Kiggavik Project
Final Environmental Impact Statement

Tier 3 Technical Appendix 6D:
Wildlife Mitigation and Monitoring Plan

September 2014

History of Revisions

Revision Number	Date	Details of Revisions
01	December 2011	Initial release Draft Environmental Impact Statement (DEIS)
02	September 2014	FINAL Environmental Impact Statement

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Acronyms and Abbreviations

AREVA.....AREVA Resources Canada Inc.

agl..... Above Ground Level

e.g.....For example

CESA.....Cumulative Effects Study Area

COPC .....Contaminants of Potential Concern

EIS..... Environmental Impact Statement

EMAB.....Environmental Monitoring and Advisory Board

ENR .....Environment and Natural Resources

FEIS.....Final Environmental Impact Statement

GIS.....Geographic Information System

GN .....Government of Nunavut

GNDoE .....Government of Nunavut, Department of Environment

GPS ..... Global Positioning System

HTO ..... Hunters and Trappers Organization

i.e. ..... 'That is' or 'in other words'

IMS ..... Integrated Management System

IQ..... Inuit Qaujimajatuqangit

LSA.....Local Study Area

NIRB .....Nunavut Impact Review Board

NLCA .....Nunavut Land Claims Agreement

NPC ..... Nunavut Planning Commission

NGMP ..... Nunavut General Monitoring Plan

NWMB .....Nunavut Wildlife Management Board

Project.....The Kiggavik Project

PSP..... Permanent Sampling Plot

RSA .....Regional Study Area

SARA.....Species at Risk Act

SHEQ ..... Safety, Health, Environment, and Quality

SOP ..... Standard Operating Procedure

TMF ..... Tailings Management Facility

TBD ..... To be decided

VEC ..... Valued Environmental Component

WMMP ..... Wildlife Mitigation and Monitoring Plan

ZOI ..... Zone of Influence

1 Introduction

1.1 Overview

This Wildlife Mitigation and Monitoring Plan (WMMP) for the Kiggavik Project (the Project) describes mitigation and monitoring that AREVA Resources Canada Inc. (AREVA) will implement to reduce or eliminate disturbance effects on terrestrial wildlife and wildlife habitat. The WMMP provides guidance to protect and limit disturbances to birds and terrestrial wildlife from Project activities. The WMMP lists all of the mitigation actions that will be taken and provides an overview of the monitoring efforts proposed to assess Project effects on terrestrial wildlife and wildlife habitat.

The WMMP is a working document. The action items listed in this document will develop and evolve through the life of the Project with input from regulators and stakeholders that participate in the review of the results of monitoring activities. Revisions will keep the mitigation and monitoring actions focused on key potential effects to ensure that AREVA and stakeholder resources are effectively applied to managing Project effects on terrestrial wildlife and wildlife habitat. The process by which this is achieved is outlined in Tier 3, Appendix 2T, Environmental Management Plan. The Integrated Management System (IMS) outlines how facility design, environmental assessment commitments and conditions, and management, mitigation and monitoring plans are integrated into facility construction, operation and decommissioning. The IMS facilitates the identification of continual improvement initiatives and adaptive management requirements, when necessary. The IMS is consistent with the IQ concept of Pilimmaksarniq/Ayoikyumikatakhimanik; skills must be improved and maintained through experience and practice (Nunavut Wildlife Act 2012-11-06).

1.2 Purpose

The WMMP forms part of the Kiggavik Project Final Environmental Impact Statement (FEIS) submission to the Nunavut Impact Review Board (NIRB). The purpose of the WMMP is to provide information on wildlife mitigation and monitoring strategies and was written to address the NIRB "*Guidelines for the Preparation of an Environmental Impact Statement For AREVA Resources Canada Inc.'s Kiggavik Project."* More specifically, the WMMP was written to provide details on "*…appropriate mitigation and monitoring for selected terrestrial …species, with consideration for potential impacts identified in the relevant subsections of the EIS.*"

Wildlife mitigation and monitoring for the Project will include:

1. A WMMP that includes the following:

a. Lessons learned from other projects in the region;
b. Incorporation of Inuit Qaujimajatuqangit (IQ) and information requirements of regulators and stakeholders;
c. Mitigation and management policies, practices and effects monitoring study designs and procedures to prevent or reduce Project-related effects on wildlife.

