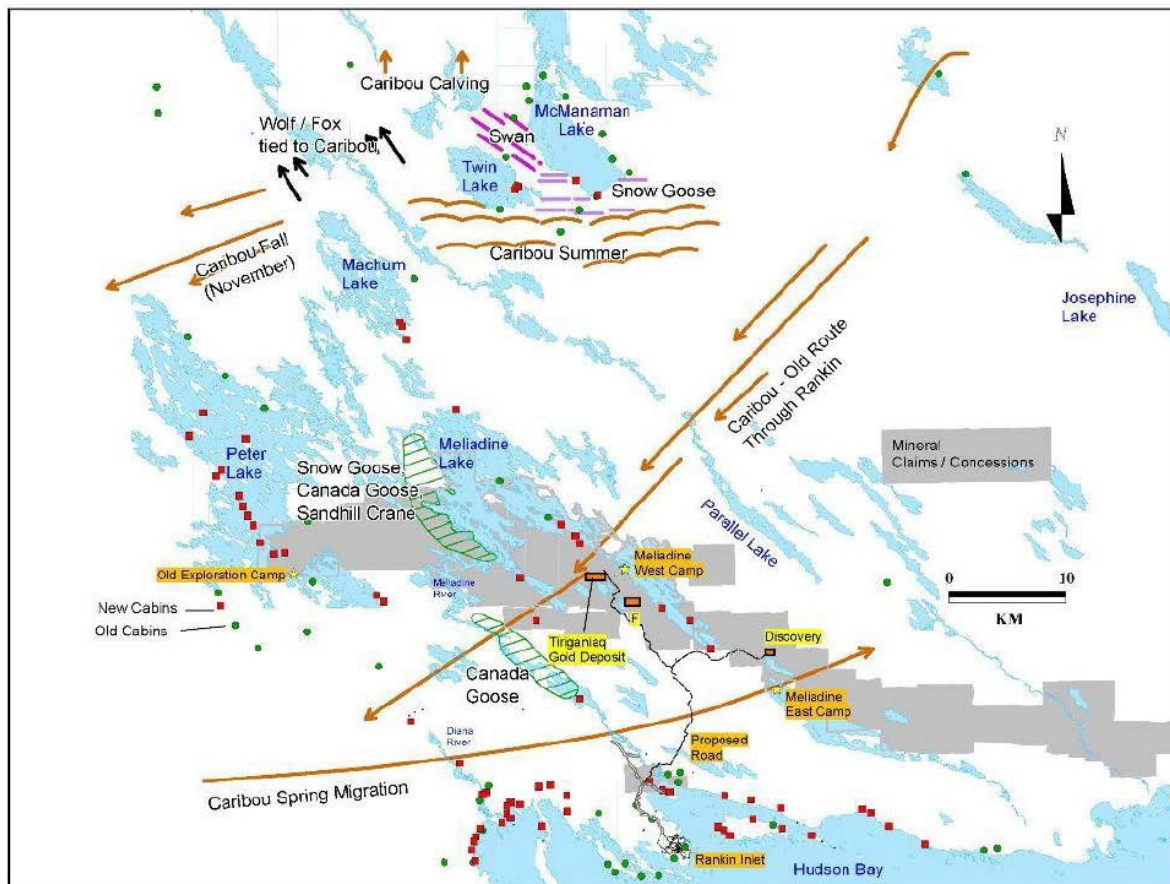


Figure 4: Map of Historical Caribou Movements through the Mine Area

The Caribou Migration Protocol includes 4 components:

- A far-field caribou herd monitoring during the migration season;
- A caribou and muskox herd sighting and protection protocol;
- An activity shutdown protocol including crew change and helicopter flight conditions; and
- An activity restart protocol.

#### **4.2.2.1 Caribou Monitoring during the Migration Season**

Caribou migrations typically occur in the Mine area in late June to early July with herds of 1,000 to 5,000 individuals migrating through the Mine for a period of 3 to 7 days. The caribou can therefore be present around the site during this small window of their annual life cycle with small isolated and less frequent groups during the post-calving season.

During this period Agnico Eagle will report any sightings and prevent human activities that could disturb the herd. Caribou will have the right-of-way and will not be blocked or deterred from moving through the Mine area.

Agnico Eagle must take all possible measures to avoid disturbance to the caribou or muskox herds. At all times, it is strictly forbidden to harass wildlife. This includes persistently worrying, chasing, or disturbing herd or individuals.

#### **4.2.2.2 When Observing Herds of Caribou or Muskox**

The protocol has been established for on-site workers and contractors to immediately report the presence of herds of caribou (50 or more) or muskox (10 or more) to the Meliadine Environmental Department which will immediately contact the KivIA, KHTO and GN. When reporting the presence of these species, the location and estimated numbers will be provided.

#### **4.2.2.3 When to Activate the Work Suspension Protocol**

During migration of Muskox (10 or more animals) or Caribou (50 or more animals) herds Agnico Eagle must start implementing the work suspension protocol when the caribou herd is moving in the direction of the activities and crosses the approximate 5 km mark from the site activities (the activities include the road construction, drilling, camp operation, etc.).

#### **4.2.2.4 Work Suspension Protocol**

Work that could interfere with the caribou herd migration will be suspended as follows (see Appendix III for additional details):

- helicopter flight;
- drill operation; and
- circulation of vehicles.

Upon activation of the work suspension protocol, the following steps will be taken:

- Inform all employees at the drill sites that are in the direction of the caribou migration that they

will need to shut down their operation so that these operations are down before the caribou herd reaches the 3 km<sup>2</sup> boundary.

- Remove drill rods from the holes and secure the drill station.
- Organize transport of the affected personnel to the camp. Personnel that do not require air transportation will be requested to walk back.
- During helicopter evacuation of personnel the Air Traffic Management Plan (see Appendix III) will be applied to protect the caribou herd (avoidance distance of 1,000 m vertical and 1,500 m horizontal). Use of helicopter for emergency evacuation of personnel for medical reason will still be allowed.

#### 4.2.2.5 Road Traffic

When a herd of caribou ( $\geq 50$  individuals) or muskoxen ( $\geq 10$  individuals) is within 100 m from a road:

- Vehicle traffic will be suspended;
- Wildlife will have the right of the way; and
- Vehicles must wait without disturbing their movements until the herd is 100 m away from the road.

#### 4.2.2.6 Restarting Activities Protocol

Through ground-based monitoring, the Agnico Eagle wildlife monitors will determine when caribou are outside the 3 km<sup>2</sup> buffer and report the information to the Meliadine Site Manager or designate. The observations will also be shared with the KivIA, GN, and KHTO by email.

Activities can resume if:

- caribou are outside the 5 km setback;

or if:

- caribou herd is outside the 3 km<sup>2</sup> area for more than 2 days; and
- an agreement is reached between the KivIA, GN, and KHTO to resume activities.

The decision and time to resume activities will be communicated to the KivIA, GN, and KHTO by email.

### 4.3 Wildlife Sightings Log and Road Surveillance Monitoring

The general Mine site wildlife sighting log and road surveillance monitoring is designed to determine the frequency and distribution of wildlife interactions with the Mine site infrastructure and the AWAR (see Roads Management Plan). Results from these surveys will be used to verify impact predictions and will focus on areas that have the highest potential to cause mortality (i.e., haul roads, AWAR, WRSFs, TSF) or lead to mortality (i.e., waste management and landfill areas, camp). This component of the monitoring program will build from Agnico Eagle's experiences and protocols developed for the Meadowbank Project (Nunavut Environmental Consulting 2012). The wildlife sightings log component is not completed systematically but does contain repeated observations, deterrence activities, monitoring location and

mitigation that will provide an indication to Agnico Eagle environment staff of the potential for wildlife incidents or other trends in wildlife presence.

Road surveillance monitoring that will extend to the Mine site, will be completed systematically as described below. The Roads Management Plan for the Mine addresses specific measures related to traffic management, road access, road safety and wildlife management measures (see the Roads Management Plan).

#### **4.3.1 Target Species**

Target species for these surveys include all VEC species and other wildlife observed. Particularly, this portion of the program is designed to inform Agnico Eagle when and where wildlife are most likely to interact with the Mine and what species are most common. This will help to inform any future changes to Agnico Eagle's Wildlife Protection and Response Plan (Appendix III).

#### **4.3.2 Objectives**

The primary objectives of these general Mine site and road inspections are to record the presence of wildlife and/or wildlife signs (e.g., tracks, nesting) in relation to the Mine infrastructure. Of particular importance is the frequency of wildlife entering the Mine infrastructure areas and along the AWAR corridor. This information can then be used to determine any areas of attraction to wildlife, document human-wildlife conflicts, areas/timing of wildlife mortality or potential mortality; seasonal trends of wildlife occurrence in the Mine area, and effectiveness of mitigation (e.g., waste management and landfill).

#### **4.3.3 Monitoring Approach**

##### **4.3.3.1 Wildlife Sightings Log**

These surveys will be completed by Agnico Eagle's environmental staff during all phases of the Mine. Inspections of specific areas will have area-specific frequencies based on the potential to cause harm to wildlife or the potential for human-wildlife interactions. For example, TSF, haul roads, the AWAR, and RIBR will have more frequent inspections than waste rock piles.

Information recorded for each wildlife observation and/or signs will include:

- species;
- number of individuals;
- other characteristics such as sex or age (if readily discernible);
- details on any wildlife signs observed;
- location;
- date;
- site-specific comments.

Where animals are sighted in close proximity to roads and a risk of collision with vehicles is possible, the environmental monitors or site personnel using the area will report the number of animals, location, and direction of travel to the mine radio dispatcher who will inform all vehicle operators.

This program will include a wildlife awareness poster posted at key locations (e.g., kitchen, orientation center) and sightings cards that workers will be encouraged to take with them each day to record any incidental observations of wildlife.

#### **4.3.3.2 AWAR Road Surveillance**

This surveillance will be completed by all Agnico Eagle staff travelling along the AWAR and RIBR to the Mine site during all phases of the Mine on an ongoing basis..

If wildlife is sighted by the driver or passenger, the driver will communicate wildlife observations that will include:

- species;
- approximate number of individuals;
- approximate kilometer location; and
- any site-specific comments.

This will complement the wildlife sighting logs and the information will be collected by the road radio dispatcher who will inform all vehicle operators along the road. This program will include a wildlife awareness poster posted at key locations (e.g., kitchen, orientation center) and will encourage active participation for all employees using the road.

#### **4.3.3.3 Roads Surveillance**

Agnico Eagle in collaboration with KHTO in Rankin Inlet will carry out wildlife surveys along the AWAR and RIBR. Surveys will be conducted by two people scanning both sides of the road (to a maximum horizontal distance of approximately 1 km from the road edge) travelling at a maximum speed of 30 km/hr. Information collected from this program will be the same as per the sightings log and will include species, sex, age, location, distance from the road, date and any other relevant comments.

#### **4.3.3.4 Drone Surveillance**

It is recognized that site level monitoring is limited to the sightability and detection of caribou from the survey locations. Consequently, the determination of sightability and detection functions will be attempted for the various monitoring methods (e.g., road scan surveys). In attempts to validate observer counts, the use of drones or other unmanned aerial vehicles (UAV) could be considered. The methods used to determine sightability and detection will be determined in collaboration with the TAG.

Data from these programs will be summarized and presented annually in the overall wildlife monitoring summary report.

#### 4.4 Site Surveillance Monitoring

Wildlife is expected to be present near the Mine throughout construction, operation and closure. Site surveillance monitoring is intended to provide timely and continual information of wildlife activities at the Mine. This type of monitoring will provide direct feedback to Mine operations regarding the effectiveness of waste management and wildlife mitigation practices. Examples of wildlife activities that will be documented through the surveillance monitoring include:

- the presence of wildlife in areas where food may be available;
- the use of buildings for shelter or nesting; and
- the use of water management ponds by waterfowl.

##### 4.4.1 Target Species

Target species for these surveys include terrestrial mammals, such as caribou, Arctic fox, wolf, among other less frequently observed species (e.g., muskoxen and polar bear) and birds including raptors, waterfowl, shorebirds, and songbirds. Particularly, this portion of the program is designed to inform Agnico Eagle when and where wildlife are most likely to interact with the Mine and what species are most common. This will help to inform any future changes to Agnico Eagle's Wildlife Protection and Response Plan (Appendix III).

##### 4.4.2 Objectives and Thresholds

Through systematically recording the presence of all wildlife within and around the Mine footprint, Environmental staff will remain apprised of current and emerging issues and will be able to manage issues as they arise. To use a common example, surveillance monitoring may detect that wildlife has gained access and is taking shelter beneath a building. The common mitigation is to block the access through improved skirting, and follow-up surveillance monitoring will confirm whether the mitigation was successful, or if further action is required.

Monitoring thresholds are not well established, however, Agnico Eagle will work with the GN DoE and ECCC to better refine these thresholds and adapt their practices, nevertheless, the following thresholds are suggested as a starting point for adaptive management and TEMMP refinement:

- Mine-related Mortality – no more than 1 caribou, 20 Arctic foxes, 1 waterfowl and 1 upland bird, per year.
- Vehicle Collisions – no more than 1 caribou/year.
- Caribou movement – no more than 10% deflection (as described above) of caribou approaching roads and infrastructure.

##### 4.4.3 Monitoring Approach

Agnico Eagle's environmental staff will undertake systematic tours of the Mine site and record all wildlife observations or recent wildlife sign (e.g., tracks, scat, nesting, denning, etc.). The survey will be completed on foot and by truck. The staff will record the area surveyed and the nature and location of all

observations. This will build upon information gathered as part of the AWAR monitoring. The Site Surveillance Monitoring Survey will include all areas of the Mine site, but will focus on areas where there is greater risk such as:

- presence of wildlife attractants (i.e., accommodations, kitchen, truck shop, waste transfer area, incinerator, etc.);
- presence of potential habitat by using the Mine infrastructure for shelter, denning or nesting; or
- where people are working outdoors.

Pre-construction surveys (i.e., seasonally relevant) will be completed prior to any construction activities to determine presence of denning sites (e.g., Arctic foxes, bears or wolverines), nesting sites or other areas of high wildlife use. This will include Mine such as the waterlines and the AWAR. Depending on the findings, appropriate mitigation and/or management options will be discussed with GN staff.

Agnico Eagle is also considering the placement of remote cameras to monitor areas of high potential wildlife attraction (e.g., kitchen area, waste management areas) to determine the level of wildlife activity and assess further mitigation options.

Site surveillance monitoring will occur systematically at least once per week, or more as necessary. Monitoring will be continuous throughout all phases of the Mine. Pre-construction surveys will be completed prior to any construction activities.

Environmental staff may at any time suggest or undertake improvements to environmental design features, mitigation and management practices and policies, the need for additional training for staff, or other improvements to mitigation identified by the surveillance monitoring, as required. Investigation and reporting of incidents will be completed as they occur.

#### **4.5 Caribou Behavior Monitoring**

Caribou behaviour is known to be affected by mining and other anthropogenic activity (Curlato and Murphy 1986, Nellemann and Cameron 1996; Bradshaw, Boutin, and Hebert 1997; Webster 1997, Calef et al. 1976, Horejsi 1981, Tyler 1991, Reimers, Eftestøl, and Colman 2003), and such changes have also been documented at mining operations in the range of barren-ground caribou (ERM Rescan 2014, Golder 2004, Golder 2014b).

These behaviour changes may be expressed in two ways: changes to activity budgets, and changes to distribution. As examples of changes in activity budgets, ERM Rescan (2014) documented that the alert behaviours displayed by caribou in response to stressors lasted 35 seconds for bulls, 16 seconds for cows, while Golder (2004) documented a weak trend of reduced foraging time for cows with calves within 5 km of the Ekati. As an example of a change in distribution, Boulanger et al. (2012) identified a 14 km or 11 km zone of influence (ZOI) around the Ekati-Diavik complex, depending on whether they analyzed the aerial survey data or the data based on satellite-collar locations. Each year, however, thousands of caribou are observed in close proximity to the mine sites, grazing for long periods of time on the tundra, walking

through the sites, or migrating along routes immediately adjacent to mine infrastructure (Rescan 2012b, 2013b).

As part of compliance monitoring for the Ekati Diamond Mine and Diavik Diamond Mines Inc., behaviour monitoring programs have been undertaken cooperatively to evaluate the type and magnitude of caribou response to the presence and operation of these mines. Between October 2011 and November 2013, the Ekati Diamond Mine conducted a total of 62 focal watches (on 62 unique individuals) and 175 group scans during which one or more stressor events occurred and for which all the essential data (e.g., stressor type and occurrence time) were recorded. Behaviour monitoring along an active winter haul road was also undertaken by De Beers in early 2014 (Golder 2014b). The monitoring undertaken to date at Ekati, Diavik and Snap Lake indicates the following conclusions regarding the effect of mining activity on the behaviour of barren-ground caribou.

- Group behaviour near mines is dominated by bedding, feeding and walking behaviours and caribou continue to be present near mines, requiring protocols to manage caribou that directly interact with the mine.
- Group behaviour is more affected by natural factors such as weather, biting insect abundance, season and year than by anthropogenic disturbance. There were some years when a behavioural change was detected near the mine, but the change is subtle and not always detectable.
- Caribou respond to stressors such as trucks, aircraft and people. Where documented, the response to anthropogenic stressors is less than the response to wolves.
- Stressors rarely occurred beyond 2 km from the mine. Behavioural changes were not detected more than 5 km from the mine.
- There have been difficulties collecting sufficient data for analysis, because behavioural studies are only practical when there are large numbers of caribou present in the study area, and because large amounts of data are required to detect mine-related effects.
- It is unclear what mechanism or combination of mechanisms from stressors cause behaviour and distribution changes. Possibilities include noise, sound, dust, observation of activity, vibration, odours, or memory of previous encounters near mines. Methods to determining the relative contribution of each of these mechanisms to the caribou reaction have not yet been described, and this knowledge gap places limitations on our understanding of how to best mitigate impacts.

#### 4.5.1 Objectives

The objectives of the monitoring are:

- To determine if caribou activity budgets change with distance from the mine, and to document caribou response to stressors.
- To determine if caribou distribution changes with proximity to the mine (i.e. do caribou avoid the mine).

Caribou behaviour monitoring will be implemented when caribou presence in the RSA is increasing. This will be determined by review of caribou collar data provided by the GN. An increase in caribou groups observed during surveillance monitoring or as incidental reports of caribou groups become more common.

#### 4.5.2 Activity Budget Methods

Two different, but complementary approaches are implemented for Meliadine Mine: focal surveys and scan surveys.

- Focal surveys of a single animal are ideal for obtaining information on activity budgets (i.e., the proportion of time an animal is engaged in different behaviours), the temporal sequence of behaviours relative to stressors or other stimuli, the behaviour of an animal interacting with infrastructure (e.g., road crossing interaction and response) and the length of time it takes the animal to return to a non-stressed state following a stressor event.
- Scan samples of a group of animals are more useful for quantifying the frequencies of dominant behaviours in a group over a period of time, which can be thought of as an activity budget for the entire group.

Observations will be completed primarily during the post-calving migration, as this is when caribou are travelling with calves and they have historically been most abundant. For each group of caribou, the location, group age and gender composition, and habitat will be recorded. Ground observations will focus on determining the proportion of time caribou spend bedded, feeding, standing, alert, walking, trotting and running. The behaviour of caribou groups will be recorded at eight-minute intervals for a minimum of four and a maximum of eight observations per group.

Focal and scan surveys can be undertaken simultaneously on a group of caribou, and on a specific individual within the group. In addition to these methods, all stressors (such as vehicles, aircraft, people) are recorded and the caribou response to these stressors is documented.

Studies to date have shown that caribou activity budgets are more affected by factors such as weather and biting insect abundance than by mining activity. Activity budget monitoring therefore should be undertaken by at least two teams, preferably working simultaneously and at a distance from the Mine to provide data from treatment and control groups under similar environmental conditions. Further, experience to date has indicated that a lot of data is required to discern effects, so observers must become proficient at undertaking multiple focal and scanning surveys simultaneously, and place themselves in areas where they have the best opportunity to do so.

Discussions on potential future studies tied to adaptive management will be continued, particularly with the GN, KivIA, SDFN/NDFN, and KHTO, as appropriate and per any recommendations included in annual reporting.

#### **4.6 Vegetation and Wildlife Habitat**

The vegetation monitoring component outlines the means by which Agnico Eagle plans to reduce Mine-related effects to plant populations and communities and includes both environmental and follow-up monitoring. Environmental monitoring programs are used to track conditions and implement further mitigation as required, while follow-up monitoring is used to verify the accuracy of impact predictions and adaptively manage and implement further mitigation as required.

##### **4.6.1 Objectives and Thresholds**

The objectives of the vegetation monitoring and management component are as follows:

- measure direct loss of plant communities as a result of the Mine footprint;
- measure degree of re-vegetation of disturbed areas;
- measure distribution and abundance of non-native invasive plant species; and
- measure plant health as part of the dust monitoring program.

Specific thresholds for vegetation and wildlife habitat monitoring include the following:

- direct habitat loss measures must stay within impact predictions (i.e., 2,039 ha of terrestrial habitat loss);
- areas deemed to be re-vegetated will all show signs of natural vegetation encroachment, otherwise additional BMP may be necessary;
- no non-native invasive species will occur as a result of mining operations (i.e., new equipment or materials arrival); and
- no effects to plant health as a result of dust deposition will occur.

##### **4.6.2 Monitoring Approach**

As part of the re-vegetation monitoring plan in collaboration with the University of Saskatchewan, studies will be carried out at selected test plots to assess natural re-vegetation processes in disturbed areas. The focus of these test plots will be to evaluate plant species ingress, growth and survival on various disturbed sites, including rock fill covers, to determine re-vegetation success and the length of time it takes to re-establish vegetation on these sites. Information on which plant species are becoming established on these sites and associated percent covers will be recorded, along with site photographs to document re-vegetation progress. Additional details on methods are described in the annual reports prepared by the University and included in overall annual reporting for the Mine.

In addition, monitoring programs for non-native invasive plant species will be completed during the construction and operations phase of the Mine. Surveys for non-native invasive plant species will be

undertaken in disturbed areas (e.g., active mine site, borrow pits) to identify and document the extent of any non-native invasive plant species that may occur during construction and operations (see Figure 4). The early detection of non-native invasive plant species is important, as preventing these species from becoming established is the most effective mitigation that can be employed. If non-native invasive plant species are identified in the Mine area, they will be reported to the GN, as per DoE guidelines. As part of the reporting process, the following information will be collected and sent to the GN DoE:

- location of the species (i.e., GPS coordinates);
- species identification and population extent; and
- photographs of the species in question to confirm identification.

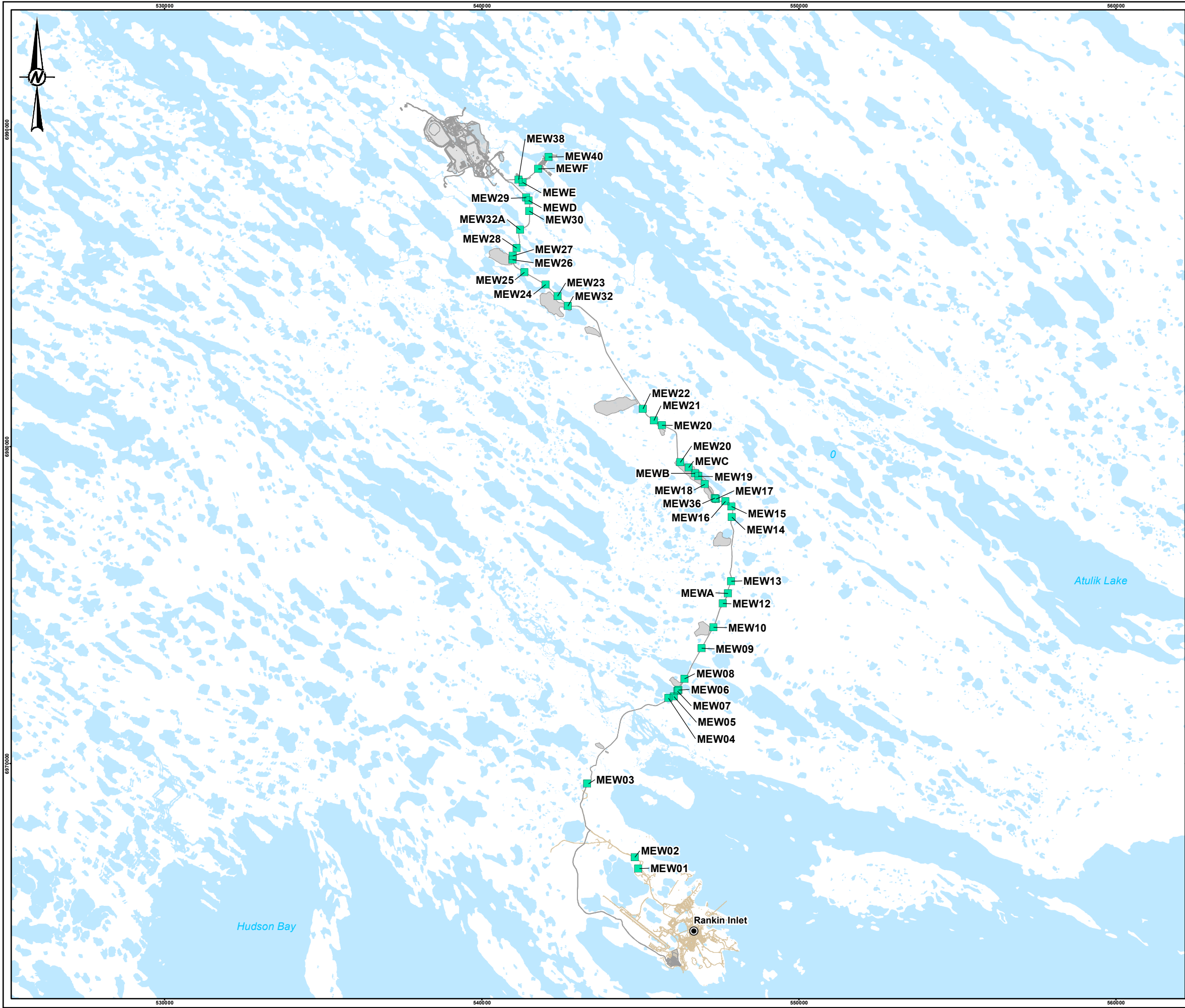
Additionally, Agnico Eagle completed sampling to determine baseline levels for metals in soils found in areas with berry-producing plants in 2017, and an on-going monitoring program to assess the health of vegetation near Project areas is being implemented. Details of the program are provided in Appendix IV.

#### **4.6.3 Vegetation Health Program**

The Vegetation Health Program incorporates a number of BMP to mitigate the effects of the Mine on plant populations and communities. These include the following:

- where possible, limit the size of the footprint area (thus limiting the extent of disturbance) and optimize the placement of infrastructure (e.g., avoiding sensitive ecosystems and plants);
- promote natural re-vegetation of disturbed areas;
- follow GN DoE guidelines regarding non-native invasive plant species and incorporate protocols for monitoring non-native invasive plant species;
- use of design features (i.e., dams, drainages, dykes, and diversions) to reduce changes to local flows, drainage patterns, and drainage areas; and
- implement the Risk Management and Emergency Response Plan, Spill Contingency Plan, and Hazardous Materials Management Plan, specifically as it relates to spills and releases.

R:\TH\Yibumaby\CAD-GIS\Client\Agnico\_Eagle\_Mines\_Ltd\Meliadine\_Gold\_Project\03\_PROJ\CTS\19122039\3000\3550\02\_PRODUCT\CDN\WCD\Report\19122039\_3000\_3550\_01\_2019\_Non\_Native\_Plant\_Specs.mxd PRINTED ON: 2020-01-21 AT: 10:29:34 AM



**LEGEND**

- NON-NATIVE PLANT MONITORING LOCATIONS
- MINE INFRASTRUCTURE
- MINE FOOTPRINT
- ALL-WEATHER ACCESS ROAD (AWAR)
- RANKIN INLET
- WATERCOURSE
- WATERBODY

0 3 6  
1:120,000 KILOMETRES

**NOTES(S)**

1. TSF, WRSF1, WRSF2, CP1 ARE THE MAXIMUM EXTENT UNDER THE APPROVED MINE PLAN AND DO NOT REPRESENT SIZE IN 2018.
2. BORROW PIT B1A IS EXCLUDED AND IS NOT ILLUSTRATED IN THE CURRENT FOOTPRINT.
3. THE PROPOSED MINE PLAN INCLUDES TIRIGANIAQ PIT 1, TIRIGANIAQ PIT 2, AND WASTE ROCK STORAGE FACILITY 3 (WRSF3) AND ASSOCIATED INFRASTRUCTURE; THESE ITEMS HAVE NOT BEEN CONSTRUCTED YET (AS OF THE END OF 2018) AND THEREFORE WERE NOT INCLUDED ON THIS MAP.