2. A reporting mechanism that summarizes the findings of mitigation and management policies, practices and effects monitoring programs.
3. A review process to address monitoring program findings, with feedback from regulators and stakeholders and modification of procedures, practices and programs when required.

The WMMP is a working document and will be updated as required. Updates to this document may be a result of management reviews, regulatory changes, project related changes and information obtained during wildlife monitoring. A version history table is included at the beginning of this document to note any major revisions.

1.3 Regulatory Background and Requirements

The WMMP is intended to meet the NIRB guidelines, and the legislation, regulations and/or requirements regarding wildlife and wildlife habitat from other regulatory authorities. Acts, policies, and plans that were considered during the development of the WMMP include:

1.3.1 Territorial Legislation

1.3.1.1 *Nunavut Wildlife Act and Nunavut Hunting Regulations*

The *Nunavut Wildlife Act* (Government of Nunavut 2005) is territorial legislation established for the management of wildlife and habitat in Nunavut, including the conservation, protection and recovery of species at risk. The *Act* applies to all terrestrial and aquatic wildlife and their habitat. The Department of Environment Wildlife Management Division has a legislated mandate for the management of terrestrial species in Nunavut and is responsible for fulfilling Government of Nunavut (GN) responsibilities under federal legislation, and national and international agreements and conventions. The following components of the Nunavut Wildlife Act were specifically considered:

Harvest

Section 10(1) identifies the Inuit right to harvest subject to where harvesting does not exceed his or her basic needs level where a total allowable harvest for a population is established. Section 10(2) further states that where a total allowable harvest for a population is not established, than an Inuk can harvest, without exceeding, their full economic, social and cultural needs. Section 10(4) states that non-quota limitations established on Inuit shall not unduly or unreasonably constrain their

harvesting activities. Section 11 states that "…all Inuit have the free and unrestricted right of access for the purpose of harvesting wildlife to all lands within Nunavut". The right of access is excluded within a radius of 1.6 km of any building, structure or other facility on lands under a surface lease (Section11(2)(f)). The right of access may also be limited by the Nunavut Wildlife Management Board (NWMB) for the purposes of conservation (Section 11(3)(b)). Section 11(4) states that "Pursuant to the Agreement, any term of an employment contract that attempts to limit an Inuk's rights of access to wildlife or harvesting of wildlife during the Inuk's leisure hours shall be null and void. Section 120 (1) identifies the NWMB as the authority in the Nunavut Settlement Area that establishes levels of total allowable harvest or harvesting. Section 121 states that the Minister may establish limits on the quantity of wildlife that may be harvested where necessary to implement a decision of the NWMB or where the Minister considers it necessary or advisable in respect to those matters within the jurisdiction of the GN.

1.3.2 Federal Legislation

1.3.2.1 *Nunavut Land Claims Agreement*

Section 12.5.2 of The Nunavut Land Claims Agreement (NLCA) states that any proponent proposing a project within the territory of Nunavut is responsible for preparing an EIS in accordance with the guidelines established by NIRB (NLCA 1993). Section 12.5.2 of the NLCA states that the proponent is responsible for providing information on:

1. Any proposed contingency plans, to avoid and mitigate adverse impacts (subsection 12.5.2(d)); and,

2. The monitoring program that the proponent proposes to establish with respect to ecosystemic and socio-economic impacts (subsection 12.5.2(g)).

Additionally, under the NLCA, the government has the ultimate responsibility for wildlife. The GN Department of the Environment is the lead GN Agency in fulfilling Government obligations with respect to wildlife in Nunavut.

The NWMB is the main instrument of wildlife management and the main regulator of access to wildlife in Nunavut. Among the functions of the Board is the establishment, modification or removal of total allowable harvest (TAH) levels. The exercise of harvesting by Inuit is overseen by the Regional Wildlife Organizations (RWO) and the Hunters and Trappers Organization (HTO). Powers and functions of the HTO include regulation of harvest technique, allocation and enforcement of community basic needs and management among members. Section 5.2.1 (i) of the NLCA states that Government of Nunavut retains the ultimate responsibility for wildlife management.

1.3.3 Species and Risk Act (SARA)

The SARA is federal legislation that "provides for the legal protection of wildlife species and the conservation of the biological diversity" (Species at Risk Public Registry 2014). The SARA is designed to prevent the extirpation and/or extinction of wildlife species through formal protection measures identified through a species recovery planning process. The plans are designed to identify actions that will lead to the recovery of species of conservation concern. Schedule 1 of the SARA lists the status of species of conservation concern under four risk categories: extirpated, endangered, threatened, and species of special concern. Once a species is listed on Schedule 1 of the SARA, individuals of these species are protected from "killing, harming, harassing, capturing, taking, possessing, collecting, buying, selling or trading" (Species at Risk Public Registry 2014). Recovery or management plans are required for listed species.

Under the SARA, persons/organizations who are "required by or under an *Act* of Parliament to ensure that an assessment of the environmental effects of a project is conducted" must inform the competent minister if a project "is likely to affect a listed wildlife species" (Subsection 79(1)). Further, those persons/organizations are required to "identify the adverse effects of the project on the listed wildlife species and its critical habitat and, if the Project is carried out, must ensure that measures are taken to avoid or lessen those effects and to monitor them. The measures must be taken in a way that is consistent with any applicable recovery strategy and action plans" (Subsection 79(2)).

1.3.4 Migratory Birds Convention Act

The *Migratory Birds Convention Act* provides "for the protection [and conservation] of migratory birds through the Migratory Birds Regulations". The *Act* protects migratory populations, individuals and their nests (1994, c. 22, s. 4; 2005, c. 23, s. 3) through prohibition of:

- possession of a migratory bird or nest;
- the purchase, sale or exchange of migratory birds or nests; and
- deposition of substances into waters that is harmful to migratory birds, or in a location where the substance can enter waters, without appropriate authorizations.

1.3.5 Other Management Plans and Strategies

1.3.5.1 *The Keewatin Regional Land Use Plan*

The Keewatin Regional Land Use Plan was approved in June 2000 (NPC 2000) and it is currently the land use plan in effect in the Project area. Objectives of the plan that address mineral exploration in relation to wildlife state:

- The environment, wildlife and wildlife habitat should be protected and conserved for the use of future generations (Section 2); and
- Non-renewable resource development should have no significant adverse effects on the environment, wildlife or wildlife habitat (Section 3).

Terms applicable to terrestrial wildlife and wildlife habitat state that:

- Development activities shall be prohibited on all public lands and water within all caribou calving areas during calving season and within caribou water crossings in the Keewatin, in accordance with the terms of the DIAND Caribou Protection Measures (Subsection 2.6).
- Development activities shall be restricted near polar bear denning areas (Subsection 2.7).

1.3.5.2 *Nunavut General Monitoring Plan*

The Nunavut General Monitoring Plan (NGMP) is a general monitoring plan that is being developed by the Nunavut Planning Commission (NPC), Nunavut Tunngavik Inc., the GN, and Aboriginal Affairs and Northern Development Canada (AANDC) on behalf of the Government of Canada. The NGMP objective is to monitor the "ecosystemic and socio-economic environment in the Nunavut Settlement Area" and is a requirement identified in Article 12.7.6 of the NLCA. The plan aims to synthesize available monitoring information, identify information gaps, and facilitate the development of additional monitoring information.

1.3.5.3 *Draft Nunavut Caribou Strategy Framework (2010)*

The draft Nunavut Caribou Strategy Framework (GNDoE 2010) was prepared to "…lay the foundation for future programs and decisions affecting caribou and people whose lives are affected by caribou in Nunavut." In the draft Nunavut Caribou Strategy Framework, the GN identified several action items that it would implement in relation to human disturbance and industrial development including the following:

- **Action 3.1e**: Develop a set of general guidelines for mitigating development impacts on caribou.
- **Action 3.1f**: Develop recommendations on the methods and standards of research required to adequately monitor and mitigate impacts on caribou around sites of development.
- **Action 3.1g**: Work with industry to integrate short-term, local monitoring and mitigation activities into long-term, herd-level research programs the results of which will support future sustainable development and the management of caribou.