**REFERENCE(S)**

1. BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. DATUM: NAD83 PROJECTION UTM ZONE 15

CLIENT

AGNICO EAGLE MINES LIMITED

**AGNICO EAGLE**

PROJECT  
MELIADINE GOLD PROJECT  
NUNAVUT

TITLE  
**NON-NATIVE PLANT MONITORING LOCATIONS**

CONSULTANT	YYYY-MM-DD	2020-01-21
	DESIGNED	AZ
	PREPARED	CDB
	REVIEWED	CLT
	APPROVED	CLT

PROJECT NO.	CONTROL	REV.	FIGURE
19122039	3000/3550	0	4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

## **4.7 Caribou Collaring Program**

Agnico Eagle has committed to supporting the GN's caribou satellite-collaring program for the Qamanirjuaq herd. Agnico Eagle is currently supporting a similar program as part of their Meadowbank Project for the Beverly and Qamanirjuaq herds. This component of the program will be an extension of Agnico Eagle's existing commitments and contributions. This is based on having an agreed Data Sharing Agreement that meets the needs for the associated Term and Condition.

### **4.7.1 Target Species**

The target species for this component of the program is the Qamanirjuaq caribou herd, and secondarily the Lorillard herd, that has the potential for seasonal interaction with the Mine LSA, RSA, and CESA.

### **4.7.2 Objectives and Thresholds**

The objectives of this program are to provide information on the distribution, relative abundance, and seasonality of caribou occurring within the Mine LSA, RSA, and CESA in a real-time fashion as collar information is delivered to the GN DoE and shared with Agnico Eagle. In addition, this program will help to assist the GN with monitoring and management of caribou herds in Nunavut, and contribute to the scientific knowledge of caribou activity near mining operations and caribou population dynamics in Nunavut.

The following thresholds are suggested as a starting point for adaptive management and TEMMP refinement:

- Indirect Habitat Loss – Caribou movement near the Mine Area is not hindered by Mine infrastructure (i.e., mine site infrastructure, waterlines, and AWAR).

### **4.7.3 Monitoring Approach**

Deployment, data collection, and monitoring of caribou collars will be completed by GN DoE personnel. However, this information, including collar location data, will be provided to Agnico Eagle on an annual basis as part of data sharing agreement with the GN DoE. In addition, location updates will also be provided to Agnico Eagle so that proactive planning can be completed if caribou are moving towards the Mine.

If the collar data confirms that caribou are moving in the general area of the mine site, then height of land surveys will be conducted everyday in areas where caribou are commonly known to cross through the Mine area (e.g., the narrows between the northwest basin of Meliadine Lake and the southeast basin of Meliadine Lake) to determine if the herd is approaching the mine site. This will help the environment staff on-site to coordinate a response and initiate stop work orders as necessary.

## 4.8 Hunter Harvest Survey

One of the potential effects of the Mine to wildlife is increased hunter harvest efficiency as a result of the construction of the AWAR. Frequency of access likely will not change from Rankin Inlet as a result of the AWAR, but harvest efficiency may increase. Agnico Eagle has experience in acquiring traditional harvesting data from Inuit and other hunters at their Meadowbank Mine. The Meadowbank Mine constructed an AWAR from Baker Lake to the mine, which increased access and altered hunter harvest success.

Agnico Eagle renewed its Collaboration Agreement with the KHTO, in line with the Project Certificate No.006 Term and Condition 46 and 48, whereby Agnico Eagle consults with the KHTO on the Hunter Harvest Study program.

### 4.8.1 Target Species

The target species include all wildlife species that are targeted for harvest including caribou, muskox, wolves, foxes, wolverine, and waterfowl, among others. In addition, there is the potential to gather information on angling success as elevated angling pressure is anticipated, at least for Arctic char. Thresholds for adaptive management will need to be discussed with, and set in collaboration with the KHTO and GN DoE personnel, based on findings.

### 4.8.2 Objectives and Thresholds

The specific objectives of the hunter harvest survey are as follows:

- gather information on Inuit and non-Inuit harvesting rates of caribou in the Mine area;
- gather information on Inuit and non-Inuit harvesting rates of non-caribou wildlife in the Mine area;
- gain further understanding of regional distribution and seasonality of hunting and fishing activity;
- determine if the AWAR has had an effect on Inuit and non-Inuit harvesting rates of caribou and other wildlife; and
- provide information to the KHTO, GN and KIA to help make informed decisions regarding fish and wildlife management in the Rankin Inlet.

Due to a lack of existing baseline data, no thresholds related to caribou harvesting in the Mine area can be identified. Provided the data and collaboration with local harvesters is suitable, after three years of data collection through implementation of the HHS, Agnico Eagle, in collaboration with the GN DoE, will discuss the next steps to reduce increased harvest associated with improved access due to the road.

### 4.8.3 Monitoring Approach

The monitoring methods will be primarily in the form of a hunter survey. Data will be continuously collected and analyzed at the end of each calendar year and provided within the TEMMP annual report.

The HHS will seek to:

- increase and maintain hunter participant rates moving forward;

- improve resource protection;
- improve hunter awareness and education;
- increase the integration of IQ information and Traditional Knowledge; and
- increase availability of data collected for a collective approach to understanding wildlife harvest, assist Agnico Eagle's mitigative actions and GN's management decisions.

One of the greatest challenges will be hunter participation. However, Agnico Eagle has experienced these issues in the past when implementing a harvest survey as part of their Meadowbank Project and developed novel and unique mechanisms to promote increased hunter participation (i.e., prize draws, provision of full-colour calendar with participant images). Discussions with the KHTO have been previously held to introduce this concept and help to promote the implementation of this program.

Survey data collected by Agnico Eagle and in collaboration with the GN, will include documentation of harvest success including the following: number of harvested animals by species for each visit, harvesting locations, timing of harvesting, hunter efficiency (number of animals harvested/participant). Hunters will also subjectively qualify their hunting experience (i.e., casual hunter or life-long hunter) and their hunting location preferences (i.e., convenient locations, favorite hunting spots, remote areas). This information can be used to present the harvest data in addition to the data being presented based on distance from the AWAR and hunting vehicle used (i.e., ATV or truck) to determine if the AWAR is allowing for greater hunting efficiency, and if so, to what extent. Information collected from participants will be kept anonymous.

For discussion purposes, the hunter harvest survey program could be setup as described below.

#### 4.8.3.1 Hunter Efficiency – Harvest Success

To eliminate the need for stratification of the local hunter population (i.e. classification into casual and live-long hunters), and with that, the requirement to maintain this ratio throughout the study (which is likely impossible), the following approach could be considered:

- Have hunters record the following parameters for each harvest trip they undertake:
  - Harvest (species, number, sex, age class, etc. – see below)
  - Observations (species, number, sex, age class, etc. – see below)
  - Neither Harvest nor Observation (can be reported as just a "0") Evaluate data by calculating the following:

To quantify harvesting success, the proportion of trips with at least one successful harvest can be calculated relative to the total number of trips taken (assuming that each trip was initially motivated to harvest wildlife). This can be done by pooling all participating hunter data.

Not necessary, but to address the factor whether hunting was without success because no wildlife was encountered, the proportion of hunting trips with observations only (and no harvests) can be calculated. Finally, hunting trips with neither harvests nor observations can be determined as well. The three numbers can be presented monthly or annually to reflect seasonality and annual fluctuations.

#### 4.8.3.2 Use of AWAR – Travel Distances

Have hunters record the following parameters for each harvest trip they undertake:

- route from starting point (e.g., home, camp, etc.) of trip to endpoint (e.g. home, camp etc.) - indicate on map, or describe via land marks, or use GPS waypoints
- mode of transportation (truck, ATV, snow machine, boat, foot, dog team, etc.)
- use of AWAR (yes / no; if yes, report approximate distance travelled or provide starting point and endpoint). Evaluate data by calculating average travel distances from starting point to endpoint of all recorded trips; and
- success of trip (i.e., number of animals harvested including zero harvest).

These calculations can be done across a variety of temporal scales (e.g., monthly or annually) and for any species harvested (e.g., wolves usually require longer hunter travel than foxes, etc.) or by mode of transportation.

#### ***Is the use of AWAR associated with harvesting success?***

This question can be evaluated, by calculating the number / rate of successful hunting trips (as per definition above) and efficiency of those hunting trips (i.e., the number of animals harvested per trip) using AWAR versus all other routes. Can be done by month to account for differences in season (e.g., weather, daylight, species abundance) and/or by species to account for differences between large and small mammals, fish, birds, or by distance travelled on the AWAR.

#### 4.8.3.3 Information on Harvest Distribution / Wildlife Distribution / Physical Condition

Have hunters record the following parameters for each harvest trip they undertake:

- Harvest (species, number of animals, sex, age [young, mature, old], physical condition [healthy, skinny, diseased, unknown], location of harvest)
- Observation (species, number of animals, approximate distance) Evaluate data by calculating the following:
  - Calculate total # of animals per species harvested by participating hunters by month or annually.
  - Calculate percentage healthy animals per harvested species by month or annually. (can be done by sex and age class as well)
  - Calculate total number of animals per species observed by participating hunters by month or annually.
- Plot harvest locations.
- Plot approximate observation locations.

#### 4.8.3.4 *How Reliable is Reported Harvest in Hunter Harvest Study?*

There is a chance of under reporting, in particular in voluntary studies with minimal motivation (i.e. no payment). Several rates can be calculated as qualifiers of the results as follows:

- Calculate hunter participation rate for the study (i.e., how many hunters that are registered with this Hunter Harvest Survey do actually report back?) – express the ratio by month or annually and report it with the results.
- How many hunters are registered with this HHS – compared to active hunters in the community (Note: either use Priest data to get a number for active hunters or ask KHTO for a complete list of active hunters).
- Use the ratio from above and apply it to reported harvest in HHS (i.e., multiply the reported harvest numbers). Compare the results to total reported harvest in Priest study. (Note: may not work for caribou if their range shifted since the Priest study). If values are similar (same order of magnitude), HHS data can be assumed to be relatively reliable.

The HHS program will be reported on an annual basis. A HHS administrator is appointed and they meet with hunter harvest study participants on at least a quarterly basis to document harvests, which are written on the provided annual hunter harvest calendar provided by Agnico Eagle and discuss general hunting trends and observations. The HHS administrator will also conduct radio addresses and posts promotional material around the Hamlet of Rankin Inlet during the visits.

### 4.9 **Raptors**

Agnico Eagle has engaged the Arctic Raptors Research Program to develop and implement the raptor monitoring program (Arctic Raptors Inc.; Franke 2012). Additional details on methods are described in the annual reports prepared by Arctic Raptors Inc. and included in overall annual reporting for the Mine.

#### 4.9.1 **Target Species**

The target species for the raptor monitoring program will primarily be peregrine falcons; however, information will be collected on other raptor species if they occur in the LSA and RSA, including rough-legged hawks, gyrfalcons, and short-eared owls.

#### 4.9.2 **Objectives and Thresholds**

The raptor monitoring program will be completed on an annual basis with the following objectives:

- annual occupancy survey of all known nesting sites;
- first year survey of high quality habitat to search for new nesting sites;
- monitor distribution and breeding density;
- monitor clutch size and productivity; and
- marking individual adults and nestlings to identify site fidelity and mortality causes.

Thresholds for the raptor monitoring program will be developed in conjunction with the Artic Raptor Research Program and GN DoE personnel. However, a proposed threshold of no more than a 20% difference in occupancy and productivity between nest sites near Mine infrastructure (e.g., 1 km) and nest sites far from Mine infrastructure (e.g., > 1 km). In addition, site specific monitoring opportunities (e.g., cameras) will be discussed with the Artic raptor Research Program to determine potential mechanisms for differences in productivity, which can then be incorporated into adaptive management strategies.

#### **4.9.3 Monitoring Approach**

Methods will include ground-based occupancy surveys, marking of breeding adults and nestlings, remote camera monitoring (RECONYX cameras) to identify cause of mortality (i.e., nestlings), monitoring precipitation and temperature at nest sites, and potentially estimating prey abundance.

Annual activity reports and raw data will be prepared and submitted to the GN. The raw data will be shared with the GN through a data sharing agreement. All incidental wildlife observations will be recorded and reported. All permit applications will be handled by the Artic Raptors Research program.

#### **4.9.4 Mitigation and Management Scenarios**

Magnitude of disturbance to raptor nests can range from mild to extreme. Mild disturbance is unlikely to cause sufficient disturbance that would prevent falcons from engaging in normal breeding season behaviors. Mild disturbance would be any disruption that is occasional (once per week) and occurs over a short period (<20 minutes; min). In general, any occasional disturbance that involves vehicular traffic greater than 100 m from a nest site at any point during the breeding season should be considered mild. However, vehicles (passenger trucks, gravel trucks, ATVs) should not stop within 100 m of a nest site, and travel speed of vehicles should be reasonable, particularly in dry and potentially dusty conditions.

Foot traffic is also considered mild if it occurs at greater than 100 m from the nest sites and occurs for short periods (<20 min). In the event that a vehicle must stop within 100 m of a nest site, passengers should remain in the vehicle. In the event that passengers must disembark, they should endeavor to minimise the number of people exiting the vehicle at any one time.

Moderate disturbance would include disruptions like those described above, but which occur at greater frequency and/or for longer duration. On-going moderate disturbance may result in negative but sub-lethal effects (e.g. slower growth of nestlings and/or reduced body condition in adults)

Severe disturbance would likely occur in instances where vehicles repeatedly stop in close proximity (<100 m), where traffic volume is high (even without stopping), where vehicles are continuously working in one location (e.g. grader repairing a road wash-out), where foot traffic occurs with 2 or more people, or during blasting. Reduced reproductive success is likely to occur with severe disturbance, particularly repeated disruptions also occurs over long periods of time (>60 min), particularly if it occurs early in courtship or soon after the first egg is laid.

Extreme disturbance includes activities that would without doubt prevent or interrupt a breeding attempt, for example, total removal of rock out-crop on which a known nest site exists.

In general, avoidance of any disturbance is of greater importance during early occupancy and shortly after egg-laying has commenced; falcons are much less likely to abandon a nesting attempt late in incubation or after eggs have hatched and nestlings are present. Well-developed nestlings (those with evidence of second down) are at minimal risk from occasional disturbance (once per week) of short duration (<20 minutes). This includes site visits where nestlings are handled.

Most disturbance can be easily managed if it occurs occasionally (once per week) relatively far from nest sites (>100 m), over short periods of time (~20 minutes). Any activity that occurs from October 1<sup>st</sup> through May 1<sup>st</sup> should be of no concern. Mild disturbance during early occupancy and early egg-laying (May 15-June 30) is unlikely to be the cause of reproductive failure or reduced reproductive success; moderate to extreme disturbance should be avoided during this period. Moderate disturbance is unlikely to be the cause of reproductive failure or reduced reproductive success during mid- to late-incubation (June 20 – July 20) but may cause nestling mortality within the 48 hours after hatching. The hatching period extends from ~July 10 to ~July 20; it is critical that sites within 1km of mine infrastructure are identified and avoided. Thus, two windows of time emerge that are important (May 15-June 30 and July 10-July 20) and disturbance should not exceed those outlined as mild.

#### **4.10 Waterfowl and Waterbirds**

This program is designed to determine nesting distribution within 200 m, considered to be the approximate zone of influence from sensory disturbance in the FEIS, of mining and mine-related infrastructure (e.g., AWAR). The program will attempt to determine mated pair distribution and nesting success in ponds, wetlands, and lake shorelines within 200 m of Mine infrastructure. Waterfowl and waterbird density was low during baseline surveys; consequently, a low number of mated pairs is anticipated.

##### **4.10.1 Target Species**

The target species for the waterfowl and waterbirds monitoring program include ducks, geese, loons, mergansers, and swans.

##### **4.10.2 Objective and Thresholds**

The primary objective of the waterfowl and waterbird monitoring program is to determine the effects, if any, of sensory disturbance from mining activities, including access along the AWAR on breeding success or changes in distribution of mated pairs. The threshold for investigation of additional mitigation will be determined in collaboration with the GN DoE.

Threshold triggers for additional mitigation or evaluation of mitigation will be determined through discussions with appropriate ECCC and GN DoE personnel. This threshold may be difficult to establish due to low bird densities and high variability. However, thresholds will likely be based on habitat loss (i.e., 515 ha of aquatic habitat) with no additional habitat loss than FEIS predictions. After initial data collection (first 3 years of operations) and a range of natural variability is determined, breeding and productivity thresholds may be determined or refined, as appropriate.

#### 4.10.3 Monitoring Methods

Ground-based surveys will be conducted for ponds, wetlands, and lake shorelines within 200 m of mining-related infrastructure (see Figure 6). Two observers will walk along the water's edge to assess the presence, or any indication, of breeding waterfowl and/or waterbirds. One observer will walk 5 m from the water's edge, while the second observer will walk 15 m from the water's edge with the intent of flushing any breeding waterfowl or waterbird pair in the vicinity. This survey will occur during the peak of the breeding season (i.e., early July). Any observations will be recorded on a datasheet and location coordinates will be recorded. If breeding is confirmed along any portion of the surveyed areas within 200 m of mining infrastructure, then a follow-up survey will be completed only at those specific nesting sites to determine nesting success.

In consultation with the GN, monitoring will be conducted for the first 3 years of operations. This will assist in determining the effectiveness of this monitoring program to determine effects of the Mine on waterfowl; this will inform the frequency of monitoring thereafter. Annual reporting will be completed for this component of the overall monitoring program.

#### 4.11 Upland Birds and Shorebirds

This program is designed to measure mining-related effects on upland bird (i.e., songbirds) and shorebird species richness, diversity, and relative abundance. Specifically, the intent is to measure these parameters in response to Mine and increased traffic along the AWAR. Surveys through the Program for Regional and International Shorebird Monitoring Program (PRISM; CWS 2008) will be completed for upland birds and shorebirds. The objectives of PRISM include estimating breeding population size; describing the distribution, abundance, and habitat relationships; and monitoring trends in breeding population size of shorebirds (Bart et al. 2005), and we will also use this method for assessing the same parameters for upland birds.

The PRISM monitoring will be used to assess changes in parameters from general mining activities whereas the point counts will be used to assess changes due to increased traffic along the AWAR, per consultation with ECCC. The PRISM survey methods are used consistently across North America so data can be compiled and compared across the continent. PRISM plots will be selected to compare shorebird data near the mine with data collected outside the zone of influence of the mine (i.e., control areas).

##### 4.11.1 Target Species

The target species for the upland bird and shorebirds monitoring program include upland migratory birds (i.e., songbirds and shorebirds) and non-migratory birds (i.e., ptarmigan).

##### 4.11.2 Objective and Thresholds

The objectives of the upland bird and shorebirds monitoring program are to determine any mine-related changes in upland and shorebird abundance, species richness, diversity, and distribution. Upland bird point count surveys will specifically examine the potential effects of the AWAR (i.e., increased traffic and dust) on songbird abundance, species richness, diversity, and distribution along the AWAR. PRISM surveys are focused on in-kind contributions of monitoring results to regional data sets through the PRISM for the

Arctic, to support investigations in changes to abundance, distribution and other parameters as a result of general proximity to mining related disturbance.

Threshold triggers for additional mitigation or evaluation of mitigation will be determined through discussions with appropriate ECCC personnel. This threshold may be difficult to initially establish due to low bird densities and high variability.

#### **4.11.3 Monitoring Methods**

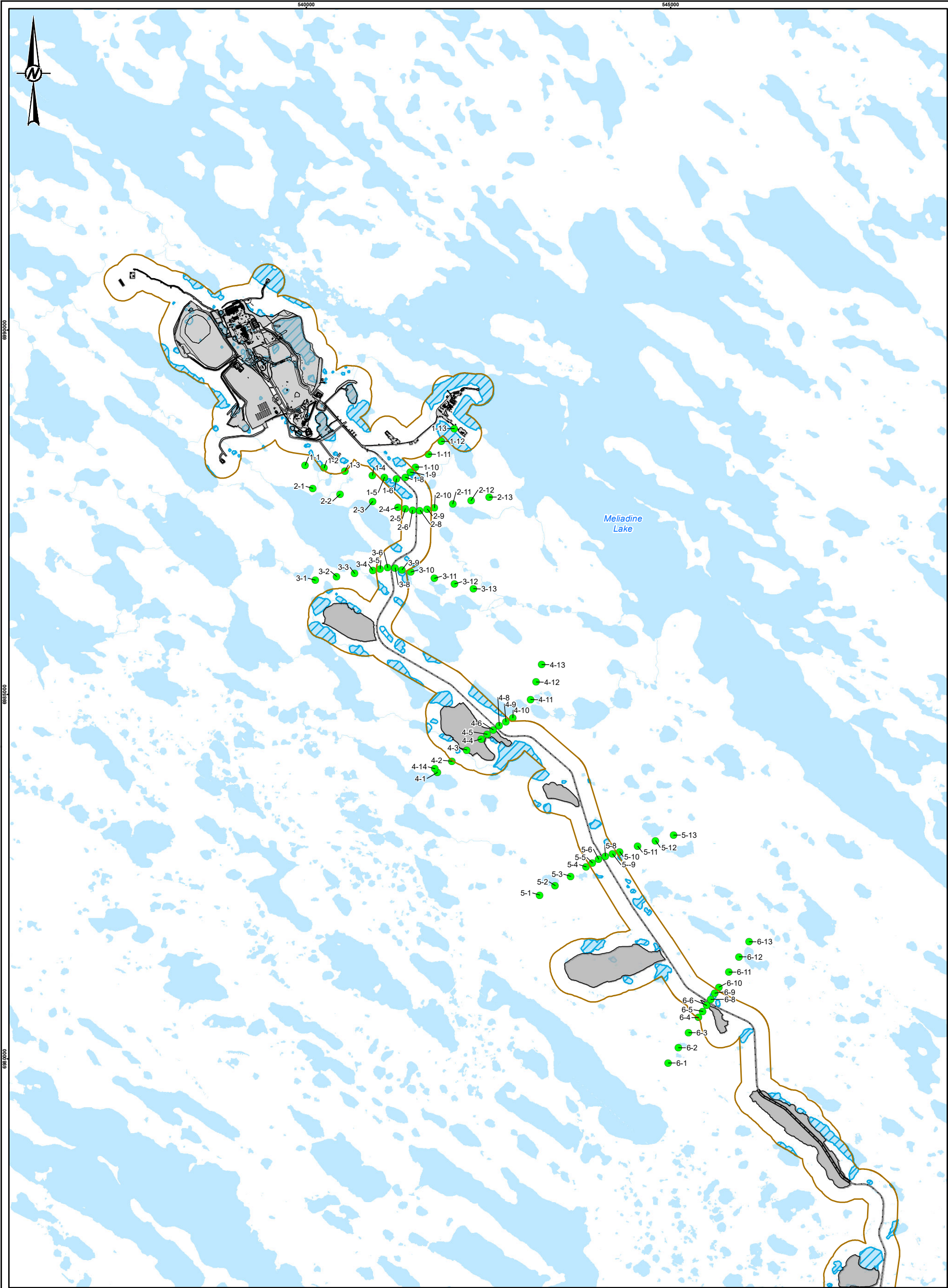
Upland bird plots (point count surveys) will be completed along transects on either side of the AWAR. Transect length has yet to be determined and will be planned based on topographic constraints (i.e., cliffs), waterbody constraints, and habitat consistently along the AWAR. However, it is anticipated that transect length will be at least 1 km on either side of the road (2 km in total) with the first point count occurring at 50 m from the road on either side of the transect and each subsequent plot spaced 100 m from the center of the preceding plot. Transects are placed at 0.5, 1, 2, 5 and 10 km from the Mine site along the AWAR (see Figure 6). Data from these surveys will be compared to the predicted ZOI and evaluate impacts due to activity such as reduced habitat effectiveness, from the AWAR.

PRISM plots completed as part of the baseline surveys were rapid plots, which are 400 m x 300 m (12 ha) following the PRISM protocols (CWS 2008). Two observers spaced at 25 m intervals walk through each plot along a systematic grid and record all birds and nests observed. A sufficient sample size will be determined and established within control areas (i.e., outside the zone of influence of the mine) and mine areas (i.e., within the zone of influence of the mine). Plots will be placed within a single habitat type, if possible. Data analysis will be completed to determine differences in measured parameters (i.e., relative abundance, richness, diversity) between control plots and mine plots while considering temporal patterns.

In consultation with the GN, upland bird point count surveys will be conducted in the proposed infrastructure for the first 3 years of operations. This will assist in determining the effectiveness of this monitoring program to determine effects of the Mine on upland birds and shorebirds; this will inform the frequency of monitoring thereafter. In consultation with ECCC in 2019, PRISM surveys will monitor 24 randomly selected plots (of a selected subset of 48 regional plots in proximity to the Mine) over 2 years, every 5 years.

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545000



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545000

LEGEND

- BREEDING BIRD SURVEY
- MINE FOOTPRINT
- MINE INFRASTRUCTURE
- 200 m BUFFER OF MINE FOOTPRINT
- WATERBODY WITHIN 200 m OF INFRASTRUCTURE
- ALL-WEATHER ACCESS ROAD (AWAR)
- WATERBODY
- WATERCOURSE

NOTE(S)

1. TSF, WRSF1, WRSF2, CP1 ARE THE MAXIMUM EXTENT UNDER THE APPROVED MINE PLAN AND DO NOT REPRESENT SIZE IN 2018.
2. BORROW PIT B1A IS EXCLUDED AND IS NOT ILLUSTRATED IN THE CURRENT FOOTPRINT.
3. THE PROPOSED MINE PLAN INCLUDES TIRIGANIAQ PIT 1, TIRIGANIAQ PIT 2, AND WASTE ROCK STORAGE FACILITY 3 (WRSF3) AND ASSOCIATED INFRASTRUCTURE; THESE ITEMS HAVE NOT BEEN CONSTRUCTED YET (AS OF THE END OF 2018) AND THEREFORE WERE NOT INCLUDED ON THIS MAP.

CLIENT

AGNICO EAGLE MINES LIMITED

CONSULTANT

YYYY-MM-DD	2020-06-17
DESIGNED	KB
PREPARED	CC/MH/CDB
REVIEWED	DC
APPROVED	CLT



REFERENCE(S)

1. BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED AND NATURAL RESOURCES CANADA.

DATUM: NAD 83 PROJECTION: UTM ZONE 15

PROJECT

MELIADINE GOLD PROJECT  
NUNAVUT

TITLE

2019 SURVEYED SHORELINES AND BREEDING BIRD SURVEY  
LOCATIONS

PROJECT NO.  
19132390

CONTROL  
8000/8010

REV.  
0

FIGURE  
5

## 4.12 Wildlife Incidents

Wildlife incidents refer to a range of possible occurrences at the Mine, including:

- human-wildlife interactions that present a risk to either;
- wildlife-caused damage to property or delay in operations;
- wildlife deterrent actions; and
- wildlife injury or mortality.

Incidents may also be observed through surveillance monitoring activities (see Section 4.3 and 4.4). All incidents will be investigated and reported. Documenting incidents allows for adaptive management and further development of mitigation. All wildlife incidents will require immediate follow-up. They will be reviewed and reported to determine if mine operations contributed to an incident, and what can be done to prevent similar occurrences in future. For greater detail on wildlife encounter and responses, see the Wildlife Protection and Response Plan (Appendix III).

### 4.12.1 Target Species

Target species for these surveys include terrestrial mammals, such as caribou, Arctic fox, wolf, among other less frequently observed species (e.g., muskoxen and polar bear) and birds including raptors, waterfowl, shorebirds, and songbirds. Of particular interest to this program, would be wildlife encounters by carnivores (e.g., Arctic fox) as they are potentially attracted to the site.