In the draft Strategy, the GN identifies a policy statement "While acknowledging the importance of subsistence harvesting and respecting Inuit rights to harvest as laid out in the NLCA, the GN recognizes the need to manage harvesting when necessary for the purposes of conservation, public safety or the humane treatment of animals. It is also recognized that there are numerous ways to manage harvesting which do not necessarily require regulations. Accordingly, the GN will:

- **Action 5.1b**: Work with Hunters and Trappers Organizations (HTOs), RWOs and the Elders Advisory Committee to outline a code of conduct for caribou harvesting, drawing on traditional hunting practices.
- **Action 5.1c**: Work with partners and the Elders Advisory Committee to develop programs targeted at educating youth on hunting rights and responsibilities, and harvesting ethics.
- **Action 5.1d**: Where necessary, develop herd management plans which may manage harvesting.
- **Action 5.1e**: Work with HTOs and other co-management partners to support harvest management based on the principles of IQ and Inuit systems of wildlife management as provided for under the NLCA."

1.3.5.4 *Caribou Protection Measures (DIAND 1978, in Keewatin Land Use Plan, Appendix H [NPC 2000])*

Caribou Protection Measures apply to the Kiggavik Project. The protection measures restrict:

- Activities, without approval, between 15 May and 15 June within the caribou protection areas as depicted on the 1978 'Caribou Protection Map'.
- Locations of any operation that will block or divert seasonal migrations.
- Activities that will interfere with seasonal migrations, and that those activities must cease until migrating caribou have passed.
- Activities within 10 km of designated caribou water crossings from 15 May and 1 September.

1.4 Project Terms and Conditions

The Project, if approved, will likely have a number of terms and conditions that must be addressed as part of a Project Certificate issued by the NIRB. Those terms and conditions will be integrated in the WMMP with cross-reference to various sections where those conditions are addressed. It is anticipated that the following sections of the WMMP will be expanded to integrate Project Certificate conditions if the Project is approved and a certificate is awarded.

1.5 Related Documents

Information from the following FEIS documents is incorporated into the WMMP:

- Tier 2
  - Volume 2 Project Description and Assessment Basis
  - Volume 6 Terrestrial Environment
- Tier 3
  - Technical Appendix 2M — Road Management Plan
  - Technical Appendix 2N — Borrow Pits and Quarry Management Plan
  - Technical Appendix 2P — Occupational Health and Safety Plan
  - Technical Appendix 2S — Waste Management Plan
  - Technical Appendix 2T — Environmental Management Plan
  - Technical Appendix 4C — Air Quality Monitoring and Mitigation Plan
  - Technical Appendix 6C — Wildlife Baseline Report

1.6 AREVA's Commitment

AREVA is committed to working with the Baker Lake HTO, government organizations, regulators and stakeholders to ensure that wildlife populations remain healthy and can successfully coexist with the Project through the construction, operation, final closure and post-closure phases. The WMMP is the primary management tool to achieve this. As outlined in the following sections, AREVA will provide the necessary resources (human, financial and materials) to implement and maintain the WMMP. AREVA has the capacity and authority to implement Project effects-related mitigation and monitoring actions and plans. Although AREVA will not make decisions regarding wildlife management (e.g., harvest management) they will support regional wildlife management initiatives.

1.6.1 Wildlife Specialists

The monitoring program established by AREVA requires the input of specialists to conduct many of the wildlife surveys and studies required to monitor Project effects. Throughout the life of the Project, AREVA will endeavour to hire qualified personal to conduct these studies. As practical, AREVA will encourage the inclusion/participation of local experts and individuals in the implementation of these surveys and studies.

1.6.2 Incorporation of Inuit Qaujimajatuqangit

The WMMP will incorporate IQ into the proposed mitigations and monitoring initiatives when that information is made available. The monitoring program, once established will be responsive to input and knowledge of Inuit hunters, trappers and land users through their representative organizations.

AREVA will communicate the results of the WMMP to local hunters and trappers and encourage their feedback.

2 Spatial Boundaries

2.1 Local Study Area

A local study area (LSA) defines the area that will be the focus of the majority of wildlife mitigation and monitoring effort because it is the area where most of the Project effects will occur. The LSA surrounds the Project and includes the Kiggavik and Sissons mine sites, the access road(s) and the Baker Lake Dock Site. The LSA is a 5 km buffer of all proposed Project mine site facilities at the Kiggavik and Sissons minesites, including the proposed airstrip and site haul road, and a 2.5 km buffer of the proposed access road alignments which encompasses quarry sites and the Baker Lake Dock Site. The road LSA boundary used for monitoring Project-related effects on wildlife will coincide with the road option(s) implemented.

The LSA surrounding the mine site is approximately 450 km². The preferred Winter Road LSA is approximately 561 km² and the All-Season Road option LSA is approximately 520 km².

2.2 Regional Study Area

The regional study area (RSA) is a broader area that is expected to contain all potential Project-related effects on terrestrial wildlife. Within the RSA, there is anticipated to be a gradation of Project effects from those that are directly observable, detectable and predictable at the Project footprint (e.g., loss of foraging habitat), to locations where effects are no longer present or detectable using current methods or technologies. The RSA encompasses an area within which Project-related effects to wildlife and habitat distribution and abundance can be reasonably monitored. The RSA incorporates all Project features and associated LSAs, known caribou water crossing locations along the Thelon River basin, and critical areas identified by IQ studies. The RSA also includes areas with similar conditions to those found in the Mine and access road LSAs. The size of the RSA allows the unaffected portion to be used as comparable reference areas for monitoring potential changes caused by the Project. The RSA is approximately 9,828 km². This is the area where AREVA can independently, and through the support of federal and territorial initiatives, support surveys and research initiatives that are directly related to potential Project effects on wildlife.

2.2.1 Cumulative Effects Study Area

The Cumulative Effects Study Area (CESA) encompasses a broader area beyond the RSA. This area includes the annual ranges of the caribou herds that interact with the Project. For muskox, it includes muskox management unit MX/21 which is the scale at which the muskox that interact with the Project are managed. The CESA is where AREVA can contribute to broader-scale monitoring efforts led by wildlife management authorities and partners. Contribution to those studies will

facilitate a broader information base about regional-level issues and contribute to cumulative effects monitoring and research.

3 Lessons Learned

The following section summarizes lessons learned from other northern mine sites, mostly regarding caribou. Relevant mitigations implemented at these sites to reduce adverse effects from project activities were incorporated into the environmental assessment of the Kiggavik Project and are incorporated into this WMMP.

3.1 Meadowbank Mine

Meadowbank Mine is the closest operating mine to the Project site, approximately 70 km north of Baker Lake. Meadowbank Mine produces annual monitoring reports that detail the results of caribou monitoring activities, accuracy of impact predictions, adaptive management actions, and management recommendations (Agnico-Eagle Mines Ltd. 2011).

3.1.1 Habitat loss

The threshold for habitat loss for the Meadowbank Mine was >10% of high suitability habitat within that project's RSA. Habitat loss by project activities has been mapped and as of 2013, the habitat loss is still below the threshold and is at 60% of the habitat loss that was predicted in the EIS. Habitat loss due to degradation has also been monitored through the environmental health monitoring program which measures the levels of contaminants in soil and vegetation. Monitoring results indicate that threshold levels for contaminants have not been exceeded (Agnico-Eagle Mines Ltd. 2012).

3.1.2 Movement

The Meadowbank Mine has supported collaring efforts to monitor caribou movements (migration and home range) and seasonal habitat use within the Project RSA (Agnico-Eagle Mines Ltd. 2011). An identified threshold for measuring sensory disturbance was identified as:

> "Mine related construction and operations activities will not preclude caribou and muskoxen from using suitable habitats beyond 500 m of mine buildings, facilities and roads. Threshold is unnatural caribou use patterns beyond 1,000 m."

According to monitoring results, satellite collar data, road surveys, and hunter interviews, this threshold has not been exceeded; additionally, adaptive management measures were implemented to ensure thresholds are not exceeded.

3.1.3 Mortality

The Meadowbank Mine has numerous mitigations in place to reduce the potential for project related mortalities. The threshold in the Meadowbank Environmental Assessment was one caribou per year. Since 2007, one mine related mortality of a caribou was reported. The caribou mortality was the result of a vehicle collision that occurred in 2012 (Agnico-Eagle Mines Limited 2012). Following this collision, adaptive management was used to implement additional mitigations to reduce vehicle collisions such as increased signage, additional employee awareness training, and reporting animals on the road. Caribou harvest within 5 km of the All-Season Road has increased since the Nunavut Wildlife Management Board harvest study (FEIS Tier 3, Volume 6 Terrestrial Environment, Technical Appendix 6C, Section 5.1.5).

3.2 Diavik

The information in this section is summarized from CEAA (1999); Rio Tinto (2012a; 2012b).