### 4.12.2 Objectives and Thresholds

Provide appropriate information to on-site Environment staff for dealing with wildlife interactions at the Meliadine mine site. Provide an array of example encounters so that appropriate mitigation and management can be implemented to keep humans and wildlife safe, using only humane control methods.

As previously mentioned, anticipated thresholds will be as follows:

- Mine Infrastructure Mortality – no more than 1 caribou, 20 Arctic fox, 1 waterfowl and 1 upland bird, per year.
- Vehicle Collisions – no more than 1 caribou/year.

### 4.12.3 Monitoring Approach

All incidents and deterrent actions will be investigated and documented. This will include photographs, names of people involved, the nature of the incident, and supporting information such as the time, date, location, and follow-up actions that occurred. Wildlife incident monitoring will be undertaken as required, continuously throughout the construction, operation, and closure phases of the Mine. Further details can be found in the Wildlife Protection and Response Plan in Appendix III.

All incidents will require follow-up to determine what can be done to prevent similar occurrences in future. All wildlife mortalities will be reported to GN DoE immediately. Migratory bird mortalities will also be reported to ECCC. Agnico Eagle has committed to reporting any non-Mine-related mortalities or incidents of migratory birds detected within the Mine area to ECCC, including any detected through surveillance monitoring (per Section 4.3 and 4.4).

#### **4.12.4 Mitigation and Management Scenarios**

##### **Response to Encounters**

Predatory mammals such as wolves, wolverine, arctic fox and grizzly bears rarely attack people; however, they are extremely strong and vicious, and should be given respect. Polar bears are known to attack humans. Members of the dog family (such as wolves and foxes) are more at risk of carrying rabies, and other zoonotic diseases, and therefore should be avoided. Arctic fox in particular is easily tamed, quickly losing their fear of humans and often approaching very close. Sick or injured animals may no longer be able to feed themselves and could be in a state of starvation. Often, they show few physical signs that something may be wrong, but typically act more aggressively or even 'friendly' towards humans. Therefore, a close encounter with a predatory mammal could be dangerous. All bites and scratches from wildlife should be reported immediately to Health & Safety since animals can be vectors for rabies.

***If you encounter a predatory mammal, the following actions should be taken:***

- back away slowly and do not turn your back on the animal;
- do not make sudden movements;
- do not make loud noises or attempt to scare the animal if it is simply traveling through the area;
- use radio/satellite phone to report the presence of the animal to the Environmental department;
- stay in radio/phone contact until the animal moves away or you have returned to a safe area. (e.g. inside vehicle or building); and
- wait for the animal to pass before continuing work in the area.

***If the predatory mammal does not back away, or shows interest in you:***

- continue to back away slowly and ensure a 10 m distance between yourself and the animal;
- make sure the animal has a safe route of escape;
- make noise to alert the animal of your presence or to scare it off;
- avoid provoking it;
- return to a safe area as soon as possible (e.g. inside a building or vehicle); and
- keep the Environmental department informed of situation using the radio/phone.

***If the predatory mammal still does not back away, call for deterrent action by the Environment Department***

The Environment Department is to treat all predatory mammals that are threatening or aggressive as they would treat a grizzly bear or polar bear, which are perceived to be most dangerous. All predatory mammals that are showing interest in a person or site facilities must be aggressively deterred to prevent habituation to the site. Detailed response recommendations are provided in Section 3.2.2.3 below. If an animal is not of an immediate safety concern, the Wildlife Response team should discuss options to deter or remove the animal with GN conservation personnel.

**Environment Department Protocols for Managing Problematic Predatory Mammals**

As part of the detailed response plan, the Environment Department will follow the procedures included here when responding to predatory mammal sightings and encounters. It is assumed that the reporting person(s) has followed procedures for predatory mammal incidents and has requested the Environment Department to be dispatched due to the failure of human presence to deter the predatory mammal. If an animal is not of an immediate safety concern, the Environment Department should discuss options to deter or remove the animal with GN conservation personnel. All wildlife issues are to be recorded in the wildlife database.

***The Environment Department will:***

- Collect all deterrent equipment and receive briefing from the Environmental Coordinator or delegate (s) on location and circumstances of the call.
- When firearms are to be used there will always be two individuals, one person with a firearm (12 gauge) for deterrent use, the other as back up having a rifle with lethal force. No lethal force will be taken without consent from the Environmental Coordinator in conjunction with the consultation of the Government of Nunavut Wildlife Officer unless the situation is deemed to be life threatening.
- The appropriate action, usually less than lethal deterrent, will be chosen and used in an effort to scare the predatory mammal away.
- If the deterrent is successful, the incident will be recorded in the Wildlife database and should detail the type and level of deterrent used, information on the predatory mammal involved, and all information on the circumstances leading up to the incident.

***If the deterrent is not effective and the predatory mammal continues to approach or doesn't move away from the area of human activity or Mine footprint:***

- Increase deterrent efforts to less than lethal projectile (rubber bullet) if not already being employed.
- Ensure the animal has an open escape route.
- Continue aggressive use of less than lethal projectile deterrents to try and chase the animal away.

All but the most aggressive animals should have been deterred at this point. The situation is now extremely dangerous and the Environment Department must be ready to use lethal force.

***The risk to human life or property is imminent since the predatory mammal has not responded to non-lethal deterrent options and the safety of the team or site property is now compromised.***

- Shoot with the intention of stopping the threat, using the buckshot or 1-ounce lead slugs, as appropriate, to kill the animal.
- Shots should be aimed at the chest area, not the head or hind quarters.
- If lethal force has been used, the Environment Department must complete a full report detailing the event immediately.
- The GN conservation officers will be notified by phone. Direction will then be given to properly dispose of the carcass.
- Any wildlife showing signs of rabies will be killed (never shot in the head) and reported.

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**SECTION 5 • REPORTING**

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An annual Terrestrial Environment Monitoring Summary Report for the Mine will be completed. The purpose of this report will:

- summarize the annual data collected from the various terrestrial monitoring programs;
- identify and communicate natural variation and potential mine-related changes in terrestrial populations within and adjacent to the Meliadine Mine area through the interpretation of accumulative monitoring datasets;
- provide the objectives, methods, schedule and frequency implemented, historical and current year results, a comparison to impact predictions, and the mitigation and management recommendations of each monitoring program; and
- include information about when mitigation was intensified (e.g., work stoppages) and/or reduced in accordance with monitoring triggers.

## SECTION 6 • SUMMARY

This TEMMP will be reviewed and updated on a regular basis as the Mine developed through detailed design, construction, operations, closure and post-closure. Monitoring will be focused on the wildlife and bird VECs identified in the FEIS, as described in the section 2.3 of this document, and where primary or minor effects pathways have been identified as a result of the Mine. Monitoring study design and methods will be consistent with monitoring programs being implemented at other mining operations in Nunavut (e.g., Nunavut Environmental Consulting 2012). A summary of predicted effects, monitoring thresholds, monitoring methods and frequency are presented in Table 4, and were introduced and discussed above.

**Table 4. Summary of Predicted Effects, Threshold, and Proposed Monitoring Methods for the Meliadine TEMPP**

Predicted Effect	Proposed TEMMP Thresholds	Monitoring Methods	Frequency of Data Collection
<b>Vegetation (Wildlife Habitat)</b>			
Habitat Loss	Terrestrial – 2,951 ha Aquatic – 515 ha	Ground Surveys, Mapping, GIS Analysis	Every 3 Years
Habitat Degradation by Contamination	TBD – SLRA <sup>1</sup> No effects to plant health from dust deposition	Vegetation and Soil Samples	Every 3 Years (Baseline 2017)
Habitat Reclamation following Mine Closure	NA	Ground Surveys, Vegetation Plots, Mapping	Once pre-construction (Baseline 2017), and 3 times Post-Closure
<b>Ungulates</b>			
Habitat Loss and Degradation	No greater than 2,951 ha of terrestrial habitat loss	Ground Surveys, Mapping, GIS Analysis	Every 3 Years
Sensory Disturbance	<10% caribou deflections from AWAR	Ground Surveys, Satellite- collaring	Daily/Weekly
Vehicle Collisions	1 individual	Ground surveys	Daily
Hunting by Rankin Inlet Residents	After 3 years of data collection, in collaboration with GN, establish a threshold level	Hunter Harvest Study	Collected throughout the year and reported annually
Other Mine-related Mortality	1 individual	Ground surveys	Daily
Exposure to Contaminated Water or Vegetation	TBD – SLRA <sup>1</sup>	Vegetation and Soil Samples	Every 3 Years
<b>Predatory Mammals</b>			
Mine-related Mortality	20 Arctic Fox	Ground Surveys Cameras in attractant areas	Daily

Predicted Effect	Proposed TEMMP Thresholds	Monitoring Methods	Frequency of Data Collection
<b>Raptors</b>			
Disturbance of Nesting Raptors	TBD in consultation with GN and Alastair Franke, related to occupancy and productivity.	Active Nest Monitoring	Nests within 200m – Daily, Nests from 200-1000m - Weekly
Mine-related Mortality	TBD in consultation with GN and Alastair Franke	Ground Surveys, Collision Reporting System	Mine Site-Daily AWAR - Twice per Week
<b>Waterbirds</b>			
Habitat Loss and Degradation	515 ha of Aquatic Habitat	Ground Surveys, Mapping, GIS Analysis	Every 3 Years
Disturbance of Nesting Waterfowl	TBD once NRV <sup>2</sup> is established through consultation with ECCC and GNDoe	Shoreline Surveys	Annually
Exposure to Contaminated Water or Vegetation	TBD – SLRA <sup>1</sup>	Vegetation and Soil Samples	Every 3 Years
Mine-related Mortality	1 individual	Ground Surveys, Collision Reporting System	Mine Site-Daily, AWAR - Twice per Week
<b>Other Breeding Birds</b>			
Habitat Loss and Degradation	No greater than 2,951 ha of terrestrial habitat loss	Ground Surveys, Mapping, GIS Analysis	Every 3 Years
Exposure to Contaminated Water or Vegetation	TBD – SLRA <sup>1</sup>	Vegetation and Soil Samples	Every 3 Years
Mine-related Mortality	1 individual	Ground Surveys, Collision Reporting System	Mine Site-Daily AWAR - Twice per Week
Changes in Breeding Bird Populations	TBD once NRV <sup>2</sup> is established through consultation with ECCC	Breeding Bird Point Counts, PRISM	Every 3 years, PRISM – Plots surveyed over 2 years every 5 Years

<sup>1</sup> SLRA – Screening Level Risk Assessment

<sup>2</sup> NRV – Natural Range of Variability

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**SECTION 7 • REFERENCES**

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**APPENDIX I • CONCORDANCE TABLE - APPLICABLE NIRB PROJECT CERTIFICATE NO. 006  
(AMENDMENT 002) TERMS AND CONDITIONS**

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**Table I-5: Concordance Table with Applicable NIRB Project Certificate No. 006 (Amendment 002) Terms and Conditions**

Term	Condition	TEMMP V4 Section Reference
37	The Proponent shall incorporate protocols for monitoring for the potential introduction of invasive vegetation species (e.g. surveys of plant populations in previously disturbed areas) into its Terrestrial Environment and Monitoring Plan. Any introductions of non-indigenous plant species must be promptly reported to the Government of Nunavut Department of Environment.	4.6
38	The Proponent shall conduct sampling to determine baseline levels for metals in soils found in areas with berry-producing plants near the Project area and shall update relevant vegetation sections within the Terrestrial Management and Monitoring Plan to incorporate ongoing monitoring of these parameters prior to commencing operations.	4.6, Appendix IV
39	The Proponent shall develop and establish an on-going monitoring program to determine the distribution, abundance, and health of vegetation species used as caribou forage (such as lichens) near Project areas, prior to commencing operations.	4.6
40	The Proponent shall review, on an annual basis, all monitoring information and the vegetation mitigation and management plans developed under its Environmental Management Plan and Terrestrial Environment and Monitoring Plan (TEMMP) and adjust such plans as may be required to effectively prevent or reduce the potential for significant adverse project effects on vegetation abundance, diversity and health, taking into account lessons learned at other northern mining developments where appropriate.	4.6, Appendix IV
44	In consultation with the Government of Nunavut (GN) and other relevant parties, such as the Terrestrial Advisory Group, the Proponent shall further develop its Terrestrial Environment Management and Monitoring Plan (TEMMP) to include increased caribou monitoring across the regional study area and additional details on the scope and design of monitoring programs. The Proponent shall also demonstrate consideration for contributing to existing and planned regional monitoring initiatives associated with terrestrial wildlife and wildlife habitat and the incorporation of Inuit Qaujimaningit, Inuit Qaujimajatuqangit, Traditional and Community Knowledge, as appropriate. Monitoring should be adequate to test impact predictions, monitor impact thresholds and trends over time, and to support implementation of mitigation measures as proposed in the Final Environmental Impact Statement and any subsequent Addenda submitted by the Proponent. The Proponent in consultation with the Terrestrial Advisory Group shall revise the 2021 Technical Memorandum entitled "Collared Caribou Meliadine All-Weather Access Road Interactions" describing the crossings and deflections of caribou in relation to the all-weather access road as assessed using caribou collar data and shall provide a copy to the NIRB prior to construction/installation of the waterlines.	1.3, 1.5, 2.5, 3.1.8, 4.3.3, 4.7
45	The Proponent shall demonstrate consideration for cooperating with existing and planned regional and/or community-based monitoring initiatives associated with terrestrial wildlife and wildlife habitat that produce information pertinent to mitigating project-induced impacts. The Proponent shall give special consideration for supporting regional studies of population health and harvest programs for Qamanirjuaq caribou which help address areas of uncertainty for Project impact predictions.	1.3, 4.8

Term	Condition	TEMMP V4 Section Reference
46	<p>The Proponent shall update its Terrestrial Environment Management and Monitoring Plan (TEMMP) for the Project to include a detailed harvest study prepared in consultation with the Government of Nunavut (GN) and other affected parties. The design of the harvest study should demonstrate consideration for the following:</p> <ul style="list-style-type: none"> <li>a. Hiring of a dedicated local survey coordinator through local Hunters and Trappers Organizations (HTOs) and provision of adequate resources for the HTOs to run the program;</li> <li>b. The potential effects on caribou populations and on caribou behaviour resulting from increased human access caused by the all-weather access road and associated roads and trails; and,</li> <li>c. Increasing local knowledge of the project development areas, including establishing baseline harvesting levels prior to unrestricted public access on the all-weather access road.</li> </ul>	4.8
47	The Proponent shall share information with the Government of Nunavut (GN) relating to the migration of caribou and include the GN as a party respecting caribou monitoring and movement through Project development areas, including the all-weather access road and associated roads and trails.	4.1, 4.2, 4.3, 4.4, 4.5, 4.7, 4.8
52	The Proponent shall undertake periodic surveys and a habitat assessment for muskoxen in the regional study area by partnering with, or complementing, the existing regional muskox monitoring programs.	4.3, 4.4, 4.5
53	Prior to construction of Project infrastructure including the waterlines and Phase 2 of the all-weather access road, the Proponent shall conduct a survey that is sufficient to locate any dens of foxes, bears or wolverines that could be damaged or destroyed during construction or operation of the Project.	4.4
54	The Proponent shall ensure that road safety barriers, or berms, or waterline coverings associated with Project infrastructure, all-weather access road and associated roads/trails and the waterlines are constructed to allow for the safe passage of caribou and other terrestrial wildlife while achieving the objective of separating public road use with Project-related mine traffic or transport of saline effluent.	4.3
55	In consultation with the Government of Nunavut (GN) and other affected parties, the Proponent shall set thresholds for direct mortality of wolf, grizzly bear, polar bear, wolverine, and fox to ensure monitoring and mitigation for the Project is responsive to undesirable rates of mortality. The Proponent shall reach an agreement with the appropriate Designated Inuit Organization regarding compensation or any direct mortality of wildlife resulting from the Project.	4.4, 4.12.2, 6.0

Term	Condition	TEMMP V4 Section Reference
56	<p>The Proponent shall report annually to the NIRB regarding its terrestrial environment monitoring efforts, with inclusion of the following information:</p> <ul style="list-style-type: none"> <li>a. Description of all updates to terrestrial ecosystem baseline data;</li> <li>b. A description of the involvement of Inuit in its monitoring programs;</li> <li>c. A detailed presentation and analysis of the distribution relative to Project infrastructure and activities for caribou and other terrestrial mammals observed during surveys and incidental sightings;</li> <li>d. Results of the annual monitoring program, including field methodologies and statistical approaches used to support conclusions drawn; and,</li> <li>e. An assessment and presentation of annual environmental conditions including timing of snowmelt, green-up, as well as standard weather summaries.</li> </ul>	5.0
57	<p>Within its annual report to the NIRB, the Proponent shall incorporate a review section which includes:</p> <ul style="list-style-type: none"> <li>a. An examination for trends in the measured natural variability of Valued Ecosystem Components in the region relative to the baseline reporting;</li> <li>b. A detailed analysis of wildlife responses to operations with emphasis on wildlife behaviour, mortalities and displacements (if any), responses to operations of the all-weather access road and associated access roads/trails, and the waterlines ;</li> <li>c. A demonstration and description of how the monitoring results, including the all-weather access road, associated access roads/trails, and waterlines contribute to cumulative effects of the project; and,</li> <li>d. Any proposed changes to the monitoring survey methodologies, statistical approaches or proposed adaptive management stemming from the results of the monitoring program.</li> </ul>	5.0
59	If Species at Risk or their nests and eggs are encountered during Project activities or monitoring programs, the primary mitigation measure must be avoidance. The Proponent shall establish clear zones of avoidance based on the species-specific nest setback distances outlined in the Terrestrial Environment Management and Monitoring Plan.	4.9, 4.10, 4.11
61	Prior to bird breeding season, the Proponent shall either conduct clearing activities or identify and install nesting deterrents (e.g., flagging) to discourage birds from nesting in areas likely to be disturbed by construction/clearing activities. If clearing is to take place during the nesting season, a nest survey should take place to identify nests and any identified nests must remain undisturbed until the young have fledged or left the nest. Any nests identified shall be included as part of the annual reporting for the Terrestrial Environmental Mitigation and Monitoring Plan (TEMMP).	4.3, 4.4, 4.9, 4.10, 4.11, 5.0
62	The Proponent shall protect any nests found (or indicated nests) with a buffer zone determined by the setback distances outlined in its Terrestrial Environment Mitigation and Monitoring Plan (TEMMP), until the young have fledged. If it is determined that observance of these setbacks is not feasible, the Proponent will develop nest-specific guidelines and procedures to ensure bird's nests and their young are protected.	4.3, 4.4, 4.9, 4.10, 4.11

Term	Condition	TEMMP V4 Section Reference
71	The Proponent shall develop detailed and robust mitigation and monitoring plans for migratory birds, reflecting input from relevant agencies, the Kivalliq Inuit Association and communities.	4.9, 4.10, 4.11
72	The Proponent shall continue to develop and update relevant monitoring and management plans for migratory birds under the Proponent's Environmental Protection Plan and Terrestrial Environment Mitigation and Monitoring Plan (TEMMP) prior to construction. The key indicators for follow up monitoring under this plan will include upland birds (including migratory birds), waterbirds, raptors, and seabirds including migration and wintering.	4.9, 4.10, 4.11
73	The Proponent's monitoring program shall assess and report, on annual basis, the extent of terrestrial habitat loss due to the Project to verify impact predictions and provide updated estimates of the total Project footprint.	3.1.1, 4.6, 5.0
105	The Proponent is strongly encouraged to consider incorporating information obtained from local outfitting and guiding businesses into its Hunter Harvest Survey where possible, and to include these organizations as potential respondents to surveys undertaken.	4.8
118	<p>The Proponent shall include in an updated Terrestrial Wildlife Management and Monitoring Plan (TEMMP), plans for increased caribou monitoring efforts including weekly winter track surveying and summer and fall surveys undertaken on foot twice per month. These results shall be reported to the NIRB with the Proponent's annual reporting requirements.</p> <p><u>The Proponent shall, in consultation with the Terrestrial Advisory Group or appropriate parties, develop a decision tree outlining mitigation and monitoring steps to be implemented when caribou in specified group sizes are observed within specified distances of the Project's AWAR and waterlines.</u></p>	3.1.8, 4.2, 4.3, 4.4, 5.0 Appendix II
119	<p>The Proponent shall include within its updated Terrestrial Wildlife Management and Monitoring Plan (TEMMP), a commitment to establishing deterrents along the AWAR at any areas where it is observed that caribou are attracted to the AWAR and their presence may present a risk of collisions with traffic along the AWAR (such as areas where caribou are utilizing the AWAR to facilitate movement, areas where caribou may be licking minerals/road salt from the road, areas where caribou are gathering to avoid insects, etc.).</p> <p><u>Prior to the waterlines becoming operational, the Proponent shall specify within the TEMMP and/or Spill Contingency Plan measures that will be implemented to prevent caribou from accessing or being exposed to water spilled, or otherwise released from the waterlines.</u></p>	Appendix II, Appendix III

Term	Condition	TEMMP V4 Section Reference
132	The Proponent shall, in consultation with the groups listed as Responsible Parties above, and any other parties considered by the Group to be necessary, establish a Terrestrial Advisory Group (TAG). The TAG shall hold its first meeting prior to any construction/installation of the waterlines. The central mandate of the TAG will be to continually review and refine impact management, mitigation, and monitoring details within the Terrestrial Environment Management and Monitoring Plan (TEMMP). The TAG Members will collaborate to share and consider methods, results, and analysis from caribou and terrestrial environment studies and monitoring Inuit Qaujimaningit, Inuit Qaujimajatuqangit, Traditional and Community Knowledge shared by knowledge holders, and other terrestrial environment monitoring data as it becomes available. The Proponent will consider the information shared by the TAG Members for incorporation into the Project's impact management, mitigation, and monitoring measures related to the protection of terrestrial wildlife and wildlife habitat as appropriate. Agnico Eagle shall be responsible for demonstrating how the information shared and considered by the TAG has been incorporated into the Project's impact management, mitigation, and monitoring measures related to the protection of terrestrial wildlife and wildlife habitat as appropriate.	1.3, 1.5, 2.5, 3.1, 4.3, 4.4 Appendix II Appendix III

**APPENDIX II • CARIBOU MIGRATION PROCEDURE – MELIADINE PROJECT**

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**DOCUMENT ID: MEL-ENV-PRO Caribou-Muskoxen Migration**

**People concerned: Agnico Eagle employees, contractors, visitors on the Meadowbank site**

**Effective Date: 2018-07-13**

This procedure corresponds to the required minimum standard. Each and everyone also have to comply with the rules and regulations of the Nunavut Government in terms of health and safety at work.

Rev #	Date	Description	Initiator
1	2018-07-13	Converted to intellex format	Patrick Shannon
2	2019-11-01	Reviewed	Bethany Hodgins

**Objective:**

- To prepare for caribou/muskoxen migration, to provide consistency on work allowed on site and the AWAR, and to standardize the monitoring surveys performed by Environmental Technicians on site for the caribou migration protocol.

**Definitions (If applicable):**

Tool/Equipment Required	PPE Required
<ul style="list-style-type: none"> <li>- GPS</li> <li>- Binoculars</li> </ul>	<ul style="list-style-type: none"> <li>- Hard Hat</li> <li>- Safety Glasses</li> <li>- High Visibility Clothing</li> <li>- Steel Toes</li> </ul>

Specific Training Requirements
<ul style="list-style-type: none"> <li>• N/A</li> </ul>

Caribou Migration Alerts and Work Protocols
<p><b>Scope</b></p> <p>During the summer season, approximately late June or early July, herds of caribou migrate through or close to the Meliadine site. Caribou monitoring is required by the Environment Department to prevent any disturbance to the caribou herds and to implement the work suspension protocol, if needed.</p> <p><b>Procedures</b></p> <p>The caribou migration passes through the Meliadine site and along the All Weather Access Road (AWAR) generally in the beginning of July each year. The migration can be several weeks long. As part of the Project's commitments including the IIBA and TEMMP, during the migration period Agnico Eagle (AEM) has implemented a caribou monitoring and work suspension protocol. As part of this protocol, AEM commits to minimize sensory disturbances at the mine site and along the AWAR.</p> <p>The caribou monitoring protocol is initiated at the mine site and along the AWAR when caribou are observed to be within 10 km of the site. The Environment Department begins ground surveys twice per day until &gt;50 caribou are observed within 5 km of the project. At this point the frequency of surveys is increased to three times per day. All of the survey observations are communicated to the KIA, GN, and HTO, as well as all workers for the Project in the form of a "caribou migration alert." Following this alert, 1 of 3 levels will be assigned to the project site deepening on where and how many caribou are observed.</p> <p><b>Level 1:</b></p>

Definition: No caribou within the 5 km protection zone

Work activities permitted:

ALL WORK ACTIVITIES PERMITTED

### **Level 2:**

Definition: >50 caribou within the 5 km protection zone, but not within visual contact of the specific work area

All heavy equipment must cease during Level 2.

Work activities permitted:

- Underground hauling permitted to transfer pad, limited hauling to waste rock pile;
- Light vehicle traffic permitted with a speed restriction of 30 km/h if no caribou are present within 100 m of the road. If caribou present, vehicle must pull aside and wait for caribou to pass;
- Surface activities using the following equipment: manlift, scissor lift, sucker truck, fuel truck, boat;
- Manual power tools can be used outside building (ex. Carpentry, welding, painting, etc...);
- Concrete pouring can occur only after receiving permission from the Environment Department;
- Moving one piece of heavy equipment to a garage for maintenance purposes ONLY; and
- All work inside building can be performed with closed doors (including maintenance, Anfo plant, warehouse, etc.).

### **Level 3:**

Definition: Large caribou herds present on site (>100)

Initiate full work suspension at the mine site – no heavy equipment including non-essential light vehicle traffic.

Work activities permitted:

- Indoor activities with garage door closed;
- Emergencies services;
- Underground operations;
- Refueling of essential generator and power supplies;
- Operation/maintenance of water treatment systems;
- Critical inspections required in case of a malfunction;
- Intervention in case of a reportable spill; and
- Mill operations.

Along the AWAR, all vehicle traffic will stop when >50 caribou are within 100 m of the road. Whenever caribou are seen near the road, the vehicle MUST give the caribou right-of-way.

When the AWAR is closed, any traffic related to migration management will be reduced to 30 km/hr. When the large herds are in proximity to the roads, but outside the 100 m threshold, the road speed will be reduced to 30km/hr.

**To determine which of the following levels should be enacted, consult the decision tree at the end of this document.**

### **Caribou Surveys Performed by Technicians**

### Procedure

1. The Environment Department will consult the most recent Caribou Locations Map daily, which is issued by the Environmental Compliance Counsellor to determine the progress of the Herd.  
[N:\Environment\WILDLIFE\07 - Caribou\Caribou Collar map - INTERNAL USE ONLY](#)
2. The survey will be performed at 6 locations around Meliadine project. The frequency of daily surveys are determined based on the **decision tree detailed at the end of this document**.

Stations to be completed:

Survey Stations	GPS Location	
	Easting	Northing
Core Box Cemetary (Explo Laydown)	542090	6988656
Tank 9 (Fuel Farm)	541254	6988463
Ind. Pad (Com. Platform)	539161	6990402
New Collar Raise Road	537580	6990792
Quarry B5	540680	6985933
Emulsion Plant	537580	6990792

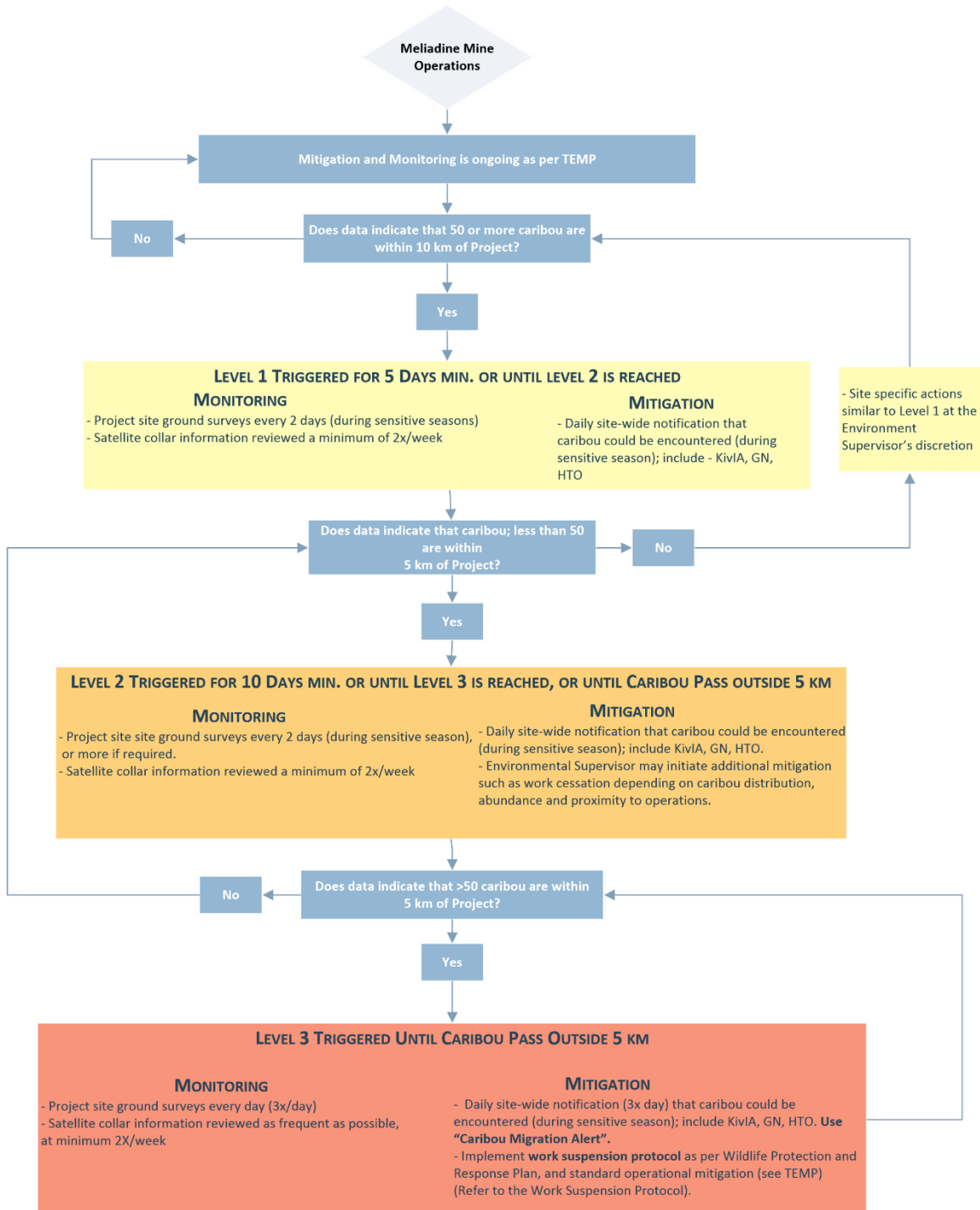
3. Approximate area, time, and number of individual's part of the caribou herd, as well as the distance of the herd from the project are documented.
4. Survey information will be made available to the Environment Coordinator three times per day (morning, lunch and evening) and will be issued as a Caribou Migration Alert Notification. These notifications will be sent to all stakeholders including: Meliadine site employees and contractors, KIA, GN, and the local HTO.

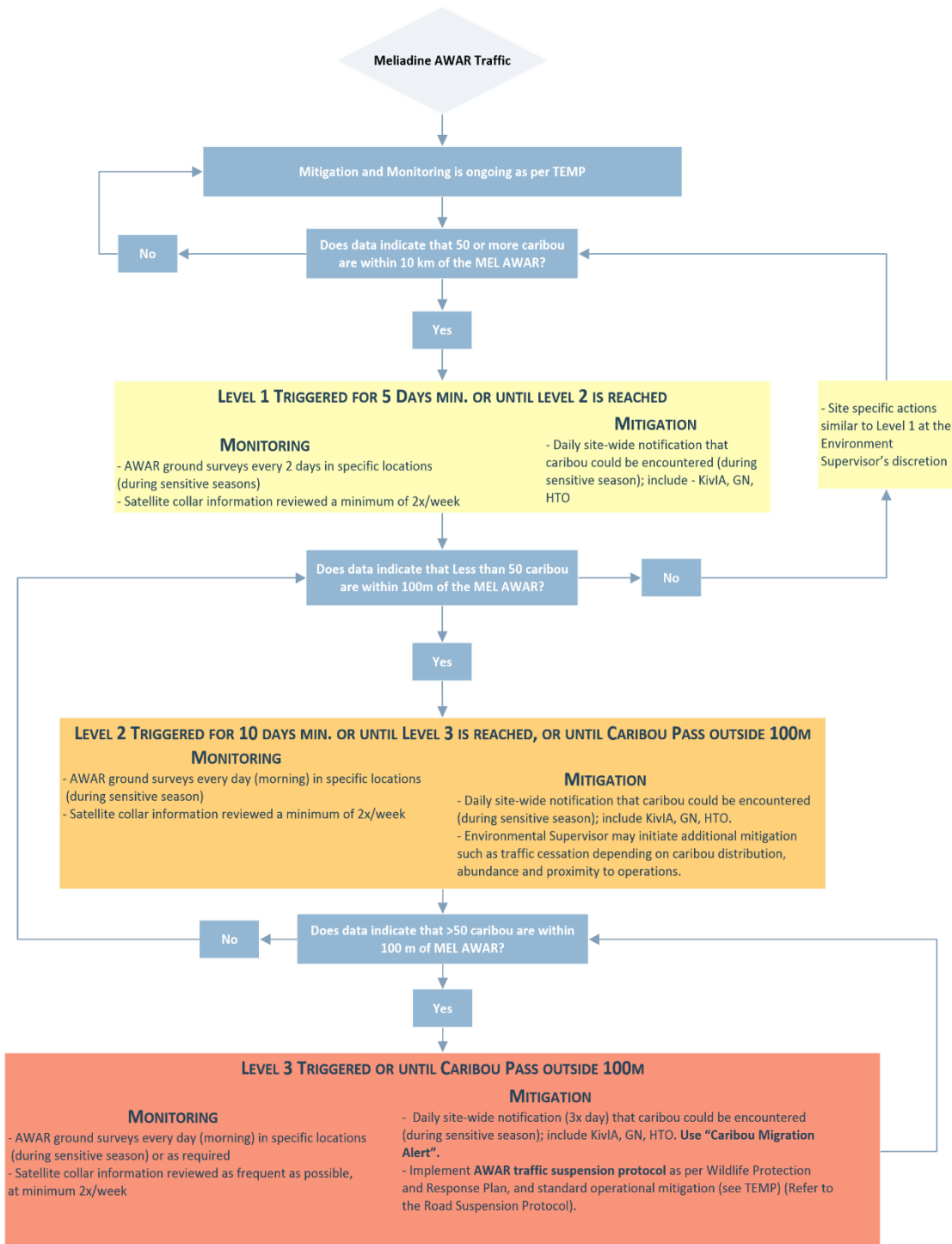
### Related Documentation (If applicable):

- N/A

**References (If applicable):**

- N/A





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Name  
Health & Safety Superintendent / Delegate

**APPENDIX III • WILDLIFE PROTECTION AND RESPONSE PLAN – MELIADINE PROJECT**

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# AGNICO EAGLE

MELIADINE GOLD PROJECT

## WILDLIFE PROTECTION AND RESPONSE PLAN

VER: 8

JANUARY 2019

January 2019

## Document Control

Version	Date (YMD)	Revised by	Section	Page	Revision
August 2012	2012/08/30	David Frenette	2.2.5, 2.2.9.4	7,12	Typo errors (page 7 and 12),
August 2012	2012/08/30	David Frenette	2.2.9.1	11	Precision on the report to send to the authorities during the caribou migration.
November 2012	2012/11/12	David Frenette	2.2.9.1	10	Removal of the 3 monitoring stations as requested by the GN.
June 2013	2013/06/12	David Frenette	App. A	31	Update of the Air Traffic Management Plan
November 2015	2015-11-15	Philip Roy / Jeffrey Pratt	2.2.1	8	Update speed limits
			2.2.7.2	11	Inclusion of wildlife mortality procedure MEL-ENV-0015
			2.2.8.1	12	Update steps for dispatching wildlife on the Meliadine project
			2.2.9	13-16	Comprehensive revision of section 2.2.9 - Protocol for dealing with caribou and muskoxen during their migration
			3.2.2.3	20	Environment department protocol for managing problem predatory mammals
December 2016	2016-12-23	Alexandre Gauthier / Jeffrey Pratt	5.3	30	Delivery of training for site staff
			2.2.9.2		Updated when to activate the work suspension protocol
January 2018	2018-01-20	Alexandre Gauthier	5.3.3		Included Bearwise training outcome
January 2019	2019-01-10	Martin Theriault	App. A and App. D	32	Annual review
					Annual review, Update of the Air Traffic Management Plan and the problem wildlife procedure



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## **SECTION 1 – INTRODUCTION**

This plan proposes mitigation measures and monitoring initiatives to lessen the likelihood that wildlife will become habituated to the Meliadine site and its infrastructures. The plan identifies measures to deter wildlife from obtaining camp food waste, finding shelter around the site, gaining access to harmful substances present on the project site, being injured as a result of vehicle collisions, and damaging mine property.

Despite these mitigation measures, personnel may occasionally come into contact with wildlife that inhabits the Meliadine area. Incidents must be managed to keep both humans and wildlife safe while using only humane control methods.

Furthermore, all staff must be familiar with the standard operating procedures and best practices aimed at ensuring human-wildlife conflicts are minimized during the construction activities. All personnel, including contractors, on site have a role to play in ensuring human safety, conservation of wildlife and documenting wildlife activities in the mine area.

The plan also provides information on general human-wildlife conflict policies and regulations, species-specific response plans for ungulates and predatory mammals, and general wildlife awareness.



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## **SECTION 2 – HUMAN-WILDLIFE CONFLICTS**

### **2.1 Overview**

Wildlife encounters can take many forms. A conflict occurs when either human or wildlife health, and/or safety are put at risk. Human health and safety can be affected by contact or conflict with wildlife in several ways, including direct or indirect physical injury, and exposure to animal diseases that can infect humans (i.e., rabies).

The most common conflict faced by wildlife is the increased risk of mortality from human encounters, which most often occur when wildlife become habituated to human activity and lose their natural fear of people. The most serious form of habituation is directly correlated to animals obtaining food, which is known as food conditioning. Food-conditioned animals become dependent on humans for sources of food. Because these human-induced habits become engrained in the animal, attempts to deter the habituated behavior generally fail with the end result usually being the death of the animal. Loss of habitat effectiveness (how the animal uses its available habitat), and effects to wildlife movement (how the animal travels through its available habitat) can also result from wildlife in conflict with human development. Ultimately, this will affect both the health and safety of the wildlife species involved. While it is impossible to remove all risk to both human and wildlife health and safety, approaches to minimize the risk do exist. Reactive measures do have their place in stopping the conflicts when they occur, but proactive strategies are the most effective means of preventing potential conflicts.

### **2.2 Agnico Eagle Policies and Regulations**

The following summarizes the general rules regarding wildlife on the site and will form the basis of the Wildlife Awareness Orientation and Courses (see below).

Employees and contractors are advised to report all wildlife related activities in the vicinity of the Meliadine site to the Environmental Department.

#### **2.2.1 General Restrictions for Wildlife Protection**

The following are general restrictions for site workers and contractors, intended to minimize the potential for negative project-related effects (e.g., increased mortality risk) on wildlife in and around the site.

- Wildlife shall have the right-of-way except where it is judged to be unsafe to do so. All species of wildlife (i.e., from small mammals to large carnivores, songbirds to raptors) when encountered by personnel on foot or in vehicles will be given the right-of-way,
- Non-mine-registered firearms are not permitted on site,
- Feeding wildlife is prohibited at all times,
- Harassment<sup>1</sup> of wildlife is prohibited at all times at the Meliadine site,

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<sup>1</sup> defined as to kill, injure, seize, capture or trap, pursue and includes to stalk, track, search for, or lie in wait for all purposes not authorized by the Environmental Department



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- The deliberate destruction or disruption of wildlife nests, eggs, dens, burrows, and the like, is prohibited at all times at the Meliadine site,
- Hunting and fishing is prohibited at all times at the site,
- Pets are prohibited at all times at the site,
- Maximum speed limit:
  - On all site roads is 40 km/h.
  - AWA 50 km/hr
  - 20 km/hr around buildings and infrastructure
  - Between camp and mine road is 10km/hr
- Traffic (including ATVs and snowmobiles) is restricted to designated roads and trails.

The site refers to any facility present during the construction and operation phase, including but not limited to, outbuildings (e.g., machine shop, offices), the portal, waste rock pads, parking areas, drill sites, access roads and borrow pits.

### **2.2.2 Wildlife Attractants**

A list of potential wildlife attractants is provided below. The list is intended as a general summary of attractants but may not be comprehensive of all potential attractants.

- Food wastes and garbage;
- Chemicals (e.g., salt for drilling) and refuse (e.g., empty fuel containers);
- Wildlife carcasses (e.g., road kills, hunter kills);
- Human activity moving around the site; and
- Roads, which may create preferential travel corridors for wildlife, can lead to vehicle collisions and increased exposure to wildlife encounters at the site.

### **2.2.3 Garbage Management**

General recommendations directed to minimize wildlife interactions related to food wastes and garbage is provided below.

- Littering is prohibited on and in the vicinity of the site and along access roads. All garbage (e.g. lunch bags) must be returned to temporary storage containers. Note: organic wastes (e.g., orange peels, apple cores, left over coffee, tea or fruit drinks) are included.
- Food related waste (including packaging) will be incinerated on a daily basis and general waste will be stored for disposal in the landfill and then buried.



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- Wastes associated with mechanical maintenance and repairs (e.g., motor oil and antifreeze) will be disposed of as per the Hazardous Materials Management Plan.
- All temporary (small) storage containers for food waste garbage (yellow bin) will be wildlife protective (i.e. have bear proof lids).
- No open top buckets or anything similar will be tolerated outside buildings.
- Feeding wildlife is prohibited at all times on or in the vicinity of the site, including during travel to and from the site on workdays.
- Wildlife incidents related to garbage or human food attractants will be reported as soon as possible. See Section 2.2.7 (Reporting Wildlife Observations and Incidents) for more information.
- Improperly disposed garbage, particularly food wastes will be reported as soon as possible.
- See Section 2.2.7 (Reporting Wildlife Observations and Incidents) for more information.

While arctic fox tends to be the greatest concern with respect to access to garbage, other animals (e.g., wolverines, wolves, grizzly and polar bears) may be attracted to uncontained garbage sources. Problem wildlife data at the Meliadine project to date, indicate that Arctic fox are the most likely species to be attracted to the site.

#### **2.2.4 Wildlife Health**

The following recommendations are intended to reduce potential mine-related effects on wildlife health (including non-vehicle related accidents and consumption of toxic substances).

- Feeding wildlife is prohibited at all times on or in the vicinity of the site, including during travel to and from the site. If caught feeding wildlife, employees will be subject to disciplinary action which could include dismissal.
- Company procedures on the safe and prompt clean-up of any chemical spills will be followed.
- See Meliadine Gold Project's Fuel Transportation and Spill Contingency Plan. Any observations of wildlife in and around potential sources of contaminants (e.g., fueling sites) will be reported. See Section 2.2.7 (Reporting Wildlife Observations and Incidents) for details.

#### **2.2.5 Wildlife and Vehicles**

The following recommendations are intended to reduce the incidence of wildlife-vehicle collisions and near misses.

- Wildlife has the right-of-way except where it is judged to be unsafe to do so.
- Obey all traffic signs.
- Maximum speed limit:



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- On all site roads is 40 km/h.
  - AWA 50 km/hr.
  - 20 km/hr around buildings and infrastructure.
  - Between camp and mine road is 10kmph.
- Verbally report wildlife carcasses observed on and in the vicinity of the site, and along roads, as soon as possible. See Section 2.2.7 (Reporting Wildlife Observations and Incidents) for more information.
- Restrict traffic (including ATVs and snowmobiles) to designated access roads and trails.
- When clearing snow from roads, push the snow with a dozer or blow the snow away with the snow blower to avoid the build-up of snow banks on the side of the road.
- Report all wildlife-vehicle collisions that results in the death or injury of wildlife as soon as possible. See Section 2.2.7 (Reporting Wildlife Observations and Incidents) for details.
- A near miss between a vehicle and an animal should be reported as a wildlife 'incident'. See Section 2.2.7 (Reporting Wildlife Observations and Incidents) for details.

#### **2.2.6 Wildlife and Buildings**

The following recommendations are intended to reduce the risk of close encounters between wildlife and people

- Keep sea-can doors closed at all time to avoid wildlife using them as shelter.
- Open top bins and containers for food waste will not be permitted outside buildings.

#### **2.2.7 Reporting Wildlife Observations and Incidents**

##### ***2.2.7.1 Reporting Requirements of Project Workers and Contractors***

- Workers and contractors are required to verbally notify the Environmental Department of the following wildlife observations or incidents as soon as possible.
  - Signs of animal presence (e.g., scat, nests, burrows) in close proximity (visible to the eye from within the site footprint frequented by workers).
  - Sightings of animals in close proximity (visible to the eye from within the site footprint frequented by workers).
  - Aggressive or unusual wildlife behaviour around site facilities.
  - Instances of workers feeding wildlife.
  - Instances of improper disposal of garbage or other waste materials.
  - Observed maintenance issues (e.g., improper placement or maintenance of garbage containers).
  - Instances of workers not following vehicle use guidelines (e.g. speed limits).
  - Vehicle collisions with wildlife or near misses.



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- Observations and locations of dead (e.g., road kill) or injured animals.

Following the verbal report of a wildlife incident or observation, the Environment Department will complete a Wildlife Incident Report and forward to the authorities as necessary. Wildlife fatality reporting will follow the Wildlife Reporting Protocol (MEL-ENV-0015). This can be found in Appendix B.

#### ***2.2.7.2 Reporting Requirements of Wildlife Occurrences***

Wildlife Incident Reports provide essential information that may identify:

- potentially dangerous situations requiring intervention (e.g., problem wildlife);
- situations that require notification of the Nunavut Department of Environment (GN), KIA and/or the HTO;
- weaknesses in garbage-handling and problem wildlife prevention measures; and
- areas that may require warning signs (e.g., poor visibility road corners).

The Senior Environmental Coordinator or designate(s) should ensure that records of wildlife observations and incidents are thoroughly documented. Reports should attempt to include the following information wherever possible:

- Identification and number of wildlife observed;
- Specific timing and location of the observation(s);
- Details regarding the animal behaviour, including direction of approach and departure, what it was doing, any aggressive behaviour, etc.
- Assessment of local attractants, such as garbage, odours, movement of people, other wildlife, etc.;
- If local attractants are identified as a factor, determination of what steps were or will be taken to address/remove potential attractants; and
- Identification of any potential mitigation measures available to deter wildlife or limit access and how they will be implemented (refer to Section 2.2.8 for additional information on dealing with problem wildlife).

#### **2.2.8 Protocol for Dealing with Problem Wildlife**

A problem wildlife situation may arise when an animal acts in an aggressive manner and/or is a repetitive nuisance or threat to worker safety. See the problem wildlife procedure in Appendix D

##### ***2.2.8.1 Dispatching Problem Wildlife***

1. Prior to dispatching any wildlife on site, the Environment Department will consult with the GN Wildlife Officer for advice/direction. If an animal is destroyed, a description of the lethal measures deployed



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(e.g., rifle), statement of the rationale for use of lethal measures (e.g., proximity to workers, repeated incidents, observed condition of the animal, etc.), and indication of what previous non-lethal measures were employed (e.g., deterrents, hazing, trapping and relocating (with permission from GN) etc.).

2. Written direction (email) from the GN Wildlife Officer must be obtained prior to dispatching any wildlife. The only exception is if there is an immediate threat to human safety (example carnivorous animal is attacking people) Only authorized personnel are permitted to use lethal and non-lethal projectiles (e.g., rubber bullets) see environment department for list of authorized persons on site.
3. Do not attempt to deal with a problem wildlife issue on your own. Problem wildlife can be dangerous.
4. Conform to recommendations regarding predator safety. All staff will receive wildlife awareness training during their orientation.
5. *An animal may be dispatched without consultation with the GN Wildlife Officer only if actions listed in 3.2.2.3 have been followed.*

#### **2.2.9 Protocol for Dealing with Caribou and Muskoxen during their migration**

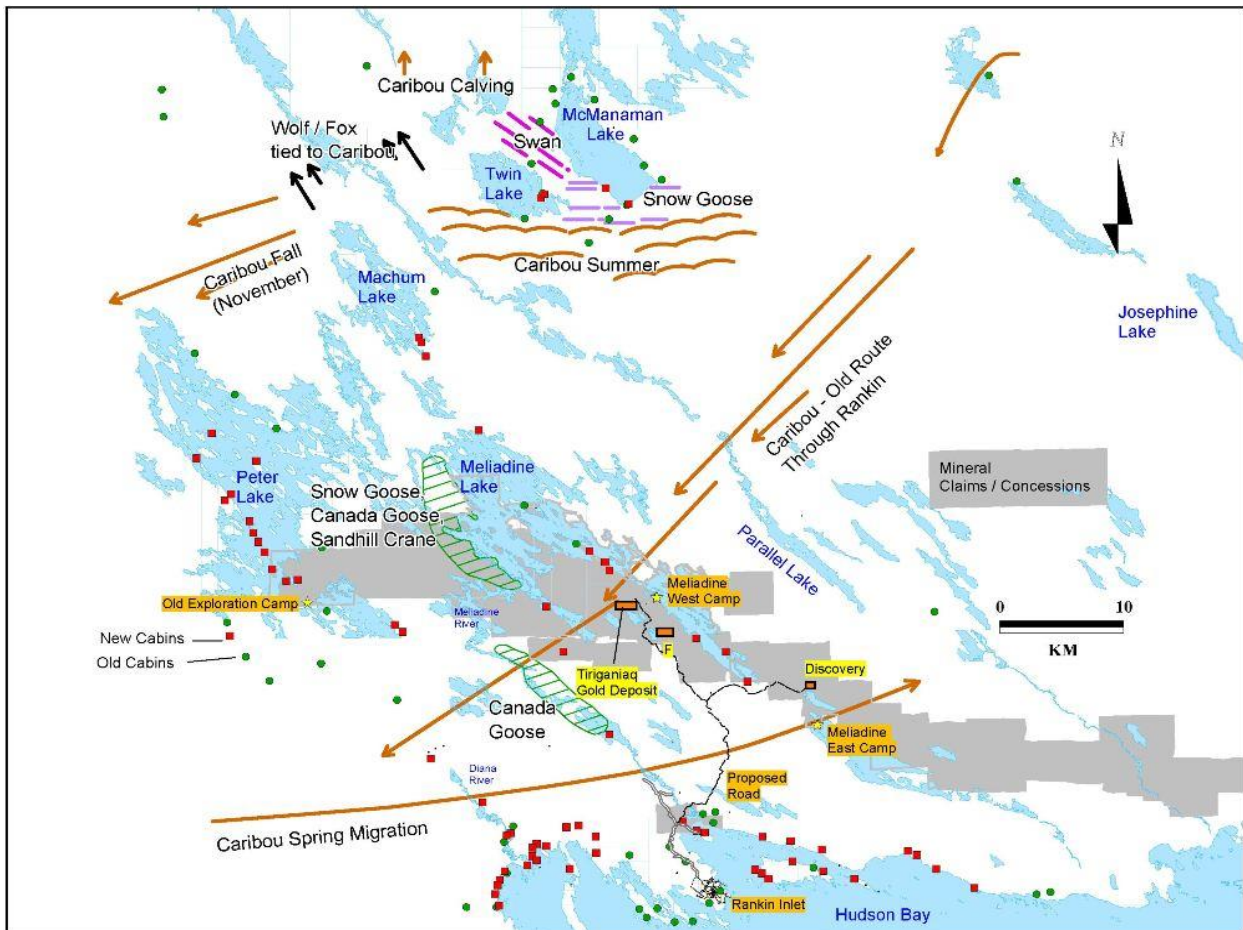
Results from baseline surveys indicate that caribou and, only recently, muskox are present in the Meliadine Area for parts of the four seasons, but caribou are observed in greatest abundance between May and September.

The baseline study established a map of historical wildlife presence in the region of the Meliadine project, including historical migration routes for the caribou. This map is shown in Figure 1.



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Figure: 1 Map of Historical Wildlife Presence in the region of the Meliadine Project



The protocol has 3 components:

- A caribou and muskox herd sighting and protection protocol.
- An activity shutdown protocol including crew change and helicopter flight control.
- An activity restart protocol.

#### ***2.2.9.2 Caribou and muskox sighting reporting and protection protocol***

When the migration starts around the beginning of July, herds of 1000 to 5000 animals (or greater) can cross the area of Meliadine camp. For a period of 3 to 10 days, the caribou may be present around the site for the annual migration. Historically, migrations have been noted between October-December as well.

Studies of woodland caribou have demonstrated avoidance of up to 1 km for well sites and 250 m for roads and seismic lines (Dyer et al. 2001). Data from the Ekati Diamond Mine suggests that the instantaneous



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negative response (alert, stop feeding) of barren-ground caribou to stressors (e.g., truck traffic) increases within 1 km of the source (BHPB 2004).

During this period, Agnico Eagle will report any sighting and prevent human activities that could disturb the herd. Caribou will have the “right-of-way”, and will not be blocked or deterred from moving through the Project area.

AEM must take all possible measures to avoid disturbance to the caribou or muskox herd.

At all times, it's strictly forbidden to harass wildlife. This includes persistently worrying or chasing animals, or disturbing large groups of animals.

**When observing herds of caribou or muskox:**

Staff at Meliadine must report immediately the presence of caribou (50 or more) or muskox (10 or more) to the Environmental Department. The Environment Department will notify the KIA, HTO and the Government of Nunavut Environment Department electronically via a “Caribou Migration Alert” (Section 2.2.9.5)

When reporting the presence of the herd, the location and the approximate size of the herd will be specified.

**When to activate the work suspension protocol:**

During migration of Muskox (10 or more animals) or Caribou (50 or more animals) herds AEM must start implementing the work suspension protocol when the caribou herd is moving in the direction of the activities. In accordance with the IIBA, all off-site and on site-related activities must be stopped once the Herd is within 5 km radius of such activities. Those related activities include; off-site drilling and/or helicopter flight, approved development, construction site development, road traffic and construction; all site, camp, and mine outdoor surface activities. A decision tree was put in place in 2017 to have proper step to follow to activate the work suspension protocol.

***2.2.9.3 Work suspension protocol (in this section we are only listing the activities – the actual stoppage protocol is in A) and B) below***

The activities below could interfere with the caribou migration and will be suspended if necessary:

- Helicopter flights.
- Drill operations off site.
- Surface mining activities such as transportation to mining areas, non-essential refueling of equipment, service vehicle traffic, etc.
- Surface activities related to underground mining such as surface stockpiling of ore or waste with loaders, scoop trams, etc.



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- Surface construction activities such as approved pre-development and development construction, road construction, non-essential waste deposition, transportation of equipment, etc.
- Outside Camp activities.

Upon activation of the work suspension protocol, the following steps will be taken:

#### **A. Drilling and Helicopter Activities Off-Site**

- Inform all employees at the drill sites that are in the direction of the caribou migration and within 5km radius of the migration that they will need to shut down the operations such that the drills and associated helicopter flights can cease as quickly as possible.
- Shutdown will include removal of drill rods from the holes and securing of the drill station.
- Organize transport of the affected personnel to the camp. Personnel that do not require air or road transportation will be requested to walk back.
- During helicopter transport of personnel, the Air Traffic Management Plan (in appendix A) will be applied to protect the caribou herd (avoidance distance of 1,000 m vertical and 1,500 m horizontal).