Diavik developed a Wildlife Monitoring Program to check the accuracy of predictions in the Environmental Assessment and to assess the effectiveness of actions that were taken to reduce impacts to wildlife. This program was developed based on information from four years (1995 – 1998) of wildlife baseline studies, community consultation, recommendations developed during the Environmental Assessment, and years of project activity monitoring. This program takes into consideration wildlife and wildlife habitat-based technical issues raised by the Environmental Monitoring Advisory Board (EMAB) and Environment and Natural Resources (ENR) during early reviews of this program.

The program was updated in 2009 and is now referred to as the Wildlife Monitoring Program. The program is a method for observation, mitigation and improving procedures for wildlife and habitat management at the mine site.

3.2.1 Habitat loss

Habitat loss for the Diavik mine was measured through habitat mapping. In 2011, the habitat loss is below the predicted habitat loss in the environmental assessment and is below the threshold. Indirect habitat loss within the zone of influence, however, has been shown to be larger than predicted during the environmental assessment. Analysis in 2005 and 2008 indicated that the zone of influence ranged from 22 to 26 km. Additional analysis indicates that the zone of influence may actually range from 14 to 40 km (CEAA 1999; Rio Tinto 2012a and 2012b). Diavik is currently in a rotation of conducting three years of aerial wildlife surveys and then not surveying for two years to reduce stress on the animals (D.Wells, 2014, pers. comm.).

3.2.2 Movement

The results from caribou monitoring show that the predictions made during the environmental assessment, with respect to the spring and fall migratory patterns and routes, appear to be as predicted.

Diavik has two main policies related to caribou/animal movement that are 1) wildlife have the right of way; and 2) If caribou are realized to be in danger, then the standard operating procedure for caribou herding is implemented to move caribou away from danger areas. There have been three events to move caribou away from project activities (airstrip, road intersection and haul road access area).

Diavik also has a red/yellow/green system on their haul roads which alerts drivers to the number of caribou in the vicinity of the road and alerts drivers to either slow down, or stop to wait for caribou to pass.

3.2.3 Mortality

There was no project-related caribou mortality reported between 1995 and 2011. However, there have been caribou deaths observed in the area, including caribou mortality from predators near the airstrip and two dead caribou located <1km from mine site on lake ice. The cause of the latter caribou deaths is unknown.

3.3 Snap Lake

The information summarized in this section is from Golder (2007; 2011).

The Snap Lake mine is a diamond mine owned and operated by DeBeers Canada Inc. approximately 220 km northeast of Yellowknife, NWT. Construction started in 2005 and mine operations reached full production in 2008. The anticipated mine life is for 20 years.

A Wildlife Effects Monitoring Program was established to comply with the various licenses and agreements for that project. The purpose of this program is to verify the accuracy of the predictions of potential impacts and to determine the effectiveness of the mitigation measures. The majority of the wildlife monitoring conducted at the Snap Lake mine is completed by De Beers onsite environmental staff, contract wildlife biologists and a representative of Lutsel K'e, NWT.

Data and analysis completed up to 2011 indicates that the effects of the Snap Lake mine on wildlife are within the predicted ranges presented in the Snap Lake Mine Environmental Assessment Report.

3.3.1 Habitat

The loss of wildlife habitat due to project activities has been mapped by both % of habitat loss and by habitat units (by hectares). As of 2011, the mine footprint was at 70% of its total predicted size. Results from the habitat mapping indicate that habitat loss due to project activities is currently below that predicted in the Environmental Assessment Report.

3.3.2 Movement

To date, caribou location and movement information has been collected during both ground- and aerial-based surveys and from collar data. Annual variation of caribou numbers and locations is high. The data collected to date has not indicated that any changes to caribou group size or density, but does suggest that caribou may be avoiding the immediate project area.

Caribou have been observed in the project area and have been herded, for animal protection, on several occasions. In 2010, caribou were near the airstrip and emulsion plant although deterrents were not required. In 2009, caribou were observed on the airstrip and were herded by staff on foot, by truck and once by a helicopter. In 2005, caribou were observed repeatedly on the airstrip during a two week period in August.

3.3.3 Mortality

No caribou mortality has been recorded to date.