#### **B. Surface Mining and Construction Activities On Site**

- Surface mining, construction activities, outside camp activities and surface activities related to underground mining as described in Sec 2.2.9.3 above will be stopped when caribou migration herds or muskox herds are within the 5km radius stop work buffer zone.
- All personnel in such cases will return to camp if necessary.
- Use of helicopter for emergency evacuation of personnel for medical reasons will still be allowed.

#### **2.2.9.4 Road utilization**

- For a group of caribou ( $\geq 50$ ) or muskoxen ( $\geq 10$ ) within 100 m from the AWAR road and Meliadine Camp Access road:
  - Regular vehicle traffic for transport to and from the site will be suspended and /or stopped to allow Caribou herds to cross the road.
  - Wildlife has the right of the way and vehicles must wait without disturbing their movements.
  - The use of the road for mining or construction related activities will cease until Caribou or musk ox herds have moved outside the 5km radius stop work buffer zone.

#### **2.2.9.5 Activity Restart Protocol – Caribou Migration Alert**



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- AEM Meliadine Environmental personnel will perform a ground based caribou or muskox survey 3 times per day during the migration. The survey will determine the distance to Meliadine on and off site. The location will be marked on a map depicting the 5km radius buffer zone and the location of the caribou or musk ox herd. As stated previously, all mining related work will cease within the 5km radius stop work buffer zone. Mining, drilling and construction activities as well as the camp will be referenced on the map. Surveys will be conducted,
  - Morning
  - Lunch
  - Evening
- Once the survey is completed, a map noting the herd and proximity of any mining, drilling and construction activities as well as a report containing the following information will be forwarded to all Meliadine Departments, Contractors, KIA, GN, and the local HTO:
  - Where the herd(s) have been observed.
  - Estimated number of animals in the area.
  - Where activities can resume.
  - Where activities are suspended.

This will be referred to as a “**Caribou Migration Alert**”

- No work will resume in a suspended/stop work zone until the next survey can verify that the herds are outside the 5km radius zone. An example of a Caribou Migration Alert can be found in Appendix C



## **SECTION 3 – SPECIES-SPECIFIC RESPONSE PLANS**

### **3.1 Purpose**

Response plans specific to species groups (i.e., ungulates and predatory mammals) are required to ensure that all personnel at the Meliadine site are provided guidance on how to respond in a manner that is safe to both humans and wildlife should they encounter wildlife on or around the project site.

### **3.2 Species Groups Addressed**

Ungulates (caribou and muskoxen) and predatory mammals (polar and grizzly bears, wolverine, wolf and Arctic fox) have the highest potential for interactions with humans during the life of the mine, and thus require specific response plans. If other wildlife is encountered, adaptive management strategies will be implemented if mitigation techniques and the mine policies and regulations mentioned in this document are not effective for these species. The proposed wildlife monitoring program will be the best measure of identifying potential areas in need of new mitigation strategies, or changes in policies or regulations.

For each of the species groups described below, the seasonal activity in the project area is discussed, as well as the protocol in the event of an encounter.

#### **3.2.1 Ungulates**

##### ***3.2.1.1 Seasonal Activity in the Project Area***

Results from baseline surveys indicate that caribou and, only recently, muskoxen are present in the Meliadine area for part of the four seasons, but caribou are observed in greatest abundance in the spring (e.g., July) when thousands of animals may be present in the vicinity of the Meliadine site. This only occurs annually.

##### ***3.2.1.2 Response to Encounters***

###### **3.2.1.2.1 Caribou**

It is extremely rare for humans to have physical altercations with caribou. Caribou rut in the fall when relatively low numbers can be found from time-to-time on the site and the levels of aggression displayed, particularly by males, increases substantially. There is literature suggesting that a bull caribou may attack a person or vehicle during the rut. Therefore, a close encounter with caribou (during the fall) or muskoxen could be dangerous.

If you encounter a single or herds of caribou, the following actions should be taken:



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- Back away slowly;
- Ensure animal(s) have an escape route;
- Do not make sudden movements;
- Do not make loud noises or attempt to scare the animal(s);
- Use radio/satellite phone to report presence of the animal(s) to the Environmental Department;
- Stay in radio/phone contact until the animal(s) moves away or you have returned to a safe area;
- (e.g. inside vehicle or building); and
- Wait for the animal(s) to pass before continuing work in the area.

#### **3.2.1.2.2 Muskox**

Although considered rare, muskoxen will charge humans if they are threatened (especially lone bulls). Being a sedentary species, the muskoxen will have the tendency to stand their ground when threatened, defending their territory or their young.

If you encounter a single or herds of muskoxen the following actions should be taken:

- Back away slowly;
- Ensure animal(s) have an escape route;
- Do not make sudden movements;
- Do not make loud noises or attempt to scare the animal(s);
- Use radio/satellite phone to report presence of the animal(s) to the Environmental Department;
- Stay in radio/phone contact until the animal(s) moves away or you have returned to a safe area
- (e.g. inside vehicle or building); and
- Leave the area and wait for the animal(s) to go away before continuing work in the area.

### **3.2.2 Predatory Mammals**

#### ***3.2.2.1 Seasonal Activity in the Project Area***

##### **Polar and Grizzly Bear**

Baseline surveys indicated limited use of the Meliadine study area by grizzly bears, which is consistent with what would be expected for grizzly bears in the north, given their wide-ranging habits and low densities. Polar bears are more commonly seen of late. **These are extremely dangerous under all circumstances as they are known to prey on humans. Get help immediately if you see a polar bear.**



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### **Wolverine**

Wolverines are thought to occur in the project area on an infrequent basis. Records of wolverine sightings or their sign were not found since baseline studies began in 1998. Similar to grizzly bears, the limited evidence for wolverine in the area is not surprising given their wide-ranging movements and characteristically low population densities.

### **Wolf**

A single wolf was seen one time during the years of baseline studies. They are not common in the study area.

### **Arctic Fox**

Camp personnel have regularly observed Arctic foxes in and around the Meliadine site during most months of operation, including winter. Arctic foxes are the most common predatory mammal species to be encountered at the Meliadine mine.

#### ***3.2.2.2 Response to Encounters***

Predatory mammals such as wolves, wolverine, arctic fox and bears rarely attack people; however, they are extremely strong and vicious, and should be given respect. **Polar bears are known to attack humans.** Members of the dog family (such as wolves and foxes) are more at risk of carrying rabies, and other zoonotic diseases, and therefore should be avoided. Arctic fox in particular is easily tamed, quickly losing their fear of humans and often approaching very close. Sick or injured animals may no longer be able to feed themselves, and could be in a state of starvation. Often they show few physical signs that something may be wrong, but typically act more aggressively or even 'friendly' towards humans. Therefore, a close encounter with a predatory mammal could be dangerous. All bites and scratches from wildlife should be reported immediately to Health & Safety since animals can be vectors for rabies.

#### ***If you encounter a predatory mammal, the following actions should be taken:***

- Back away slowly and do not turn your back on the animal;
- Do not make sudden movements;
- Do not make loud noises or attempt to scare the animal if it is simply traveling through the area;
- Use radio/satellite phone to report the presence of the animal to the Environmental department;
- Stay in radio/phone contact until the animal moves away or you have returned to a safe area. (e.g. inside vehicle or building); and
- Wait for the animal to pass before continuing work in the area.



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***If the predatory mammal does not back away, or shows interest in you:***

- Continue to back away slowly and ensure a 10 m distance between yourself and the animal;
- Make sure the animal has a safe route of escape;
- Make noise to alert the animal of your presence or to scare it off;
- Avoid provoking it;
- Return to a safe area as soon as possible (e.g. inside a building or vehicle); and
- Keep the Environmental department informed of situation using the radio/phone.

***If the predatory mammal still does not back away, call for deterrent action by the Environment***

***Department***

The Environment Department is to treat all predatory mammals that are threatening or aggressive as they would treat a grizzly bear or polar bear, which are perceived to be most dangerous. All predatory mammals that are showing interest in a person or site facilities must be aggressively deterred to prevent habituation to the site. Detailed response recommendations are provided in Section 3.2.2.3 below. If an animal is not of an immediate safety concern, the Environment Department should discuss options to deter or remove the animal with Government of Nunavut conservation personnel.

***3.2.2.3 Environment Department Protocols for Managing Problem Predatory Mammals***

As part of the detailed response plan, the Environment Department will follow the procedures included here when responding to predatory mammal sightings and encounters. It is assumed that the reporting person(s) has followed procedures for predatory mammal incidents, and has requested the Environment Department to be dispatched due to the failure of human presence to deter the predatory mammal. If an animal is not of an immediate safety concern, the Environment Department should discuss options to deter or remove the animal with Government of Nunavut conservation personnel. All wildlife problems are to be recorded in the wildlife database.

**The Environment Department will:**

- Collect all deterrent equipment and receive briefing from the Senior Environmental Coordinator or designate on location and circumstances of the call.
- When firearms are to be used there will always be two individuals, one person with a firearm (12 gauge) for deterrent use, the other as back up having a rifle with lethal force or a 12 gauge with lethal rounds. No lethal force will be taken without consent from the Senior Environmental Coordinator or designate in conjunction with the consultation of the Government of Nunavut Wildlife Officer unless the situation is deemed to be life threatening.



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- The appropriate action, usually less than lethal deterrent, will be chosen and used in an effort to scare the predatory mammal away.
- If the deterrent is successful, the incident will be recorded in the Wildlife database and should detail the type and level of deterrent used, information on the predatory mammal involved, and all information on the circumstances leading up to the incident.

***If the deterrent is not effective and the predatory mammal continues to approach or doesn't move away from the area of human activity or project footprint.***

- Increase deterrent efforts to less than lethal projectile (rubber bullet) if not already being employed.
- Ensure the animal has an open escape route.
- Continue aggressive use of less than lethal projectile deterrents to try and chase the animal away.

### **Dispatching**

All but the most aggressive animals should have been deterred at this point. If the situation escalates further the Senior Environmental Coordinator, Superintendent or designate must be contacted and made aware of the situation. No Further action will be taken until consultation with the GN Wildlife Officer has been completed.

NO LETHAL ACTION WILL BE TAKEN UNTIL CONSENT IS GIVEN BY GN WILDLIFE OFFICER.

**The following will be determined by the Environmental Superintendent or designate in conjunctions with the H&S Superintendent and the Mine Manager or designate; any and all possible actions will be taken to communicate with the GN wildlife officer prior to making an internal decision.**

***The risk to human life or property is imminent since the predatory mammal has not responded to non-lethal deterrent options and the safety of the team or site property is now compromised.***

- Shoot with the intention of stopping the threat, using buckshot or 1-ounce lead slugs or with the .300 calibre rifle as appropriate, to kill the animal.
- Shots should be aimed at the chest area, not the head or hind quarters.
- If lethal force has been used, the Environment Department must complete a full report detailing the event immediately.
- The GN conservation officers will be notified by phone. Direction will then be given to properly dispose of the carcass.
- Any wildlife showing signs of rabies will be dispatched (never shot in the head) and reported.

NOTE: Lethal action against any wildlife without consent from the GN Wildlife Officer can result legal ramifications. As well, unnecessary deterring of wildlife can be considered harassment and can also result in legal ramifications. The only exception is if there is an immediate threat to human safety (example carnivorous animal is attacking people), however even at this point approval from Environmental Superintendent or designate in conjunctions with the H&S Superintendent and the Mine Manager or designate must be obtained.



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Any AEM employee who does not follow the above mentioned steps **will be** subject to disciplinary measures.



## **SECTION 4 – WILDLIFE AWARENESS INFORMATION AND ENCOUNTER STRATEGIES**

This section deals with general predatory mammal (ie. Wolves, wolverines, grizzly bears and polar bears) awareness information and encounter strategies. It does not replace the need for all personnel to take a recognized wildlife awareness course.

### **4.1 Factors that Influence a Predatory Mammal's Reaction**

Wolverines, wolves, grizzly bears and polar bears will react differently to chance encounters with humans, depending upon many factors, including each animal's past experience with humans. Their reaction is difficult to predict because of the variability of factors with each encounter.

- Female mammals may aggressively defend her young (for example, female bears with cubs are more likely to attack than to flee).
- Wolverines or bears may defend a food cache (for example, a bear's main objective is to eat from the time it leaves its den to the time it returns to a winter den. Hunting bears will cache food after eating part of it by covering the food with dirt, branches or leaves. They will often establish a daybed nearby and return later for another meal). Animals will aggressively defend their food cache.
- Individual Space: All predatory mammals have a minimum distance surrounding them within which any intrusion is considered a threat. A cornered or surprised predatory mammal may be dangerous. If there is no cover to retreat to, their usual response to danger is to attack or to stand its ground.
- Old, wounded or predatory mammals with teeth malformations can be dangerous because they are very hungry or starving (e.g. wolves observed at the Meadowbank site in 2009)
- Wolverines, wolves, artic fox and bears are easily attracted to human food sources and may become aggressive to obtain it. Predatory mammals that have obtained food from humans become "human food habituated." These mammals are accustomed to humans and link people as sources for obtaining food.
- Young animals which are inexperienced hunters and/or recently weaned are also at a greater risk to take advantage of human food source opportunities.



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## **4.2 Animal Encounters**

Most of animal safety is prevention – avoiding an encounter is the best way to stay safe while working in the home ranges of arctic fox, wolverines, wolves, and grizzly bears. Polar Bears are incidental to Meliadine as they wander inland from the shoreline in search of food. **Polar bears are extremely dangerous and help should immediately be sought.**

## **4.3. How to React to Animal Encounters**

Your reaction should depend on circumstances and the behavior of the mammal.

1. Stop and assess the situation before you act.
2. Does the wolverine, arctic fox, wolf or bear know you are there?
3. How is the animal reacting to the nearby activity?
4. Remain calm.
5. Do not turn your back on the animal.

**DO NOT RUN** – You will trigger the animal's natural response to chase you. Wolverines, wolves and bears are extremely fast and you cannot outrun them.

### **Some Simple Rules:**

- Respect them – they can kill you.
- Be alert at all times.
- Watch for signs.
- Make noise – don't surprise animals.
- Travel in groups when possible.
- Be cautious in noisy areas (streams).
- Know the types of areas animals use during the year.
- Do not approach them.
- Never feed them.
- Get trained and carry deterrents.
- Remember carcass equals danger – look for ravens, strong odours.
- Mentally rehearse encounters.



#### **4.3.1 Specific situations: Animal Encounters**

##### ***Wolverine, wolf, or bear is not aware of you:***

- Leave the area quietly in the same direction that you came from.
- Move while the predatory mammal is not aware of you and stop moving when the mammal lifts its head to check its surroundings.
- Stay downwind so the wolverine, wolf or bear will not pick up your scent.
- When you have moved a safe distance away and preferably to your truck or shop where you can watch and wait until the predatory mammal leaves.
- Report event to Environmental department immediately

##### ***If the wolverine, wolf or bear is unaware of you and approaching:***

- Allow the mammal the right of way. Make sure there is a safe escape route and that you are not in the way.
- Return to vehicle or building when available or allow animal a wide berth.
- Report event to Environmental department immediately.

##### ***If you cannot leave undetected:***

- Move upwind so animal can pick up your scent; this will help them identify you as human.
- If possible, try to keep the predatory mammal in your sight.
- Watch to see if the predatory mammal leaves when it smells that a person is nearby.
- Report event to Environmental department immediately.

##### ***If the wolverine, wolf or bear is aware of you but in the distance:***

- Continue walking at the same general pace and towards a safe area (vehicle or building).
- **DO NOT RUN.**



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***The wolverine, wolf or bear is aware of you and close:***

- A predatory mammal will feel threatened in a close confrontation. Generally, their natural tendency will be to reduce or to remove the threat. Assist the wolverine, wolf or bear by acting as non-threatening as possible.
- Do not make direct eye contact.
- Do not make any sudden moves.
- Do not run.
- In the case of a bear, they need to identify you as a person, so talk in low tones and slowly wave your arms over your head.
- Attempt to give the wolverine, wolf or bear an opportunity to leave. Be sure they have an open escape route.
- Try to back away slowly.
- If the mammal begins to follow you, drop your jacket, or pack or some other article (not food) to distract the wolverine, wolf or bear. This may distract the bear long enough for you to escape.
- Report to Environmental department immediately

***The wolverine, wolf or bear is close and threatening:***

- If you have a deterrent such as a bear banger or bear spray be prepared to use it depending on how close the predatory mammal is.
- If you do not have a deterrent, or if using the deterrent is not successful, act as non-threatening as possible.
- Talk to the predatory mammal in a calm authoritative tone of voice.
- Do not startle or provoke the predatory mammal by making sudden moves.
- Back slowly away from the wolverine, wolf or bear and drop a pack, jacket, or some other article in order to distract the mammal momentarily.
- Remember that the wolverine, wolf or bear may be defending their cubs that you have not yet seen or they may have a food cache nearby. Attempt to look as non-threatening as possible.
- Report to Environmental department immediately

***The wolverine, wolf or bear is very close and approaching:***

A distance of less than 50 meters in an open area is considered very close.

- If the predatory mammal continues to approach use your deterrent when in range.
- If the predatory mammal does not respond to the deterrent you must now **STAND YOUR GROUND!**
- Report to Environmental department immediately



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***The wolverine, wolf or bear charges:***

In the case that you have done something that has provoked the wolverine, wolf or bear into showing signs of aggression towards you. It is often not clear to the person what they have done to provoke the mammal until after the attack. It is important that you act passively, humble your posture and do not look directly at the wolverine, wolf or bear. Always keep the mammal in sight. Never yell or throw things as these are obvious signs of aggression

**When faced with a charging wolverine, wolf or bear:**

- First use your deterrent, either a banger or pepper spray. If authorized (only Environment Department representatives or local security personnel) to carry a firearm, shoot the predatory.
- **DO NOT PLAY DEAD IF THE PREDATORY MAMMAL CONSIDERS YOU FOOD.**
- You must defend yourself with whatever means are available, act aggressively towards the bear.
- Stand up on something high and try to make yourself look bigger. Try to appear dominant. Try to frighten it. Yell, scream, shout and wave your arms. Jump up and down and fight back.
- Hold your jacket or backpack over your head to make yourself look bigger
- If being aggressively attacked in a predatory attack, fight back. Concentrate your efforts on the face, eyes and nose of the bear. Use whatever means you have, rocks, sticks, tools, hardhat, or simply kick and punch with all the strength you can muster.
- Report to Environmental department immediately

***There are two types of bear attacks***

**Provoked Attacks:**

- You have done something that has provoked the bear into showing signs of aggression towards you. It is often not clear to the person what they have done to provoke the bear until after the attack.
- It is important that you act passively, humble your posture and do not look directly at the bear. Always keep the bear in sight.
- Lie down on the ground in the prone position (i.e. play dead as this is a sign of submission to the bear and shows the bear that you are no longer a threat to them).
- Never yell at the bear or throw things at the bear, these are obvious signs of aggression towards the bear.
- Report to Environmental department immediately

**Predatory Attacks:**



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- The bear is hunting or stalking you! You are being treated as potential food. DO NOT PLAY DEAD IF THE BEAR CONSIDERS YOU FOOD
- You must defend yourself with whatever means are available, act aggressively towards the bear. Stand up on something high and try to make yourself look bigger.
- Try to appear dominant. Try to frighten the bear. Yell, scream, shout and wave your arms. Jump up and down and fight back. Hold your jacket or backpack over your head to make yourself look bigger.
- Use your deterrent; either a banger or pepper spray.
- If deterrent is unsuccessful. only as an absolute last resort, and If authorized to carry a firearm, shoot the bear.
- Report to Environmental department immediately

#### **4.4 Wildlife Deterrents**

##### **4.4.1 Noise**

- Pyrotechnics, including bangers, screamers, whistlers and flares. Requires a magazine launcher.

##### **4.4.2 Wildlife chemical Deterrents**

Bear Sprays are highly effective but they must be used correctly to be effective. As with all deterrents they have their good points and their bad points.

- The main ingredient in bear spray is “Capsicum” an extract from hot peppers.
- Capsicum needs to strike the eyes, nose or mouth of the mammal, (open membranes) to be effective.
- These sprays can only be used at very close range, 3 to 8 m or 10 to 25 ft.
- You cannot discharge the bear spray too early – or it will be completely ineffective.
- If the predatory mammal comes within the range of the bear spray – aim directly into their face and spray.
- You must be aware of the wind direction. If you the wind is blowing towards you, the spray will be carried by the wind into your face.
- Bear spray may not be effective in sub-zero weather. (Spray cans do not fire well in very cold temperatures.) In colder weather you need to keep the can of bear spray warm in order for it to fire effectively.
- Bear spray will not be effective in the rain. When you fire a can of bear spray, the spray will create a billowing cloud of capsicum and propellant. Rain can/will wash the spray right out of the air before it strikes the bear in the face.
- If you have used your can of bear spray to deter a mammal, wash the nozzle off with soap and water to remove the scent. Replace your can of spray as soon as possible. You do not want to have another bear encounter with a half a can of spray left.
- Bear sprays have a shelf life. Always replace your bear spray when you are nearing the end of the shelf life. The Capsicum does not deteriorate over time; it is the canister seals that deteriorate over time.



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- Do not test your can of spray before going out into the field. You need to take a full can of spray into the field, not a partially used one.

Wildlife chemical deterrents are only to be used for the purpose they are intended for. Misuse of wildlife deterrents such as chemical sprays, bangers, and pyrotechnics is considered a criminal offence.



## **SECTION 5 – TRAINING PROTOCOL**

### **5.1 Scope**

The Wildlife Training Protocol outlines recommended levels of training that specific groups of people at the Meliadine division site should receive. It is important that human activity at the site does not result in wildlife encounters that put people or wildlife at risk. All personnel on site have a role to play in ensuring human safety, conservation of wildlife, and documenting wildlife activities in the project area.

### **5.2 Assumptions and Key Considerations**

Meliadine will assign overall accountability, recording and reporting responsibility to the Senior Environmental Coordinator or designate(s).

The Senior Environmental Coordinator or designates (s) will be responsible for ensuring that all employees, contractors and visitors at the Meliadine Division receive wildlife training appropriate to their roles and responsibilities.

The Environment Department will be responsible for all deterrent action whenever it is necessary to deter wildlife from mine infrastructure or personnel. All members of the Environment Department will receive specialized training in various levels of deterrent use. Security personnel and the Environment Department will be the only onsite personnel to have access to a firearm.

### **5.3 Training**

Mandatory wildlife awareness for all staff will be included in the site induction, toolbox meetings, and through print media.

#### **5.3.1 Wildlife-Human Conflict**

- General restrictions for wildlife protection.
- Wildlife Attractants.
- Garbage Management.
- Wildlife Health.
- Wildlife and Vehicles.
- Preventing Problem Wildlife.
- Dealing with Problem Wildlife.
- Reporting Wildlife Observations and Incidents.



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### **5.3.2 Wildlife Awareness Training**

This training will be aimed at providing awareness of potential wildlife encounters that may occur at the Meliadine Project. The course should review:

- Wildlife that commonly occur near the site.
- Behavior of wildlife that may be encountered near the site.
- Wildlife encounters.
- Wildlife Deterrents.

### **5.3.3 Environment Department**

In addition to the required site orientation, the Environment Department may require additional training. The following training is recommended, especially for those without experience in situations where wildlife occurrences are common.

#### ***Bear Safety Training***

Provided by qualified contractor or Territorial, Provincial or Federal Wildlife Officer, this course will provide:

- Instruction on the use of lethal and non-lethal deterrents for emergency response to bear incidents;
- Techniques for euthanizing bears during an emergency response;
- Other types of deterrent options available in non-emergency situations;
- In depth aversive conditioning techniques; and
- Practicum.

The Meliadine environmental Department and workers depicted on the MEL-ENV-0007 Use of Firearm procedure have all been trained by the Bearwise trainer; Andy McMullen in 2016 and 2017.

A Bearwise audit of Meliadine site was completed in 2016 and significant improvements were realized compare to 2012. The report mentioned that Meliadine site had developed effective and practical solutions to challenges as they arose over time. The efforts of all departments and employees to make the Meliadine operation safe for both people and wildlife are to be commended.

#### ***Carnivore Safety Training***

Provided by qualified contractor or Territorial, Provincial or Federal Wildlife Officer to include:

- Biology, ecology and behavior of wolverine, wolf, Arctic fox;
- Rabies and other zoonotic diseases;
- Detailed deterrent and aversive conditioning techniques;



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- Instruction on the use of lethal and non-lethal deterrents for emergency response to incidents involving large carnivores; and
- Practicum.



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## **Appendix A – AIR TRAFFIC MANAGEMENT PLAN**



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**DATE: April 10, 2018**

**TO: All helicopter and fixed wing aircraft pilots operating near the Meliadine site**

**RE: Air Traffic Management Procedure**

**FROM: Environment Department**

Please be advised that AEM is required to implement an air traffic management procedure in the immediate vicinity of the Meliadine Project. The primary objective of this procedure is to minimize to the greatest extent possible all potential impacts to wildlife from low flying aircraft and helicopters.

AEM asks that all pilots of helicopter and fixed wing aircraft abide this procedure when flying to/from the Meliadine Project or in the vicinity of the project area wherever possible (from a safety perspective).

- For long-range transportation flights (i.e. to and from Rankin Inlet), we ask all pilots to follow a practice that sees the aircraft fly at a minimum of 650 m above ground level. Exceptions may exist during takeoff and landing, low-level ceiling conditions, high winds, or other risks to flight safety.



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- For relatively shorter transportation flights, we ask that all pilots follow a practice that sees all aircraft (including helicopters) flying at a minimum of 300 m above ground level. Exceptions may exist during takeoff and landing, low-level ceiling conditions, high winds, or other risks to flight safety.
- The Environment Department must be notified if caribou, muskox or other animals are within 1 km of the landing area. The pilot should establish a radio contact on the Meliadine designated camp aircraft frequency and request that the camp radio operator call out the wildlife team to herd animals away from the strip/pad before landing.
- At remote landing areas, we ask that helicopters not land within 1 km of individual or large aggregations of wildlife.
- We ask that when flying over observed large concentrations of caribou (50 or more individuals in close proximity to one another), large concentration of muskoxen (10 or more individuals) or large concentration of migratory birds, to respect a 1,100 m vertical and 1,500 m horizontal distance from the herd whenever possible. We ask that all pilots avoid helicopter flights over known areas of raptor nests, snow geese during their moulting period (from July to August), waterfowl and shorebird staging areas during critical seasons (when birds are present –spring and summer months). The Environment Department can and should inform pilots of these areas. If maintaining this altitude is not possible, maintain a lateral distance of at least 1,500m from key sites.
- Harassment of wildlife (flying below 300 m), especially grizzly bear, muskoxen, caribou, wolves, and wolverine, is expressly forbidden. Exceptions exist only in the rare instance the animal(s) poses an immediate danger to a person in the field.
- Please report any wildlife sighting to the environment department.
- The Iqalugaarjuup Nunanga park is located between the Meliadine camp and Rankin Inlet. To minimize impact on the wildlife and the park's visitors, the pilots shall avoid to flight over or to land in the vicinity of the park. Emergency flights, specifically medical evacuation flights and/or search and rescue overflights are excepted from adherence to this requirement.

Please be also advised that AEM is required that a daily log or record of flight paths and cruising altitudes of aircraft within all Project areas is maintained and made available for regulatory authorities such as Transport Canada to monitor adherence and to follow up on complaints.



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Thank you for helping AEM protect the natural resources of Nunavut and for helping demonstrate that mineral exploration and mining can co-exist with the wildlife and population without causing a significant adverse impact.

***Pilot name :***

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***Date:***

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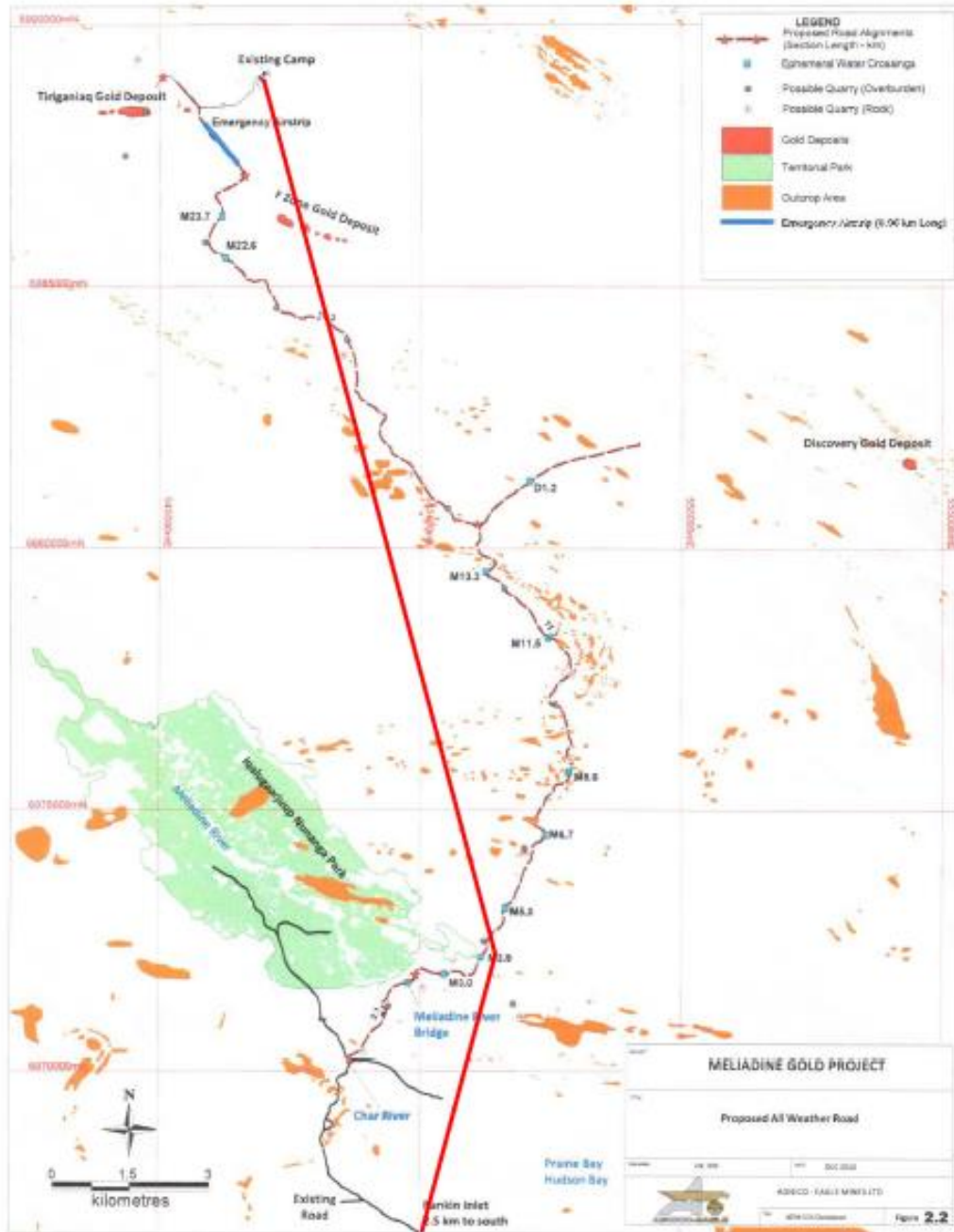
***Signature:***

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***Agnico Eagle Mines Ltd. Exploration division***



## Air traffic path between Rankin Inlet and Meliadine camp



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## **Appendix B – MEL-ENV-0015**



# Wildlife Fatality Reporting



**DOCUMENT ID: MEL-ENV-Wildlife reporting**

**People concerned: Meliadine Environment Dept.**

**Effective Date: 2018-03-08**

*This procedure corresponds to the required minimum standard. Each and everyone also have to comply with the rules and regulations of the Nunavut Government in terms of health and safety at work.*

Rev #	Date	Description	Initiator
1	2018-03-08	Change to intelx template	Alexandre Gauthier
2	2018-03-27	Review	Matt Gillman

## Objective:

- To ensure that the Meliadine site follows the proper procedure for reporting Wildlife fatalities, to uphold the IIBA agreement and Management plan obligations.

## Definitions (If applicable):

- None

# Wildlife Fatality Reporting



Tool/Equipment Required	PPE Required
<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>

Specific Training Requirements
<ul style="list-style-type: none"> <li>None</li> </ul>

<ol style="list-style-type: none"> <li>1. Upon receiving information of a wildlife fatality or upon observing a wildlife fatality during an inspection; a Problem Wildlife Report shall be generated. A blank report form can be located at <a href="#">\\Camefs02\groups\Environment\WILDLIFE\Wildlife Reports\Form\2016 AEM Meliadine Problem Willidfe Report template V 1xls.xls</a></li> <li>2. The carcass of the animal should then be moved to a location that will not attract carnivorous' animals, for the interim.</li> <li>3. At this point, the GN wildlife officer in Rankin Inlet will need to be contact via telephone for a verbal report and to receive direction on how the carcass will be disposed of.  Please follow procedure MEL-ENV-0021 located at:<a href="#">\\Camefs02\groups\Environment\MANAGEMENT PLANS &amp; PROCEDURES\Procedures\MEL-ENV-0021 - Problem Wildlife Procedure\MEL-ENV-0021 - Problem Wildlife Ver1.pdf</a></li> <li>4. Upon receiving direction from the GN wildlife officer on disposal or transfer method, follow through with directions given. Add the disposal or transfer method to the report generated in step #1.</li> <li>5. The report can now be sent for review by SR. Coordinator Compliance Counselor.</li> </ol>

6. Upon review a final version can be made and saved in PDF. The PDF should now be sent to the Compliance Counselor for distribution to GN, KIA, and HTO. As well a copy should be saved for the annual report.

## Related Documentation (If applicable):

- Wildlife management plan

## References (If applicable):

- None

# Wildlife Fatality Reporting



## Appendix (If applicable):

- None

## Authorization (Print Name)

Approved: \_\_\_\_\_ Date: \_\_\_\_\_  
 Name  
 JOHSC Worker Rep.

Approved: \_\_\_\_\_ Date: \_\_\_\_\_  
 Name  
 Department Superintendent / Delegate

Approved: \_\_\_\_\_ Date: \_\_\_\_\_  
 Name  
 Health & Safety Superintendent / Delegate

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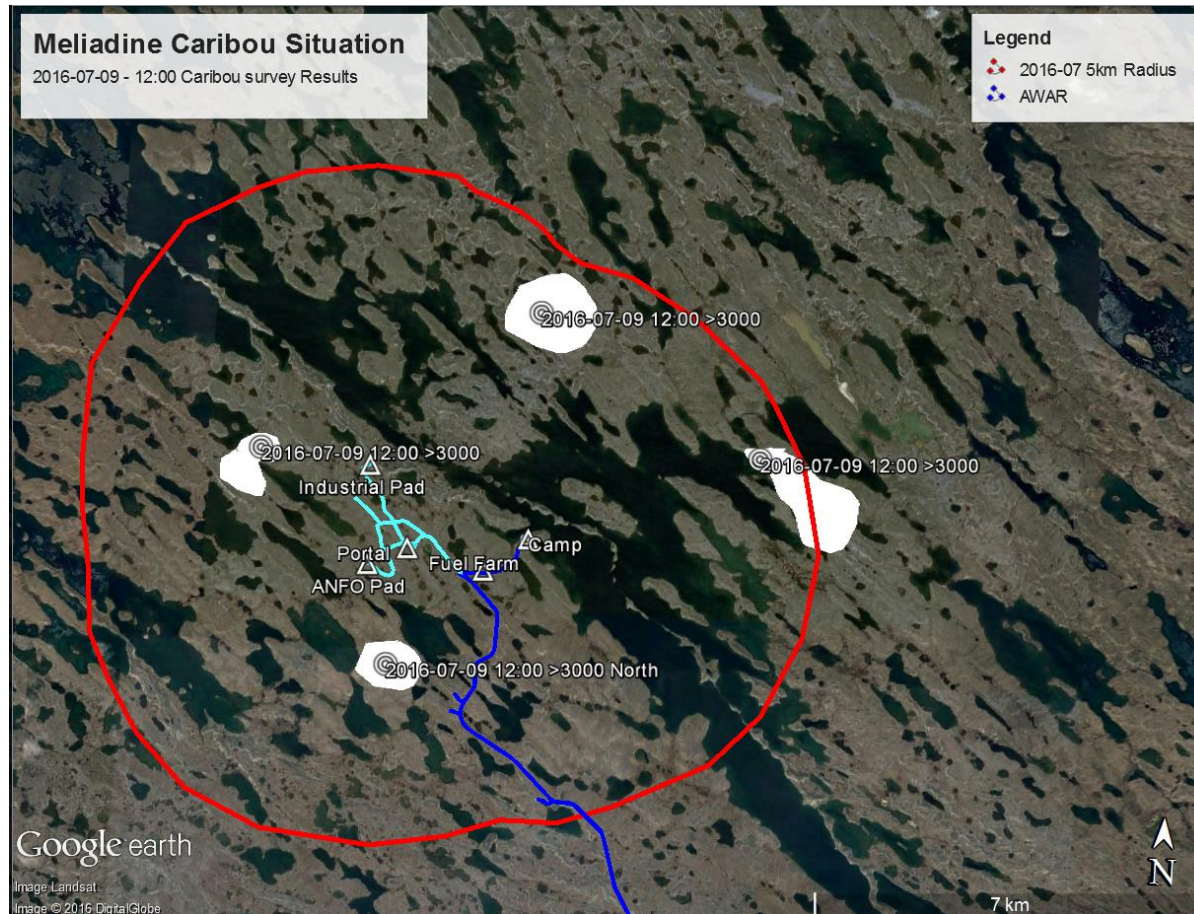
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## **Appendix C – MIGRATION ALERT**



# “CARIBOU MIGRATION ALERT” NOTIFICATION

## 2016-07-09 (12h00) Meliadine Caribou Situation



**Figure 1:** Caribou survey, results for July 9<sup>th</sup> 12h00. 4 groups over 3000 caribou have been observed going within the 5 km protection zone

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## **Appendix D – MEL-ENV-0021**



**DOCUMENT ID: MEL-ENV-Problem Wildlife**

**People concerned: Agnico Eagle employees, contractors, visitors on the Meliadine site**

**Effective Date: 2018-11-13**

*This procedure corresponds to the required minimum standard. Each and everyone also have to comply with the rules and regulations of the Nunavut Government in terms of health and safety at work.*

Rev #	Date	Description	Initiator
1	2018-03-09	Change to intellex template	Alexandre Gauthier
2	2018-03-27	Review	Matt Gillman
3	2018-11-13	Communication for Polar Bear observation and required equipment	Martin Theriault

## Objective:

- To define the procedure which must take place when dealing with problem wildlife on the Meliadine mine site and associated facilities.
- Problem Wildlife: any wildlife that; have entered buildings or structures, have shown signs of aggression towards employees or equipment, are showing signs of human habituation.  
\*\*\*Any large predators observed on the Meliadine site should be treated as potential "problem wildlife"

## Definitions (If applicable):

The following procedure is to mitigate the risk of conflict between employees and wildlife at the Meliadine site and to ensure that all actions regarding problem wildlife are done in accordance to our Wildlife Management Plan and that the GN Wildlife Department are kept informed.

Tool/Equipment Required	PPE Required
<ul style="list-style-type: none"> <li>Bear spray</li> <li>Rifles equipped with live ammunition <ul style="list-style-type: none"> <li>Tikka T3 0.300 cal. bolt action rifle</li> </ul> </li> <li>Firearm equipped with noise making ammunition or rubber bullets <ul style="list-style-type: none"> <li>Stoeger Double Defence 12GA coach gun</li> <li>Remington 870 12GA pump action shotgun</li> <li>Benelli Nova 12GA pump action shot gun</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Regular PPE</li> </ul>

Specific Training Requirements
<ul style="list-style-type: none"> <li>Firearm License</li> <li>Bearwise training</li> </ul>

<p><b>1.Procedure</b></p> <p><b>1.1</b> On-site personnel who encounter problem wildlife including large carnivore are required to notify the Environment Department immediately.  *any wildlife not deemed problematic, under the definition outlined above, are not required to be reported directly to the Environment Department, but are required to be noted on the wildlife logs located in various locations around camp.</p> <p><b>1.2</b> The Environment Department staff will document all reported sightings of wildlife on the Meliadine project and provide the information to the Government of Nunavut Conservation officer(s) in Rankin Inlet as part of the monthly Wildlife Report.</p> <p><b>1.3</b> In the case that there is a recurring sighting of a particular animal including large carnivores in the vicinity of the camp or work areas, the environmental staff shall inform the Environmental Coordinator and/or General Supervisor</p>

**1.4** The Environmental Coordinator and/or General Supervisor will then contact the Government of Nunavut Conservation officer(s) in Rankin Inlet to inform them of the recurring problem.

Contact will be made via telephone to the Rankin Inlet GN Wildlife Office. If the officers cannot be reached at the office then a call will be placed to the cellular phone numbers provided below. For each number called, if there is no answer, leave a message for the officer(s). In addition, a follow-up email must be sent to the officers' email address to ensure there is a documented form of communication. All documented communication must be provided to the Compliance Counselor for reporting purposes.

**1.5** Any further action will be at the discretion of the Wildlife officer.

**\*\***Under no circumstances will any action be taken outside of what the Wildlife Officer has advised, unless approved in writing or via email by the Environmental Superintendent and the General Manager (or designate).

**1.6** If the problematic animal continues to be present; return to step 2.4 and repeat until issue is resolved with the problematic animal of concern.

**\*\***The harassment or intentional dispatching of any wildlife on the Meliadine site without written permission can result in disciplinary actions.

*Exception:* If an animal is, without a doubt, threatening the safety of a person or is of immediate concern, the dispatching of an animal would be approved without consent provided by GN Wildlife Officers and Environmental Superintendent. In such a case, approval must still be gained by the designated Environmental Manager and acting Meliadine Manager. The dispatching of any animal must be performed by an individual whom is approved to use a firearm under procedure MEL-ENV-0007.

**1.7** A full report of activities and actions will be required for any issues regarding problem wildlife. A template for the Problem Wildlife Report can be found at

[\\Camefs02\groups\Environment\WILDLIFE\Wildlife Reports\Form\2016 AEM Meliadine\\_Problem Wildlife Report\\_template V 1.xls.xls](\\Camefs02\groups\Environment\WILDLIFE\Wildlife Reports\Form\2016 AEM Meliadine_Problem Wildlife Report_template V 1.xls.xls)

## **2. Communication for Polar Bear Observation**

**2.1** Notify the Environment Department immediately.

**2.2** Notification will be sent by the Environmental Coordinator and/or General Supervisor by e-mail to all employees including contractors and a radio notification will also be done on the camp channel.

**2.3** Environmental Coordinator and/or General Supervisor and Environment Technician will keep a radio until the issue is deemed safe. Environment staff will patrol the area to assess whether it is safe.

**2.4** Security officer may guard the main door from the main camp and ensure no one goes out of the main camp until the Environmental Coordinator and/or General Supervisor give the authorisation

**2.5** All supervisors are responsible to advise their employees to ensure proper precautions are taken. No outside work will be allowed until the situation is deemed safe

**2.6** Environment Team will monitor the situation and only the Environmental Coordinator and/or General Supervisor will be allowed to give the clearance.

## **November 2018 - GN Wildlife Officer Contact Information**

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Wildlife Management Division – Department of Environment  
Government of Nunavut  
**Polar Bear Line for Rankin Inlet**  
  
**867-645-2222**

## Related Documentation (If applicable):

- Wildlife Management Plan
- MEL-ENV-Wildlife Procedure

## References (If applicable):

- None

## Appendix (If applicable):

- None

## Authorization (Print Name)

Approved: _____ <div style="text-align: center;">Name JOHSC Worker Rep.</div>	Date: _____
Approved: _____ <div style="text-align: center;">Name Department Superintendent / Delegate</div>	Date: _____
Approved: _____ <div style="text-align: center;">Name Health &amp; Safety Superintendent / Delegate</div>	Date: _____

**APPENDIX IV • VEGETATION HEALTH PROGRAM – TERMS AND CONDITION 38 AND 39**

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## APPENDIX V – CONDITIONS 38 AND 39

**TO** Stephane Robert, Josee Brazeau, Ryan Vanengen  
Agnico Eagle Mines Ltd.

**DATE** November 20, 2015

**CC**

**FROM** Corey De La Mare, Lasha Young  
Golder Associates Ltd.

**PROJECT No.** 1535029 - 2000

### **NIRB PROJECT CERTIFICATE NO.: 11MN034 – CONDITIONS 38 AND 39**

## **Introduction**

In October 2014, the Nunavut Impact Review Board (NIRB) issued their Final Hearing Report for Agnico Eagle Mines Ltd. (Agnico Eagle) Meliadine Gold Project (the Project). This report presents the procedural timeline for the Project and concerns heard from Inuit communities, interveners (e.g., Kivalliq Inuit Association) and the board itself. Consequently, NIRB developed 127 Terms and Conditions that are to be implemented by the Proponent and/or interveners, where warranted.

This memorandum addresses Condition 39, which requires details for the implementation of a vegetation health program within 6 months of issuance of the Project Certificate. Condition 39, described below, is also closely related to Condition 38, which relates to metals found in soils in areas with berry-producing plants. As a result, both Conditions will be addressed through a combined program and the background information related to these topics and the proposed sampling program are described in this memorandum.

## **NIRB Conditions**

Term and Condition Numbers 38 and 39 from Project Certificate No. 11MN034 as issued by NIRB for the Project are as follows:

- **38 (To assess the impact of the Project on berry-producing plants):** The Proponent (Agnico Eagle) shall conduct sampling to determine baseline levels for metals in soils found in areas with berry-producing plants near the Project area, and shall update relevant vegetation sections with the Terrestrial Management and Monitoring Plan (TEMMP) to incorporate ongoing monitoring of these parameters prior to commencing operations.
- **39 (To monitor metal levels in vegetation):** The Proponent shall develop and establish an on-going monitoring program to determine the distribution, abundance, and health of vegetation species used as caribou forage (such as lichens) near Project areas, prior to commencing operations.

## **Background and Rationale**

Some metals in trace amounts (i.e., boron, chlorine, copper, iron, manganese, molybdenum, and zinc) provide essential sources of nutrients to many organisms, including plants and animals (Pais and Jones 1997). However, a large number of metal elements are known to have adverse or toxic effects on plant or animal tissue at high concentrations depending on the nature of the metal, environmental conditions, and the species affected (Pais and Jones 1997; Kabata-Pendias 2001). In some cases, certain plant species may accumulate toxic elements or compounds, but the rate and effectiveness by which plants uptake nutrients and trace elements, including metals, is quite variable (Greger 2004).



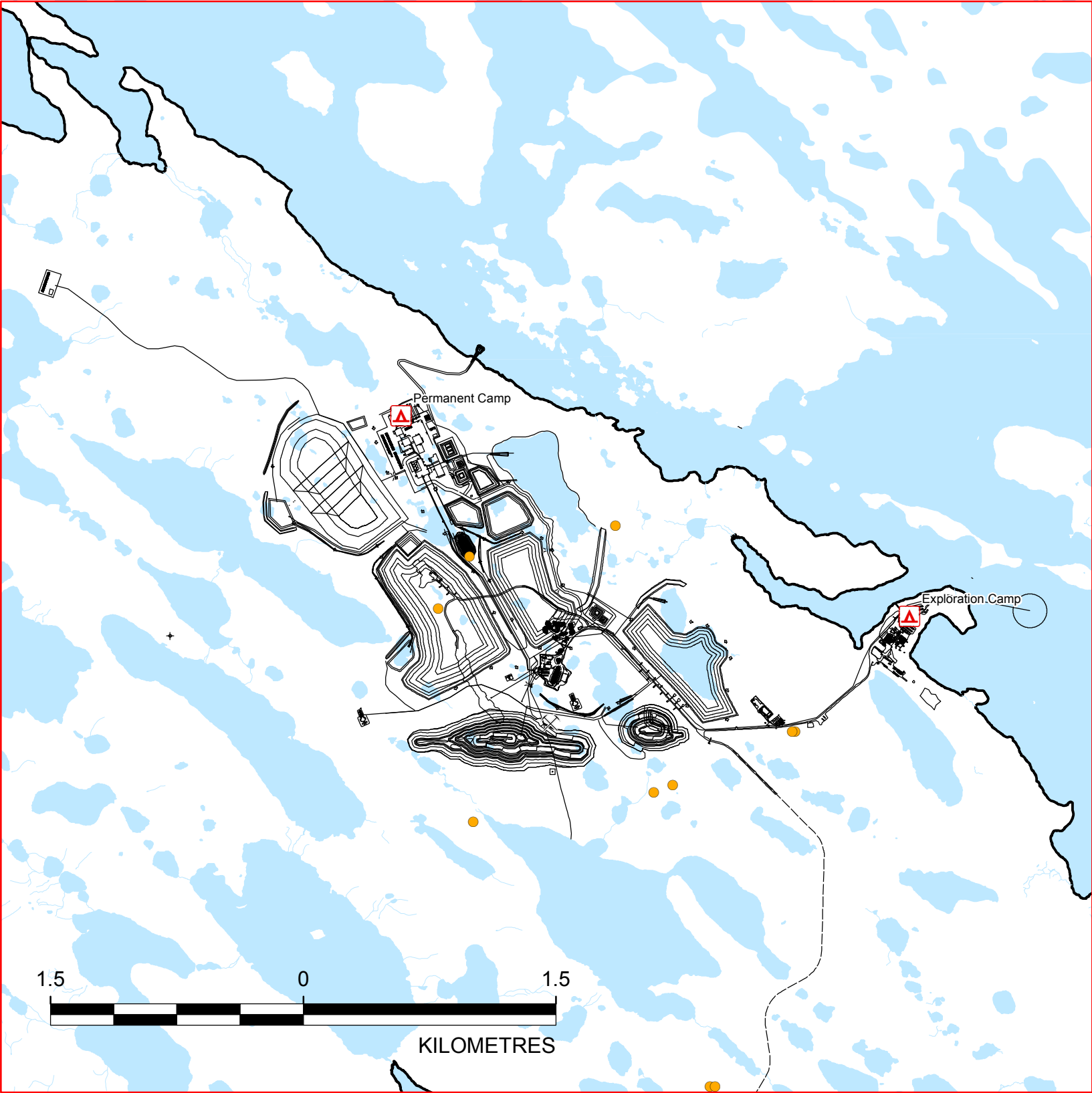
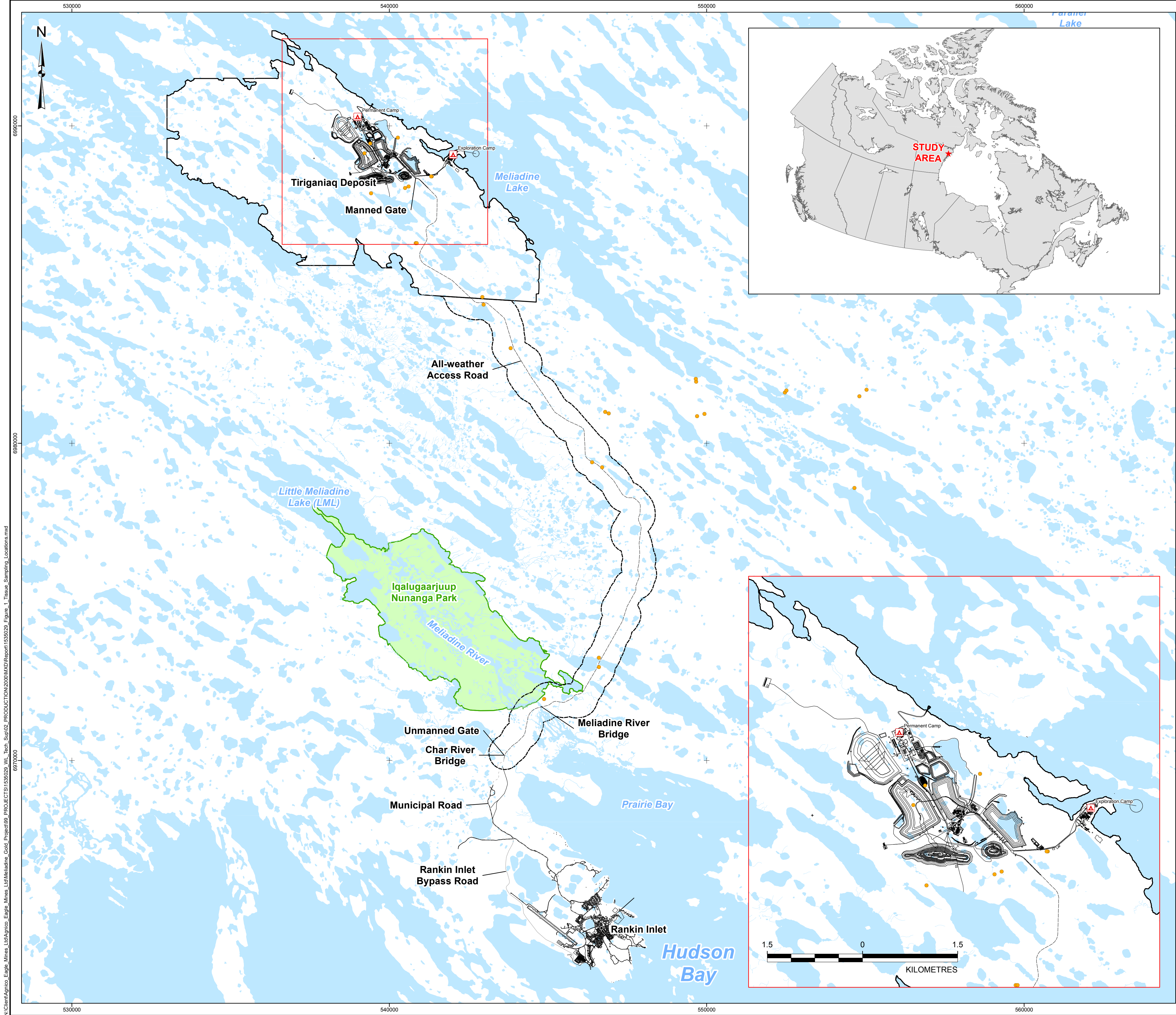
Generally, the uptake of metals in plants occurs from the soil matrix via the roots or from the atmosphere through direct absorption through the leaf cuticle (Kabata-Pendias 2001). Absorption of metals from the soil matrix requires that metals be present in solution for them to be taken up by plants (Greger 2004). The availability of metals is governed by soil properties like moisture, pH, and organic matter content. The result is that soils containing higher amounts of organic matter, clay content, and pH levels will typically bind metals to the soil matrix making them unavailable for uptake by plants (Greger 2004). Plant uptake of metals through the leaves can occur through deposition of dry materials (i.e., dust or airborne particles containing metal elements) or wet materials (i.e., precipitation containing metal ions in solution) (Greger 2004). In most cases, uptake of toxins in plant tissues is proportional to availability in the surrounding environment (Greger 2004).

To effectively assess the potential effects of dust borne contaminants containing metals originating from a proposed road sites and mine, it is critical to have a good understanding of the baseline concentration of metals. Consequently, Agnico Eagle (formerly Comaplex) undertook metals sampling in soils (related to Condition 38) and plant tissues (related to Condition 39) in 2008 and 2009. Establishing a baseline sampling program for estimating background concentrations of metals in soils and plant tissues provides a basis for evaluating potential effects and for implementing a monitoring program to assess changes to metal concentrations in plant tissue and soils over the duration of the Project.

### Baseline Methods

Baseline metal concentrations in plant tissue and soil in the Local Study Area (LSA) undertaken in the fall of 2008 and completed in the fall of 2009 are provided in SD 6-2 Terrestrial Vegetation and Wildlife Baseline Synthesis Report Meliadine Gold Project, Nunavut, submitted in support of the Final Environmental Impact Statement (Agnico Eagle 2014). Sample sites were selected to represent the range of vegetation types in the vicinity of the proposed mine site and road. Seventeen permanent sampling sites were established in the vicinity of the proposed mine site and along the proposed all-weather road, and an additional 12 sites were established along the road to the Discovery area (Figure 1), which is no longer being considered as part of the first phase of development for the Project. All sites were permanently marked with a metal stake and a tag denoting the site name, as well as a painted rock, and GPS waypoints were obtained. These sites were established as permanent plots that can be re-visited as part of a project monitoring program.