4 Mitigation Strategy

AREVA acknowledges that there will be disturbances and effects on wildlife as a result of the construction, operation, and final closure and post-closure of the Project. To reduce or eliminate potential Project effects on wildlife, AREVA commits to a number of mitigation actions. Some mitigation actions are more general and apply to all Project phases and wildlife while others are more relevant to specific Project phases and particular wildlife species. Some mitigation actions are temporal and apply at certain times of the year, or in certain years when wildlife are migrating, while other mitigation actions are specific to key habitats or sensitive areas, such as nests or den sites.

It is anticipated that some of the proposed actions will require modification during the life of the Project as more information becomes available about the effectiveness of the mitigation and the response of the wildlife and habitat to Project-related disturbances. The mitigation strategy will be supported by the effects monitoring framework, described in Section 5 and outlined in Tier 3, Appendix 2T Environmental Management Plan. Results from monitoring will allow AREVA, Project regulators, and stakeholders to assess the accuracy of the predicted Project effects and the effectiveness of the implemented mitigations.

General mitigations that are applicable during all Project phases are described in Section 4.1. Mitigation actions that were incorporated into the Project design are summarized in Section 4.2. Mitigation actions relevant to reducing effects are described during the construction phase (Section 4.3), operation phase (Section 4.4), and final closure and post closure phase (Section 4.5). Mitigation actions for specific species and species groups are mentioned separately where necessary.

Where applicable for each Project phase, mitigation actions are grouped by potential effect and include: 1) loss or alteration of habitat; 2) barriers or filters to wildlife movement; and 3) increased potential for wildlife incidents and wildlife mortality. Loss or alteration of habitat includes both direct habitat loss (i.e., the habitat is removed) or indirect habitat loss through sensory disturbance (i.e., avoided areas because of Project activities). Project infrastructure has the potential to pose barriers or filters to wildlife movement (i.e., animals may avoid or otherwise delay crossing roads). Wildlife incidents may include encounters with aggressive animals or disturbing an animal from sensitive habitat, such as flushing a raptor from a nest and disturbing it to the point that the nest is abandoned. Increased wildlife mortality could result from a vehicle-wildlife collision or destruction of an animal because of human-wildlife conflict.

4.1 General Mitigation

This section summarizes the mitigations that are relevant to the majority Project phases and activities.

4.1.1 General Mitigations for Terrestrial Wildlife and Habitat

4.1.1.1 *Habitat Loss and/or Alteration*

Direct effects to wildlife habitat include the physical disturbance to the landscape (i.e., clearing) that may cause a direct displacement of wildlife using the area. Direct habitat loss will occur through Project footprint clearing. Mitigation measures proposed to reduce direct habitat loss include:

- The Project footprint will be limited to the smallest extent possible.
- Project activities will be maintained within the boundaries of the Project footprint to the extent possible.
- Natural regeneration of native vegetation in reclaimed areas will be encouraged. Top soil cleared and stored during construction will be used to reclaim disturbed sites and native vegetation will be allowed to recolonize the areas.
- Decommissioned areas will be progressively reclaimed to return disturbed areas to a natural state.

Indirect effects to wildlife habitat are associated with changes to habitat quality, which could potentially lead to wildlife avoiding suitable habitat because of disturbance in the area. Wildlife may avoid areas because of sensory disturbance (e.g., dust, noise, lights, smells and human presence), or because of changes in vegetation abundance, community diversity or quality. Mitigation measures to prevent or reduce indirect effects to wildlife habitat associated with changes in air quality (including dust) and noise and vibration are outlined in Tier 3, Technical Appendices 2M, 4C, 4E, and 4F; primary mitigation measures include:

- Dust suppression will be undertaken in dust-prone areas within the mine area during the dry periods.
- Speed limits will be enforced to reduce airborne dust created by vehicles and other equipment traffic.
- Land-based activities within a 3 km radius of active raptor nest sites will be restricted during the nesting season. Restrictions could include no stopping zones for nests along the road, and limiting new potentially disturbing activities near active nests.
- All equipment and vehicles will be properly maintained and have appropriate exhaust mufflers to reduce the amount of noise generated during their use.
- All equipment and machinery will be cleaned of foreign particles (e.g., soil and thatch) prior to initial transport to the Project site to reduce the potential introduction of invasive and/or non-native vegetation.
- During winter road use, soft spots on the winter road will be identified and avoided by vehicle traffic. Rig matting may also be used to prevent rutting and other disturbances to soils where the winter road's integrity may be compromised.