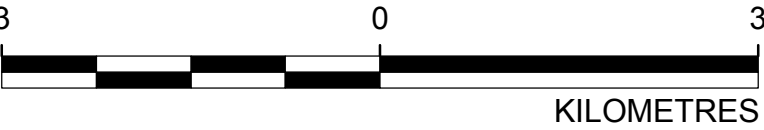
Tissue samples from at least 2 different plant species and a soil sample were collected from each site. Two equal sub-samples of soil were taken from the rooting zone and combined into one composite sample of approximately 200 g. Plant species for tissue analysis were selected based on their relative abundance in the area and their relative importance to human or wildlife consumption. The species selected for tissue analysis are summarized in Table 1.





**LEGEND**

- SOIL AND PLANT TISSUE SAMPLING PLOT
- CAMP
- PROPOSED MINE SITE
- ALL-WEATHER ACCESS ROAD (AWAR)
- ROAD - NEW
- ROAD - EXISTING
- WATERCOURSE
- LOCAL STUDY AREA - MINE
- LOCAL STUDY AREA - ROAD
- WATERBODY
- TERRITORIAL PARK

**REFERENCE**  
BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED.  
DATUM: NAD83 PROJECTION: UTM ZONE 15



PROJECT		 <b>AGNICO EAGLE</b>		AGNICO EAGLE MINES LIMITED MELIADINE GOLD PROJECT NUNAVUT	
TITLE					
<b>SOIL AND PLANT TISSUE SAMPLING LOCATIONS - 2008 AND 2009</b>					
PROJECT		1535029		FILE No.	
DESIGN	CD	13 Nov. 2015	SCALE AS SHOWN		REV. 0
GIS	CDB	13 Nov. 2015			
CHECK	JR	17 Nov. 2015			
REVIEW	CD	17 Nov. 2015			



<b>FIGURE: 1</b>	
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**Table 1: Plant Species Selected for Metal Concentration Baseline and Monitoring in 2008 and 2009**

Scientific Name	Common Name
<b>Shrubs</b>	
<i>Arctostaphylos alpina</i>	Alpine manzanita
<i>Betula nana</i>	Swamp birch
<i>Empetrum nigrum</i>	Black crowberry
<i>Ledum palustre</i> ssp. <i>decumbens</i>	Marsh Labrador tea
<i>Salix planifolia</i>	Tealeaf willow
<i>Salix lanata</i> ssp. <i>richardsonii</i>	Lanate willow
<i>Vaccinium uliginosum</i>	Alpine blueberry
<i>Vaccinium vitis-idaea</i>	Mountain cranberry
<b>Forbs</b>	
<i>Oxytropis arctica</i> var. <i>bellii</i>	Bell's Point-vetch
<b>Grasses and Sedges</b>	
<i>Carex aquatilis</i>	Water sedge
<i>Carex misandra</i>	Shortleaf sedge
<i>Poa</i> sp.	Bluegrass
<b>Non-vasculars</b>	
<i>Aulacomnium</i> sp.	n/a
<i>Flavocetraria nivalis</i> (formerly <i>Cetraria nivalis</i> )	Crinkled snow lichen

n/a = not applicable

Only healthy plants were collected; plant specimens with obvious signs of disease, such as yellowing leaves, holes in leaves, or lack of foliage were not collected. Leaves and new growth were obtained from all woody plants by taking cuttings from the tips of the plants and placing samples in a Ziploc bag, while all above ground tissues of forbs and grasses were collected and placed in Ziploc bags. Non-vascular plants were collected from the ground surface and placed in a Ziploc bag. Composite tissue samples for each species were taken from collected plant materials.

All plant tissue and soil samples were frozen in the field and later transported to ALS Laboratories for subsequent metals analysis. Plant tissue samples collected in 2008 were analyzed using Inductively Coupled Plasma Mass Spectrometry (ICPMS) for 28 metals (Table 2), and the Metals-Canadian Council of Ministers of Environment (CCME) package was used to assess for 19 metals in the soil samples (Table 2). In 2009, plant tissues and soil samples were analyzed for metals using the Inductively Coupled Plasma Optical Emission Spectrometry (ICPOES) and ICPMS packages (Table 2).



## APPENDIX V – CONDITIONS 38 AND 39

**Table 2: Selected Metals Assessed in Plant Tissue and Soil Samples in 2008 and 2009**

<b>2008 Plant Tissue (mg/kg)</b>	<b>2008 Soil Matrix (mg/kg)</b>	<b>2009 Plant Tissue (mg/kg) and Soil Matrix (mg/kg)</b>
Aluminum (Al)	Antimony (Sb)	Aluminum (Al)
Antimony (Sb)	Arsenic (As)	Antimony (Sb)
Arsenic (As)	Barium (Ba)	Arsenic (As)
Barium (Ba)	Beryllium (Be)	Barium (Ba)
Beryllium (Be)	Cadmium (Cd)	Beryllium (Be)
Cadmium (Cd)	Chromium (Cr)	Bismuth (Bi)
Calcium (Ca)	Cobalt (Co)	Cadmium (Cd)
Chromium (Cr)	Copper (Cu)	Calcium (Ca)
Cobalt (Co)	Lead (Pb)	Chromium (Cr)
Copper (Cu)	Mercury (Hg)	Cobalt (Co)
Iron (Fe)	Molybdenum (Mo)	Copper (Cu)
Lead (Pb)	Nickel (Ni)	Iron (Fe)
Magnesium (Mg)	Selenium (Se)	Lead (Pb)
Manganese (Mn)	Silver (Ag)	Lithium (Li)
Mercury (Hg)	Thallium (Tl)	Magnesium (Mg)
Molybdenum (Mo)	Tin (Sn)	Manganese (Mn)
Nickel (Ni)	Uranium (U)	Mercury (Hg)
Phosphorus (P)	Vanadium (V)	Molybdenum (Mo)
Potassium (K)	Zinc (Zn)	Nickel (Ni)
Selenium (Se)		Phosphorus (P)
Silver (Ag)		Potassium (K)
Sodium (Na)		Selenium (Se)
Strontium (Sr)		Sodium (Na)
Thallium (Tl)		Strontium (Sr)
Tin (Sn)		Thallium (Tl)
Titanium (Ti)		Tin (Sn)
Vanadium (V)		Titanium (Ti)
Zinc (Zn)		Uranium (U)
		Vanadium (V)
		Zinc (Zn)

### Baseline Results

Metals concentrations for the collected soil samples were assessed relative to the CCME (2007) criteria for contaminated soils to determine if any metals exceeded acceptable limits for agricultural sites under the existing baseline conditions. The soil quality guidelines for agricultural sites were used, as the site in its current state is considered unaltered at baseline.



The majority of soil metal concentrations in 2008 sample plots were within acceptable guidelines, with the exception of Arsenic (As), which exceeded CCME limits on 10 plots (Appendix A Table A-1). Most of these plots were found in the immediate vicinity of the proposed Meliadine main site or along the proposed road near the main site. The exception was plot 08-015, which was located southwest of the main mine site near the proposed Discovery area road. One plot, 08-010, had borderline values for Arsenic at 11.8 mg/kg. Cobalt (Co), Copper (Cu) and Selenium (Se) also exceeded CCME agricultural criteria on 2 sites (Table 4-10). Soil plot 08-002 had high levels of copper and selenium, whereas plot 08-005 had levels of cobalt and copper above CCME criteria. Both sites are located near the proposed Meliadine main mine site.

For the 2009 samples, only soil plots 09-D02 and 09-D08 had elevated levels of Arsenic (As) at 12.6 mg/kg and 20 mg/kg respectively, compared to the CCME guideline value of 12 mg/kg (Table 4-11). All other soil metal concentrations in the 2009 sample plots were below applicable CCME guidelines (Table 4-11).

### Plant Tissue Metal Concentrations

Metal concentrations in tissue from selected plant species were also analyzed to provide an understanding of baseline levels of various metals that may be concentrated in plant tissue. The results of the plant tissue metals analyses for 2008 and 2009 indicate that there was a wide variability in the range of metal concentrations (Appendix B, Tables B-1 and B-2). Alpine manzanita and snow lichen tissue were found to have some of the highest concentrations of Aluminium (Al) and Iron (Fe) in both 2008 and 2009 sample plots, with black crowberry also showing high levels of Aluminium (Al) in the 2009 plots. In the 2008 samples, Nickel (Ni) concentrations were found to be highest in *Oxytropis arctica* var. *belli*, whereas flat-leaved willow and mountain cranberry had some of the highest levels for Zinc (Zn) and Manganese (Mn), respectively Appendix B, Table B-1. This is in contrast to the 2009 samples taken along the proposed Discovery Road alignment, which showed high levels of nickel Appendix B, Table B-2. The highest levels of arsenic were found in alpine manzanita, along with water sedge on 2 plots located near the proposed Meliadine main site (Appendix B, Table B-1).

Observed metal concentrations reflect naturally occurring levels. While there is no known literature available on the levels of metals that would be toxic to the plant species selected, at the time of sampling, there were no indications of disease or toxicity symptoms observed in the areas studied, with some rare exceptions of a fungus infection called “rust” affecting swamp birches. This condition is seen throughout the mainland arctic (P. Burt, 2008, pers. comm.), and is not particular to this area.

### Future Sampling Program

The baseline metals sampling program setup in 2008 and 2009 were designed to characterize the metal concentrations in soils and plant tissues located in close proximity to proposed Project infrastructure, as designed at that time. Subsequently, the mining footprint has altered and Phase 1 of the Project is in the water licencing phase. The future sampling program will consist of sampling locations stratified as follows:

- On-site – these locations will be in immediate proximity to Project infrastructure (e.g., All Weather Access Road [AWAR], open pits, waste rock storage areas, borrow pits and quarries, among other)
- Near-site – areas downwind of dust deposition but not immediately adjacent to infrastructure to determine if there are far-field effects (i.e., outside of immediate anticipated influence of the Project); and
- Reference – areas outside the influence of the Project representing natural conditions.

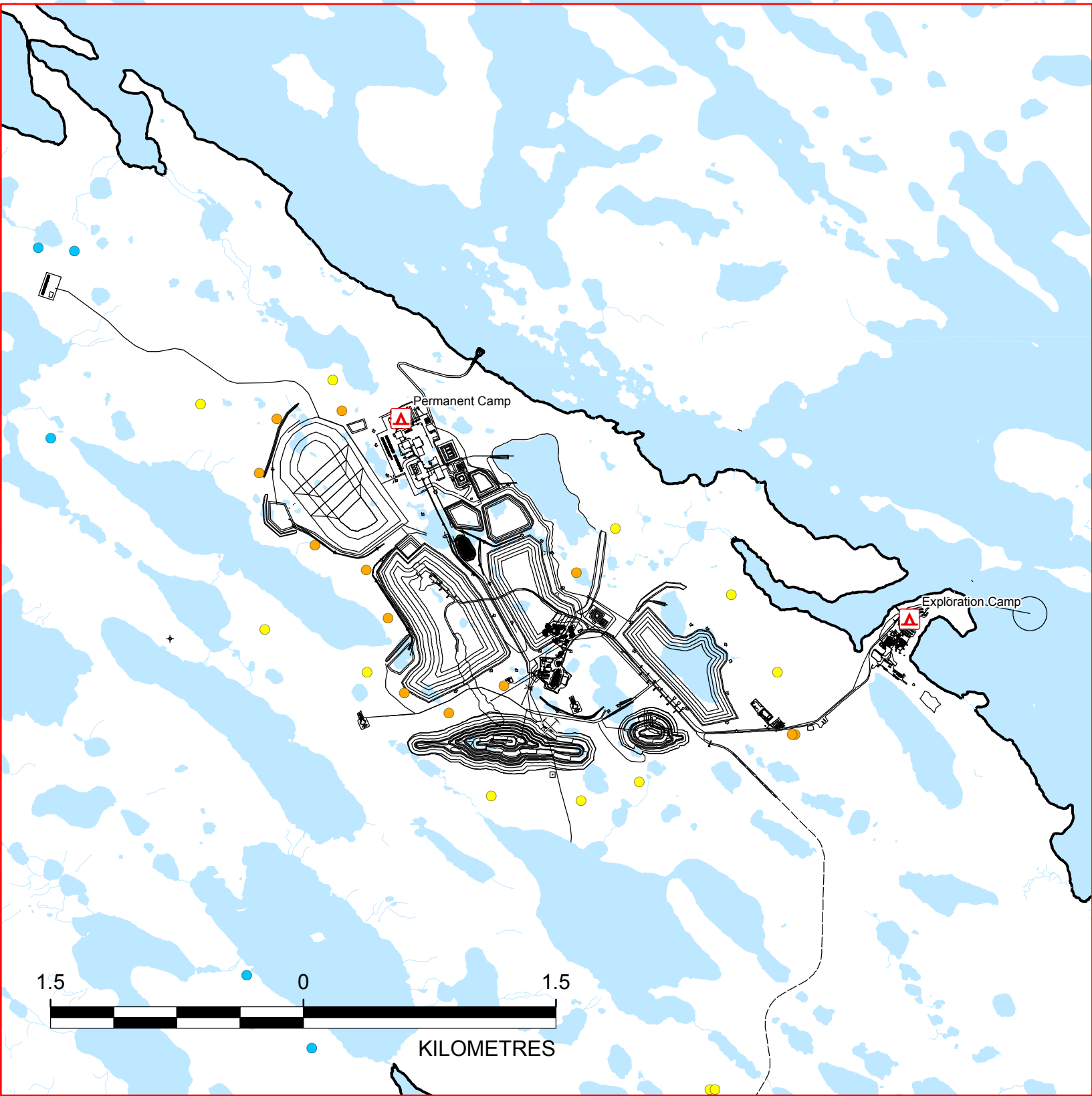
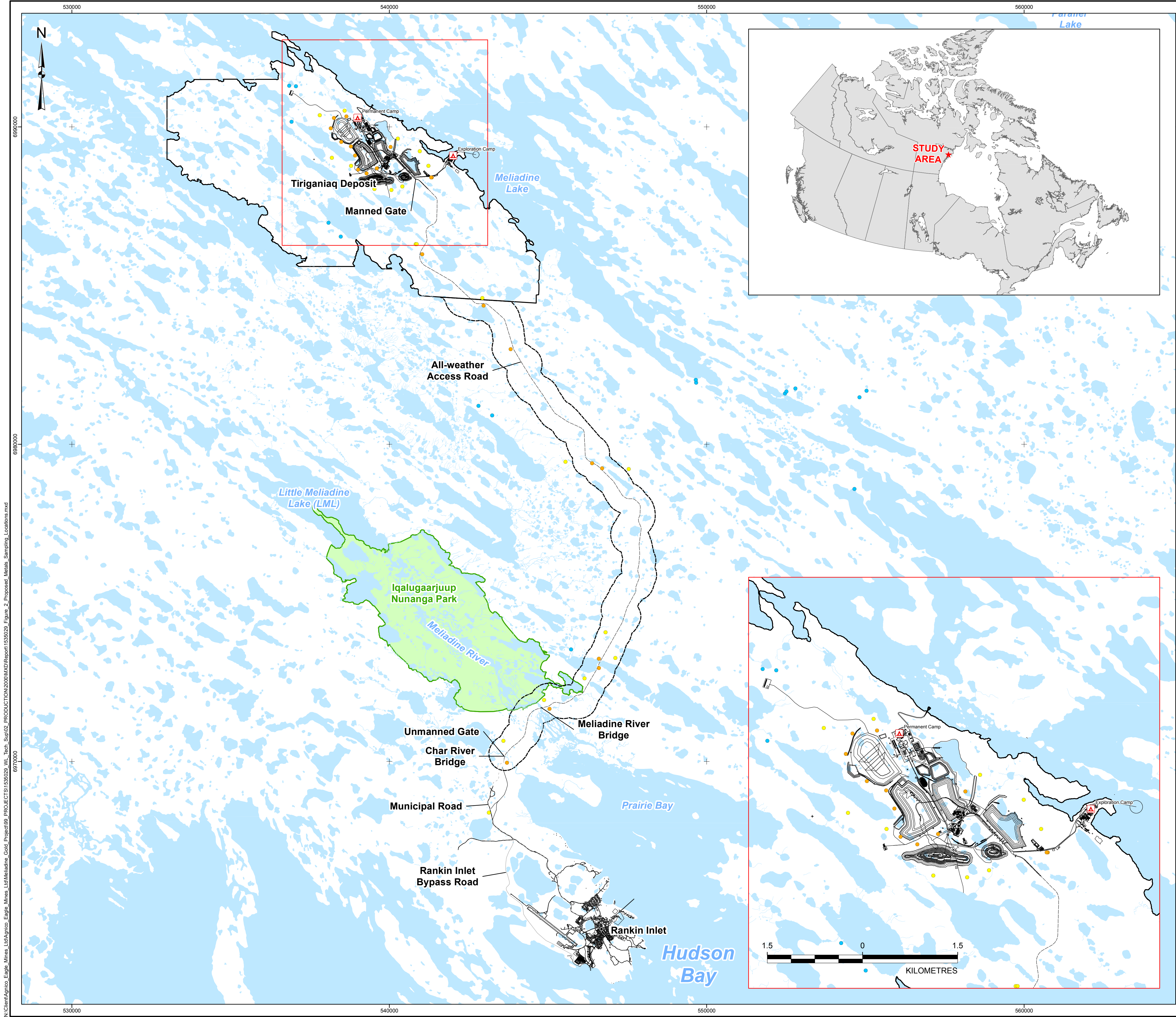


Based on results from Agnico Eagle's Meadowbank operation, the main sources of dust emissions are roads, waste rock, and tailings. Figure 1 shows previous locations sampled for metal concentrations, and Figure 2 shows the locations of proposed on-site, near-site, and reference sampling areas, of which some were sampled in 2008 and 2009 so that subsequent metals data can be compared to baseline levels. In addition, some sampling stations will be placed in close proximity to Dustfall Monitoring Stations (i.e., 2 dynamic stations and 5 static stations) that will be established along the AWAR and adjacent to mining infrastructure (Agnico Eagle 2015) so that the relative change in dustfall could be compared to changes in metal concentrations. The distribution of on-site sampling locations will be stratified by infrastructure component (e.g., AWAR, waste rock storage areas and tailings areas). Metals sampling methods will follow those used in 2008 and 2009 and it is proposed that these areas are sampled prior to construction and for one year after construction. Specifically, soils will be sampled from areas with berry-producing plants and vegetation tissue sampling will be collected from species consistent with past sampling including shrubs, sedges and lichen (see Table 1). Following these sampling periods, it is suggested that metals sampling is completed every three years provided that there are no exceedances in predicted dust deposition parameters (Agnico Eagle 2015). Table 3 shows the proposed stratified sample size for soils and berry-producing plants and lichen and Figure 2 shows the proposed sampling distribution.

**Table 3: Proposed Sampling Strategy for Metals in Soils and Plant Tissue**

Infrastructure Treatment	On-Site	Near-Site	Total
All Weather Access Road (AWAR)	10	10	20
Waste Rock Storage Areas (WRSA)	5	5	10
Tailings Facility	5	5	10
Reference	15		
<b>Total</b>	<b>20</b>	<b>20</b>	<b>55</b>

Analysis of metals concentrations will be similar to previous work done whereby the concentrations are compared against CCME criteria. Reporting of these results will be included in the TEMMP accordingly.



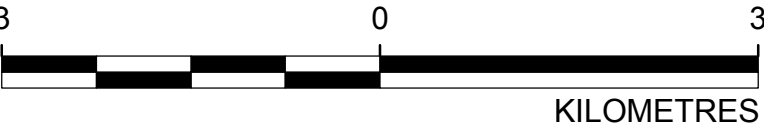
**LEGEND**



PROPOSED METALS SAMPLING LOCATION

- ON-SITE
- NEAR SITE
- REFERENCE
- CAMP
- PROPOSED MINE SITE
- ALL-WEATHER ACCESS ROAD (AWAR)
- ROAD - NEW
- ROAD - EXISTING
- WATERCOURSE
- LOCAL STUDY AREA - MINE
- LOCAL STUDY AREA - ROAD
- WATERBODY
- TERRITORIAL PARK

**REFERENCE**

BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED.  
DATUM: NAD83 PROJECTION: UTM ZONE 15



PROJECT	 <b>AGNICO EAGLE MINES LIMITED</b> <b>MELIADINE GOLD PROJECT</b> <b>NUNAVUT</b>																
TITLE	<b>PROPOSED METALS SAMPLING DISTRIBUTION FOR ON-SITE, NEAR-SITE AND REFERENCE POINTS</b>																
		<table border="1"><tr><td>PROJECT</td><td>1535029</td><td>FILE No.</td></tr><tr><td>DESIGN</td><td>CD</td><td>13 Nov. 2015</td></tr><tr><td>GIS</td><td>CDB</td><td>13 Nov. 2015</td></tr><tr><td>CHECK</td><td>JR</td><td>17 Nov. 2015</td></tr><tr><td>REVIEW</td><td>CD</td><td>17 Nov. 2015</td></tr></table>	PROJECT	1535029	FILE No.	DESIGN	CD	13 Nov. 2015	GIS	CDB	13 Nov. 2015	CHECK	JR	17 Nov. 2015	REVIEW	CD	17 Nov. 2015
PROJECT	1535029	FILE No.															
DESIGN	CD	13 Nov. 2015															
GIS	CDB	13 Nov. 2015															
CHECK	JR	17 Nov. 2015															
REVIEW	CD	17 Nov. 2015															
		<b>SCALE AS SHOWN</b> REV. 0															

**FIGURE: 2**



### Literature Cited

- Agnico Eagle (Agnico Eagle Mines Ltd.). 2014. Final Environmental Impact Statement, Meliadine Gold Project. Submitted to Nunavut Impact Review Board. April 2014.
- Agnico Eagle. 2015. Update Air Quality Monitoring Plan. Submitted to Nunavut Impact Review Board. November 6, 2015.
- CCME (Canadian Council of Ministers of the Environment). 2007. Canadian soil quality guidelines for the protection of environmental and human health. Summary Table Updated September 2007. Canadian Council of Ministers of the Environment. Winnipeg, MB.
- Greger M. 2004. Metal availability, uptake, transport and accumulation in plants. Heavy Metal Stress in Plants: From Biomolecules to Ecosystems. Second Edition. (M.N.V. Prasad, Editor). Springer-Verlag Book Publishers. Berlin.
- Kabata-Pendias A. 2001. Trace elements in soils and plants. CRC Press LLC, Boca Raton. 365 pp.
- Pais I, Jones JB, Jr. 1997. The Handbook of Trace Elements. St. Lucie Press, Boca Raton. 240 pp.

### Personal Communication

- Burt P. 2008. Vegetation Biologist, Individual Contractor. Rankin Inlet, Nunavut. Telephone conversation. December 8, 2008.



**Appendix A**  
**Soil Metal Concentrations 2008 and 2009**



## APPENDIX V – CONDITIONS 38 AND 39

**Table A-1: Soil Metal Concentrations (mg/kg) Associated with each 2008 Sample Plot**

	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tin	Uranium	Vanadium	Zinc
	(Sb)	(As)	(Ba)	(Be)	(Cd)	(Cr)	(Co)	(Cu)	(Pb)	(Hg)	(Mo)	(Ni)	(Se)	(Ag)	(Tl)	(Sn)	(U)	(V)	(Zn)
<b>Detection Limits</b>	0.2	0.2	5	1	0.5	0.5	1	2	5	0.05	1	2	0.2	1	1	5	2	1	10
<b>2007 CCME Guideline (agricultural)</b>	20	12	750	4	1.4	64	40	63	70	6.6	5	50	1	20	1	5	23	130	200
<b>2008 Soil Sample Plots</b>																			
<b>08-001</b>	<0.2	<b>51.8<sup>a</sup></b>	36	<1	<0.5	32.7	14	31	10	<0.05	<1	38	<0.2	<1	<1	<5	<2	22	50
<b>08-002</b>	<0.2	<b>59.9</b>	53	<1	0.5	11.1	9	<b>66</b>	8	0.05	<1	48	<b>1.2</b>	<1	<1	<5	<2	9	60
<b>08-003</b>	<0.2	<b>47.3</b>	93	<1	<0.5	16	19	30	<5	<0.05	2	20	0.4	<b>&lt;1</b>	<1	<5	<2	15	20
<b>08-004</b>	<0.2	<b>13</b>	118	<1	<0.5	12.3	6	8	<5	0.16	<1	10	0.2	<1	<1	<5	<2	8	70
<b>08-005</b>	<0.2	<b>51.1</b>	117	<1	<0.5	10.7	<b>45</b>	<b>72</b>	<5	<0.05	7	39	0.8	<1	<1	<5	<2	9	40
<b>08-006</b>	<0.2	<b>26.9</b>	22	<1	<0.5	25.6	5	18	7	0.08	<1	20	0.2	<1	<1	<5	<2	15	50
<b>08-007</b>	<0.2	<b>13.9</b>	24	<1	<0.5	31.6	5	8	<5	0.09	<1	12	0.2	<1	<1	<5	<2	18	30
<b>08-008</b>	<0.2	<b>23.3</b>	31	<1	<0.5	22	6	9	<5	<0.05	<1	13	0.2	<1	<1	<5	<2	15	40
<b>08-009</b>	<0.2	1.2	51	<1	<0.5	5.2	1	5	<5	0.11	<1	4	0.4	<1	<1	<5	<2	4	20
<b>08-010</b>	<0.2	<b>11.8</b>	81	<1	0.8	23.1	9	18	<5	0.19	<1	19	0.4	<1	<1	<5	<2	15	60
<b>08-011</b>	<0.2	7	73	<1	<0.5	29.4	10	15	<5	<0.05	<1	24	0.2	<1	<1	<5	<2	39	40
<b>08-012</b>	<0.2	<b>49.7</b>	35	<1	<0.5	26.9	15	30	10	<0.05	1	31	<0.2	<1	<1	<5	<2	18	40
<b>08-013</b>	<0.2	5.9	40	<1	<0.5	27.4	7	18	<5	<0.05	1	15	<0.2	<1	<1	<5	<2	29	30
<b>08-014</b>	<0.2	8.4	64	<1	<0.5	29.1	8	29	<5	<0.05	1	24	0.4	<1	<1	<5	<2	25	30
<b>08-015</b>	<0.2	<b>19.5</b>	72	<1	<0.5	51.3	11	13	6	<0.05	<1	22	<0.2	<1	<1	<5	<2	38	50
<b>08-016</b>	<0.2	1.3	113	<1	<0.5	32.2	5	8	<5	0.16	<1	13	0.4	<1	<1	<5	<2	30	40
<b>08-017</b>	<0.2	2.7	74	<1	<0.5	31.8	7	7	<5	<0.05	<1	16	<0.2	<1	<1	<5	<2	27	30
<b>08-018</b>	<0.2	1.4	18	<1	<0.5	8.5	2	5	<5	<0.05	<1	5	<0.2	<1	<1	<5	<2	9	20
<b>08-019</b>	<0.2	1.1	22	<1	<0.5	12.7	3	2	<5	<0.05	<1	7	<0.2	<1	<1	<5	<2	14	20
<b>08-020</b>	<0.2	8.3	50	<1	<0.5	23	15	29	<5	<0.05	<1	26	<0.2	<1	<1	<5	<2	23	40

<sup>a</sup> Values in bold and shaded refer to soil metal concentrations that exceed CCME limits.

mg/kg= milligrams per kilograms; <= less than



## APPENDIX V – CONDITIONS 38 AND 39

**Table A-2: Soil Metal Concentrations (mg/kg) Associated with each 2009 Sample Plot**

Metal		Detection Limits	2007 CCME Guideline (agricultural)	2009 Soil Sample Plots							
				09-D01	09-D02	09-D03	09-D04	09-D05	09-D06	09-D08	09-D09
Aluminum	(Al)	10	n/a	9670	9530	1240	9580	6370	3550	5820	8460
Antimony	(Sb)	0.05	20	<0.050	<0.050	0.113	0.056	<0.050	0.067	<0.050	<0.050
Arsenic	(As)	0.05	12	6.66	<b>12.6<sup>a</sup></b>	4.52	8.91	1.85	1.80	<b>20.3</b>	4.03
Barium	(Ba)	0.1	750	71.3	72.7	61.9	73.6	119	99.9	51.7	64.0
Beryllium	(Be)	0.2	4	3.11	3.71	0.24	2.74	1.73	0.92	2.11	2.73
Bismuth	(Bi)	0.3	n/a	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Cadmium	(Cd)	0.5	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Calcium	(Ca)	10	n/a	5530	6760	26700	1950	3270	4100	7680	5810
Chromium	(Cr)	0.5	64	39.3	39.5	2.98	37.0	33.0	10.5	23.2	36.2
Cobalt	(Co)	0.5	40	11.1	18.4	3.75	6.80	4.89	3.68	10.9	8.95
Copper	(Cu)	0.5	63	53.4	42.6	31.1	22.7	13.5	12.9	32.5	19.4
Iron	(Fe)	5	n/a	17900	21300	1700	16100	10300	5170	11600	15300
Lead	(Pb)	0.1	70	5.31	4.35	5.29	3.98	2.92	2.87	4.06	3.67
Lithium	(Li)	0.5	n/a	12.0	13.1	0.83	9.40	3.24	1.45	7.16	12.6
Magnesium	(Mg)	5	n/a	6740	6550	1060	5200	3850	1770	4520	7080
Manganese	(Mn)	0.2	n/a	238	425	271	90.6	138	50.9	237	251
Mercury	(Hg)	0.01	6.6	0.113	0.023	0.202	0.169	0.180	0.161	0.015	0.025
Molybdenum	(Mo)	0.05	5	0.679	0.688	1.34	0.648	0.484	0.322	0.297	0.244
Nickel	(Ni)	0.5	50	26.8	33.0	20.6	16.3	10.5	6.97	17.2	16.9
Phosphorus	(P)	20	n/a	658	672	939	885	1070	872	619	596
Potassium	(K)	100	n/a	2670	1970	1090	1330	2300	680	1110	2530
Selenium	(Se)	1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sodium	(Na)	100	n/a	320	310	130	<100	120	100	210	230
Strontium	(Sr)	0.3	n/a	31.5	41.2	195	19.4	17.8	29.8	32.2	28.6
Thallium	(Tl)	0.03	1	0.174	0.214	0.066	0.106	0.137	0.043	0.090	0.124
Tin	(Sn)	0.2	5	0.47	0.42	0.28	0.25	0.30	0.25	0.31	0.37
Titanium	(Ti)	0.5	n/a	824	945	67.6	446	666	300	574	878
Uranium	(U)	0.01	23	1.97	1.37	0.634	0.647	0.592	0.353	0.527	0.688
Vanadium	(V)	0.5	130	27.7	26.1	3.67	16.3	19.2	6.91	17.7	26.6
Zinc	(Zn)	0.5	200	46.7	48.9	53.5	39.7	44.7	32.5	32.3	36.3

<sup>a</sup> Values in bold and shaded refer to soil metal concentrations that exceed CCME guidelines.

mg/kg= milligram per kilogram; <= less than.



**Appendix B**

**Plant Tissue Metal Concentrations 2008 and 2009**



## APPENDIX V – CONDITIONS 38 AND 39

**Table B-1: Range of Selected Metal Concentrations in Collected Plant Tissue in 2008**

Scientific Name	Common Name	# of samples	Aluminum (Al) (mg/kg)	Arsenic (As) (mg/kg)	Iron (Fe) (mg/kg)	Manganese (Mn) (mg/kg)	Nickel (Ni) (mg/kg)	Zinc (Zn) (mg/kg)
<i>Arctostaphylos alpina</i>	Alpine manzanita	3	450 to 1890	0.7 to 2.1	266 to 1210	47.8 to 243	1.6 to 4.6	81.9 to 140
<i>Aulacomnium</i> moss	n/a	1	390	<0.2	256	749	3.8	48.6
<i>Betula nana</i>	Swamp birch	4	30 to 130	0.2 to 0.7	48 to 125	67.9 to 554	0.9 to 6	73.6 to 174
<i>Carex aquatilis</i>	Water sedge	3	190 to 520	1.8 to 3.7	245 to 1050	211 to 301	1.9 to 3.9	18.6 to 29.2
<i>Carex misandra</i>	Shortleaf sedge	1	170	0.5	187	121	4.1	17.5
<i>Flavocetraria nivalis</i>	Crinkled snow lichen	11	180 to 2090	0.2 to 1.4	140 to 1600	79.2 to 235	1 to 4.3	17.9 to 27.5
<i>Empetrum nigrum</i>	Black crowberry	11	30 to 880	0.2 to 1.1	33 to 628	271 to 860	2.1 to 4.9	11.7 to 19.8
<i>Ledum paulstre</i> ssp. <i>decumbens</i>	Marsh Labrador tea	2	70 to 80	<0.2 to <0.2	52 to 63	170 to 264	0.7 to 1	25.8 to 30.6
<i>Oxytropis arctica</i> var. <i>belli</i>	Bell's Point-vetch	1	120	0.3	112	107	10	16.9
<i>Poa</i> sp.	Bluegrass	1	170	0.7	214	38.7	1.3	12.9
<i>Salix planifolia</i>	Tealeaf willow	1	40	<0.2	105	295	1.9	523
<i>Salix lanata</i> ssp. <i>richardsonii</i>	Lanate willow	1	220	1.7	389	136	2.6	378
<i>Vaccinium uliginosum</i>	Arctic blueberry	2	230 to 280	0.2 to 0.5	83 to 154	685 to 1160	1.2 to 1.6	39.3 to 46.3
<i>Vaccinium vitis-idaea</i>	Mountain cranberry	2	100 to 180	0.2 to 0.2	67 to 130	398 to 682	2.1 to 3.7	24.3 to 30.1



## APPENDIX V – CONDITIONS 38 AND 39

**Table B-2: Range of Selected Metal Concentrations in Collected Plant Tissue in 2009**

Scientific Name	Common Name	# of samples	Aluminum (Al) (mg/kg)	Arsenic (As) (mg/kg)	Iron (Fe) (mg/kg)	Manganese (Mn) (mg/kg)	Nickel (Ni) (mg/kg)	Zinc (Zn) (mg/kg)
<i>Arctostaphylos alpina</i>	Alpine manzanita	1	155	0.398	281	1.09	47.2	55.3
<i>Betula nana</i>	Swamp birch	2	16 to 26	0.097	49.4 to 53.9	0.63 to 9.72	126 to 1330	49.2 to 222
<i>Flavocetraria nivalis</i>	Crinkled snow lichen	2	186 to 511	0.389 to 0.405	238 to 317	1.74 to 3.05	99.8 to 123	19.6 to 32.3
<i>Empetrum nigrum</i>	Black crowberry	6	91 to 222	0.085 to 0.257	104 to 251	2.55 to 5.73	253 to 659	12.3 to 21.1
<i>Ledum paulstre ssp. decumbens</i>	Marsh Labrador tea	3	43 to 46	0	32.3 to 42.6	0.81 to 0.94	579 to 1020	31.5 to 37.5
<i>Vaccinium uliginosum</i>	Arctic blueberry	1	48	0.057	42.1	6.07	1470	31.3
<i>Vaccinium vitis-idaea</i>	Mountain cranberry	1	91	0	45.8	1.02	2380	25.8

mg/kg= milligram per kilogram

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**APPENDIX V • 2019-2020 HUNTER HARVEST STUDY CALENDAR FOR RANKIN INLET, NUNAVUT**

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ᐆᓴᑦᑲ ᑕᑭᑦᑲ ᑕᑶᑲᑯᑦᑲ ᑭᑦᑲ ᑭᑦᑲ ᑭᑦᑲ

# 2019-2020



Photo - Putulik Photography

Survey conducted by Rankin Inlet Kivalliq Hunters and Trapper Association with assistance from Agnico Eagle Mines Limited

[illegible]

For hunters participating in the Rankin Inlet – Kivalliq Harvest Reporting Study  
LᑲΔΠᓂᑦ Δᑕᐅᔨᑦ ᑲᖃᑦᑕᓂᑦᑦᑦ - ᐱᑭᑦᑕᑦᑦ LᑲΔᑕᐅᔨᓂᑲᑦ ᐅᑲᐅᑦᑲᑦᑦᑦᑦᑦᑦ ᑲᐅᔨᔨΔᓂᑲᑲᑦ



Photo - AEM

The Rankin Inlet Kivalliq Hunters and Trapper Association (KHTO) in cooperation with Agnico Eagle Mines Limited (AEM) is collecting information on caribou hunting patterns of Rankin Inlet residents from July 2019 to July 2020. This information will provide insight on interactions between caribou and the Meliadine Mine site.

A map is included in the calendar and displays the study area around Rankin Inlet. The map is divided by a grid; each cell has its own designation. For each harvest made, the hunter will identify the location of harvest on the map and note the grid cell on the information table of the appropriate month. The information table will ask for; date, map grid, number and type of caribou harvested (bull, cow or non-adult) and any comments. Please provide as much information as possible; if specific facts cannot be recalled, the hunters best estimation is appropriate. It is important to note that only harvested caribou (male, female, yearling or calves) are to be recorded.

Periodically a representative from KHTO will discuss the Harvest Study with the hunters. Please return the calendar to the KHTO office in August 2020 and the data will be reviewed.

If there are any questions relating to this study please contact the KHTO at [rankin@kivallightto.ca](mailto:rankin@kivallightto.ca)

[illegible][illegible]

ክልሉ የሚኖሩት ሕዝቦች በጥቅምት 2020-2021 ዓ.ም. ለጥገናው የተሳተፉት ሕዝቦች ብዛት 1,200 ሆኖ ተመዝግቧል፡፡

[illegible]

ኢህፓር 2019 July

Sunday ሐረር	Monday ሐረርጋጽ	Tuesday ጋረ	Wednesday ለገረ	Thursday ገር	Friday ርረ	Saturday ሐረርጋጽ
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

# Caribou Harvest Record

כ"כ צ"ל כ"כ

- ☐ Check here if you did not harvest any caribou this month
- ☐ ᐅᓂᓕ ᐱᓇᐱᐃᑦ ᓗᑎᑦ ᓖᓖᐱᐅᓕᓄᑦᐃᐃᑦ ᑕᓕᐃᓂ ᑕᓕᓁᑦᑦᑕᑦ

[illegible]

**Bulls:** Adult Males  
 $\triangleleft^a \sigma^c$ :  $\triangleleft^a \cup \cap \triangleleft^c$

**Cows: Adult Females**  
 $\Delta^c \underline{a} \Delta^c : \Delta^c \underline{a} \Delta^c$

**Non-adults:** Includes calves and yearlings, male and female  
𐌲ᚱᑦᓂᕈᖅ: ᐃᔭᐅᙴᖅ ᐳᚱᑦᓂᕈᖅ ᐊᒻᒪᓯ ᐆᑐᓬᕋᖅ, ᐊᗝᓇᓸᐊᖅ ᐊᒻᒪᓯ ᐊᗷᓄᓸᐊᖅ

Notes/ ဂဏန်းများ:



◁d<sup>c</sup>∩P<sup>q</sup>Δ<sup>b</sup> 2019 August

Sunday ሐረርል	Monday ሐረርልጋፍፀፈ	Tuesday ጋፍፀፈ	Wednesday ለፍፀፈፈ	Thursday ገርገፍፀ	Friday ርፍፀፈ	Saturday ሐረርልፈገፍፀ
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

# Caribou Harvest Record

כ<sup>ב</sup> כד▶ ל<sup>ב</sup> חח<sup>ב</sup> ט<sup>ב</sup>

- ☐ Check here if you did not harvest any caribou this month
- ☐ ᐅᓂᓐᓴ ᐱᓐᓴᐃᓐ ᓂᐅᓐ ᓂᓐᓴᐃᓐ ᐅᓐᓴᐃᓐ ᐅᓐᓴᐃᓐ

[illegible]

**Bulls:** Adult Males  
 $\angle^a \sigma^c$ :  $\angle^a \cup \cap \Delta \angle^c$

**Cows: Adult Females**  
 $\Delta^c \text{ } \underline{\Delta} \Delta^c : \Delta^c \text{ } \underline{\Delta} \Delta^c$

**Non-adults:** Includes calves and yearlings, male and female  
믄ᆯᆞᆺᆡᆷᆮᆪᆸᆽᆹᆻᆿᆺᆰᆼᆴᆾᆶᆵᆱᆲᆢᆣᆤᆥᆦᆧᆨᆩᆪᆫᆬᆭᆮᆯᆰᆱᆲᆳᆴᆵᆶᆷᆸᆹᆺᆻᆼᆽᆾᆿ

[illegible]

◁ΓΔ⚡⁹Δᵇ 2019 September

Sunday ሐረርልረ	Monday ሐረርልረፅፍፀፈ	Tuesday ጋፍረ	Wednesday ለፍፍረ	Thursday ፖርፍ	Friday ርፍረ	Saturday ሐረርልረፅፍፀፈ
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

# Caribou Harvest Record

כ<sup>ב</sup> כד▶ רמ<sup>כ</sup> חח<sup>כב</sup> ט<sup>כב</sup>

- ☐ Check here if you did not harvest any caribou this month
- ☐ ᐅᓂᓕᑦ ᐱᓇᐱᓄᓐ ᓂᐁᓂᓄᓐ ᐅᓂᓕᑦ ᐅᓂᓕᑦ ᐅᓂᓕᑦ

[illegible]

**Bulls: Adult Males**  
 $\triangleleft^a \sigma^c : \triangleleft^a \cup \cap \Delta \triangleleft^c$

**Cows: Adult Females**  
 $\Delta^c \underline{a} \Delta^c : \Delta^c \underline{a} \Delta^c$

**Non-adults:** Includes calves and yearlings, male and female  
**ᄆᅇᄃᄂᄋ:** ᄁᄌᄎᄊᄒ ᄆᅇᄃᄂᄋ ᄈᄌᄏᄓ ᄆᄉᄔᄕᄑᄒ, ᄈᅀᄏᄐᄒᄖᄒ ᄈᄌᄏᄓ ᄈᅇᄒᄒᄖᄒ

Notes/ ၈၈၄၂၂၃၄၅:[illegible]

▷▷▷ 2019 October

Sunday ሐረርል	Monday ሐረርል፡፡ፍፍ፡፡	Tuesday ፡፡ፍፍ፡፡	Wednesday ሐረርል፡፡ፍፍ፡፡	Thursday ፡፡ፍፍ፡፡	Friday ፡፡ፍፍ፡፡	Saturday ሐረርል፡፡ፍፍ፡፡
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

# Caribou Harvest Record

כ<sup>ב</sup> כד▶ ל<sup>ב</sup> חח<sup>ב</sup> ט<sup>ב</sup>

- ☐ Check here if you did not harvest any caribou this month
- ☐ ᐅᓂᓗᑦ ᐱᓇᐱᐃᓪ ᓂᐁᓂ ᐅᓄᐅᓂᓕᐃᓪ ᑕᓚᓂᓂ ᑕᓖᓂᓪᑦ

[illegible]

**Bulls:** Adult Males  
 $\triangleleft^a \sigma^c : \triangleleft^a \cup \cap \triangleleft^c$

**Cows: Adult Females**  
 $\Delta^c \underline{a} \Delta^c : \Delta^c \underline{a} \Delta^c$

**Non-adults:** Includes calves and yearlings, male and female  
 ມ່ຽດ: ແຕ່ປີ້ ມ່ຽດ ໄປລາ ບໍ່ມີເງົາ, ໂຍນອາໄສ ໄປລາ ເຈັກຄວາ

Notes/  $\Pi\Pi\Gamma\Delta\Gamma\Delta^c$ :



2019 November

Sunday ሐረርል	Monday ሐረርል፡፱፻፳፭	Tuesday ጋረል	Wednesday ለ፲፭፻፳፭	Thursday ፖር፲፻፳፭	Friday ርረ፲፻፳፭	Saturday ሐረርል፡፱፻፳፭
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

# Caribou Harvest Record

כ<sup>ב</sup> כד▶ ל<sup>ב</sup> חח<sup>ב</sup> ב<sup>ב</sup>

- ☐ Check here if you did not harvest any caribou this month
- ☐ ᐅᓂᑦᓴ ᐱᓇᐱᐃᑦ ᓗᑎᑦ ᓖᓖᐸᐅᑦᓯᐃᐃᑦ ᑕᓴᔭᓂ ᑕᓴᓯᑦᑦ

[illegible]

**Bulls:** Adult Males  
 $\angle^a \sigma^c$ :  $\angle^a \cup \cap \Delta \angle^c$

**Cows: Adult Females**  
 $\Delta^{\text{f}} \text{ } \underline{\Delta} \Delta^{\text{c}} : \Delta^{\text{f}} \text{ } \underline{\Delta} \Delta^{\text{c}}$

[illegible]Notes/ ၈၈၄၂၃၅၆၇၈၉၀:[illegible]

Photo - Putulik Photography

◁<sup>l</sup>▷<sup>r</sup>Δ<sup>b</sup> 2019 December

Sunday ሐረር	Monday ሐረርጋፍ	Tuesday ጋፍ	Wednesday ሐረር	Thursday ጋፍ	Friday ሐረር	Saturday ሐረርጋፍ
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

# Caribou Harvest Record

כ"ב כ"ג כ"ד כ"ה כ"ו כ"ז כ"ח כ"ט

- ☐ Check here if you did not harvest any caribou this month
- ☐ ᐅᓂᓗᑦ ᐱᓇᐱᐃᓪ ᓂᐁᐭᐤ ᐱᓄᐃᐃᓪ ᐸᓚᓂ ᐸᓄᓯᐸᓪ

[illegible]

**Bulls:** Adult Males  
 $\angle^a \sigma^c$ :  $\angle^a \cup \cap \Delta \angle^c$

**Cows: Adult Females**  
 $\Delta^c \text{ } \underline{\Delta} \Delta^c : \Delta^c \text{ } \underline{\Delta} \Delta^c$

**Non-adults:** Includes calves and yearlings, male and female  
**ᄆᄋᄇᄃ:** ᄁᄌᄎᄃᄃ ᄆᄋᄇᄃᄃ ᄆᄋᄇᄃᄃ ᄆᄋᄇᄃᄃ ᄆᄋᄇᄃᄃ ᄆᄋᄇᄃᄃ ᄆᄋᄇᄃᄃ

Notes/  $\Pi\Pi\Gamma\Delta\Gamma\Delta^c$ :



2020 January

Sunday ሐረርልር	Monday ሐረርልር፡፱፻፳፭	Tuesday ጋፍረል	Wednesday ለ፲፭፻፳፭	Thursday ፲፭፻፳፭	Friday ፭፻፳፭	Saturday ሐረርልር፡፱፻፳፭
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

# Caribou Harvest Record

כ<sup>ב</sup> כד▶ ל<sup>ב</sup> חח<sup>ב</sup> ב<sup>ב</sup>

- ☐ Check here if you did not harvest any caribou this month
- ☐ ᐅᓂᑲᔭ ᐱᕗᕙᐃᑦ ᑐᒋᑦ ᑐᓄᐤᐅᓴᓯᐃᐳᑦ ᑕᔪᑲᓂ ᑕᔪᓯᑦᑖᑦ

[illegible]

**Bulls:** Adult Males  
 $\angle^a \sigma^c$ :  $\angle^a \cup \cap \Delta \angle^c$

**Cows: Adult Females**  
 $\Delta^c \text{ } \underline{\Delta} \Delta^c : \Delta^c \text{ } \underline{\Delta} \Delta^c$

[illegible]

Notes/ རྒྱུ་འབྱུང་པའི་ལུང་ལྟར་:



2020 February

Sunday ሐረርል	Monday ሐረርል፡፡ፍፍ፡፡	Tuesday ፡፡ፍፍ፡፡	Wednesday ሐረርል፡፡ፍፍ፡፡	Thursday ፡፡ፍፍ፡፡	Friday ፡፡ፍፍ፡፡	Saturday ሐረርል፡፡ፍፍ፡፡
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

# Caribou Harvest Record

כ<sup>ב</sup> כד▶ ל<sup>ב</sup> חח<sup>ב</sup> ט<sup>ב</sup>

- ☐ Check here if you did not harvest any caribou this month
- ☐ ᐅᓂᑦᔭ ᐱᓇᐱᐃᑦ ᓗᑎᑦ ᓖᓖᐸᐅᑦᕿᐃᐃᑦ ᑕᒪᐊᓂ ᑕᕿᐆᑦᑦ

[illegible]

**Bulls:** Adult Males  
 $\triangleleft^a \sigma^c : \triangleleft^a \cup \cap \triangleleft^c$

**Cows: Adult Females**  
 $\Delta^{\text{f}} \text{ } \underline{\Delta} \Delta^{\text{c}} : \Delta^{\text{f}} \text{ } \underline{\Delta} \Delta^{\text{c}}$

**Non-adults:** Includes calves and yearlings, male and female  
**♂♀Δ<sup>c</sup>:** Δ└▷┐<sup>c</sup> ♂♀Δ<sup>c</sup> ◁└┘ ▮┘Δ<sup>c</sup>, ◁◌┘◊◁◁<sup>c</sup> ◁└┘ ◁<sup>c</sup>◊◁◁<sup>c</sup>

Notes/  $\Pi\Pi\Gamma\Delta\Gamma\Delta^c$ :



2020 March

Sunday ሐረር	Monday ሐረርጋጽ	Tuesday ጋረ	Wednesday ለገረ	Thursday ገር	Friday ርረ	Saturday ሐረርጋጽ
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

# Caribou Harvest Record

כ<sup>ב</sup> כד▶ ל<sup>ב</sup> חח<sup>ב</sup> ט<sup>ב</sup>

- ☐ Check here if you did not harvest any caribou this month
- ☐ ᐅᓂᑦᓴ ᐱᓇᐱᐃᑦ ᓗᑎᑦ ᓖᓖᐸᐅᑦᓯᐃᐃᑦ ᑕᓴᔭᓂ ᑕᓴᓯᑦᑦ

[illegible]

**Bulls:** Adult Males  
 $\angle^a \sigma^c$ :  $\angle^a \cup \cap \Delta \angle^c$

**Cows: Adult Females**  
 $\Delta^c \text{ } \underline{\Delta} \Delta^c : \Delta^c \text{ } \underline{\Delta} \Delta^c$

[illegible][illegible]

Photo - Putulik Photography

$\Pi_{\Delta^c} \rightarrow \Delta^c$  2020 April

Sunday ሐፍርል	Monday ሐፍርልጋዳሽ	Tuesday ኃይለ	Wednesday እቴጌ	Thursday የተረፈ	Friday ቀንበር	Saturday ሐፍርልጋደረግ
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

# Caribou Harvest Record

כ<sup>ב</sup> כד▶ ל<sup>ב</sup> חח<sup>ב</sup> ט<sup>ב</sup>

- ☐ Check here if you did not harvest any caribou this month
- ☐ ᐅᓂᑦᓴ ᐱᓇᐱᐃᑦ ᓗᑎᑦ ᓖᓖᐸᐅᑦᓯᐃᐃᑦ ᑕᓴᔨᑦ ᑕᓴᓯᑦᑦ

[illegible]

**Bulls:** Adult Males  
 $\triangleleft^a \sigma^c$ :  $\triangleleft^a \cup \cap \triangleleft^c$

**Cows: Adult Females**  
 $\Delta^c \underline{a} \Delta^c : \Delta^c \underline{a} \Delta^c$

**Non-adults:** Includes calves and yearlings, male and female  
**♂♀Δ<sup>c</sup>:** Δ┐▷⋄<sup>c</sup> ♂♀Δ<sup>c</sup> ◁└┘ ▹▸△<sup>c</sup>, ▷◀▽∆◁<sup>c</sup> ◁└┘ ▷◅∆◁<sup>c</sup>

Notes/ ၈၈၄၂၂၃၄၅:This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Photo - Putulik Photography

**ᠮᠤᠴᠢᠳᠤ** 2020 May

Sunday ከረርሰኛ	Monday ከረርሰኛ፡ሰኞ	Tuesday ከረርሰኛ	Wednesday ከረርሰኛ	Thursday ከረርሰኛ	Friday ከረርሰኛ	Saturday ከረርሰኛ
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24/31	25	26	27	28	29	30

# Caribou Harvest Record

כ<sup>ב</sup> כד▶ ל<sup>ב</sup> חח<sup>ב</sup> ב<sup>ב</sup>

- ☐ Check here if you did not harvest any caribou this month
- ☐ ᐅᓂᑲᓪ ᐱᓇᐱᐃᑦ ᓗᑎᑦ ᓖᓖᐱᐅᑲᒃᑯᐃᑦ ᑕᓪᓄᓂ ᑕᓪᑭᑦᑏᑦ

[illegible]

**Bulls:** Adult Males  
 $\triangleleft^a \sigma^c$ :  $\triangleleft^a \cup \cap \triangleleft^c$

**Cows: Adult Females**  
 $\Delta^c \underline{a} \Delta^c : \Delta^c \underline{a} \Delta^c$

**Non-adults:** Includes calves and yearlings, male and female  
**ᄆᄋᄇᄃ:** ᄇᄃᄇᄃᄃ ᄆᄋᄇᄃᄃ ᄇᄃᄃᄃ ᄇᄃᄃᄃᄃᄃ, ᄇᄃᄃᄃᄃᄃ ᄇᄃᄃᄃ ᄇᄃᄃᄃᄃᄃ

Notes/ རྒྱུ་འབྱུང་པའི་ལུང་ལྟར་:



L<sup>a</sup>σ<sup>c</sup> 2020 June

Sunday ሐረር	Monday ሐረርጋጽ	Tuesday ጋረ	Wednesday ለገረ	Thursday ገር	Friday ርረ	Saturday ሐረርጋጽ
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

# Caribou Harvest Record

כ<sup>ב</sup> כד▶ ל<sup>ב</sup> חח<sup>ב</sup> ט<sup>ב</sup>

- ☐ Check here if you did not harvest any caribou this month
- ☐ ᐅᓂᑲᓪ ᐱᓇᐱᐃᑦ ᓗᑎᑦ ᓖᓖᐱᐅᑲᒃᑯᐃᑦ ᑕᓪᐸᓂ ᑕᓪᑭᑦᑏᑦ

[illegible]

**Bulls:** Adult Males  
 $\angle^a \sigma^c$ :  $\angle^a \cup \cap \Delta \angle^c$

**Cows: Adult Females**  
 $\Delta^c \text{ } \underline{\Delta} \Delta^c$ :  $\Delta^c \text{ } \underline{\Delta} \Delta^c$

**Non-adults:** Includes calves and yearlings, male and female  
**♂♀ΔC:** ΔC▷<sup>r</sup>C ♂♀ΔC ◁<sup>L</sup>L ▯▯▷LΔC, ◁<sup>y</sup>∩Δ◁ ◁<sup>L</sup>L ▷◁<sup>e</sup>Δ◁

[illegible]

ኢጊጊጊ 2020 July

Sunday ከረርሰኛ	Monday ከረርሰኛ፡ሰኞ	Tuesday ከረርሰኛ	Wednesday ከረርሰኛ	Thursday ከረርሰኛ	Friday ከረርሰኛ	Saturday ከረርሰኛ
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

# Caribou Harvest Record

כ<sup>ב</sup> כד▶ ל<sup>ב</sup> חח<sup>ב</sup> ב<sup>ב</sup>

- ☐ Check here if you did not harvest any caribou this month
- ☐ ᐅᓂᕐᓴ ᐱᓇᐱᐃᑦ ᓂᐁᐭ ᓂᓄᓂᐃᐃᑦ ᐸᕐᓴᓂ ᐸᕐᓂᑦᑦᑦ

[illegible]

**Bulls:** Adult Males  
 $\triangleleft^a \sigma^c$ :  $\triangleleft^a \cup \cap \triangleleft^c$

**Cows: Adult Females**  
 $\Delta^c \underline{a} \Delta^c : \Delta^c \underline{a} \Delta^c$

**Non-adults:** Includes calves and yearlings, male and female  
**ᄆᄆᄆᄆᄆ:** ᄆᄆᄆᄆᄆ ᄆᄆᄆᄆᄆ ᄆᄆᄆᄆᄆ ᄆᄆᄆᄆᄆ, ᄆᄆᄆᄆᄆ ᄆᄆᄆᄆᄆ ᄆᄆᄆᄆᄆ

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