- Aircraft will fly above 610 m agl for long-range flights (>25 km), and above 300 m agl for short-range flights (<25 km), when possible, and avoid areas of known bird or caribou concentrations.

4.1.1.2 *Barriers and/or Filters to Wildlife Movement*

To minimize effects from potential barriers and to reduce the Project's effects on filtering wildlife movement, AREVA will implement the following mitigations throughout the life of the Project:

- Truck operators will be made aware of all high-use wildlife crossing areas and will be required to report any wildlife observations.
- Public traffic will be controlled along roadways.

4.1.1.3 *Wildlife Incidents and Mortality*

Occasionally, Project-related activities could lead to incidents or wildlife mortality. Mortality events could be accidental (e.g., vehicle collisions) or deliberate (e.g., to protect human life). In most cases, wildlife mortality events can be avoided through the implementation of effective mitigation measures that focus on preventing wildlife from being attracted to the Project site and preventing human-wildlife interactions through effective communication that alerts personnel of wildlife occurrence near Project site. Mitigation measures to prevent and reduce wildlife interactions and mortality events that will be implemented throughout the life of the Project include:

- AREVA employees and contractors will not feed or harass wildlife at any time.
- Develop a wildlife mortality reporting protocol.
- Project personnel will not carry firearms on-site, with the exception of a wildlife monitor, if deemed necessary.
- Vehicle operators will be vigilant and watch for wildlife near roads, and take all reasonable actions to avoid wildlife collisions.
- Vehicle operators will have knowledge of and abide by the Wildlife and Road Operation Decision Matrix (Figure 4.1).
- Traffic will stop when wildlife are observed on the road. To allow wildlife standing on the road to move off the road unalarmed, trucks will stop for 15 minutes, then proceed slowly (<20 km/hr) if wildlife have not moved within that 15 minute period (Figure 4.1).
- AREVA will direct operators to include wildlife reports in their radio communications. Truck-to-truck communication reporting wildlife presence by kilometer (e.g., "*two caribou north of road at kilometre 97*") will keep operators informed of potential hazard areas.
- AREVA will manage snow clearing so that caribou and other wildlife can easily cross the road without being deterred by steep and high snow banks.
    - When feasible, snow banks will be kept less than 1 m high or escape routes will be created at regular intervals or in areas of high wildlife use.

- Project facilities and waste disposal sites will be inspected regularly to ensure that measures to reduce scavenging are implemented and effective.
- Wildlife protection measures will be in effect throughout the life of the Pointer Lake airstrip. Procedures for detection of animals and birds will be developed. If required, ground personnel will conduct pre-landing and pre-take off runway inspections prior to each flight.
- AREVA will support mitigation measures imposed by the wildlife management authorities and/or any wildlife harvest management initiatives if monitoring determines that harvesting pressure from the road is having an adverse effect on wildlife.
- To reduce mortality risk, wildlife near misses and collisions will be reported and investigated to determine the root cause and identify corrective actions.
    - Near misses are when wildlife mortality could have occurred if immediate corrective actions were not taken.
    - Investigations will follow a standard procedure of employee interviews, scene investigation, recording time, date and incident details.
    - Corrective actions will be identified that are specific to the situation (e.g., reduce speed, improve signage, clear roadside vegetation).

Wildlife mitigation measures specific to roads are also discussed in Technical Appendix 2M.

Problem Wildlife Management

The goal of problem wildlife management is to reduce the potential for wildlife-human interaction at Project facilities. A Problem Wildlife Protocol will help to ensure employee safety and minimize potential mortality from threats to life or property.

AREVA will implement a Problem Wildlife Protocol that includes the following elements:

- Employee training.
- Employees will be required to report wildlife sightings near Project facilities.
- Warning signs will be posted in areas of frequent wildlife encounters on a seasonal basis or otherwise as required.
- Temporary area closures will be used until control measures are in place and have been activated.
- If wildlife becomes a concern, Nunavut Conservation Officer Services will be contacted for advice on appropriate actions.
- With prior approval of local Conservation Officer(s), adverse conditioning actions will be applied to problem wildlife to reverse habituation behaviors.
- AREVA will identify appropriate personnel to monitor, manage and evaluate human-wildlife conflicts.

The decision matrix for managing AREVA's response to problem wildlife is presented in Table 4.1-1.

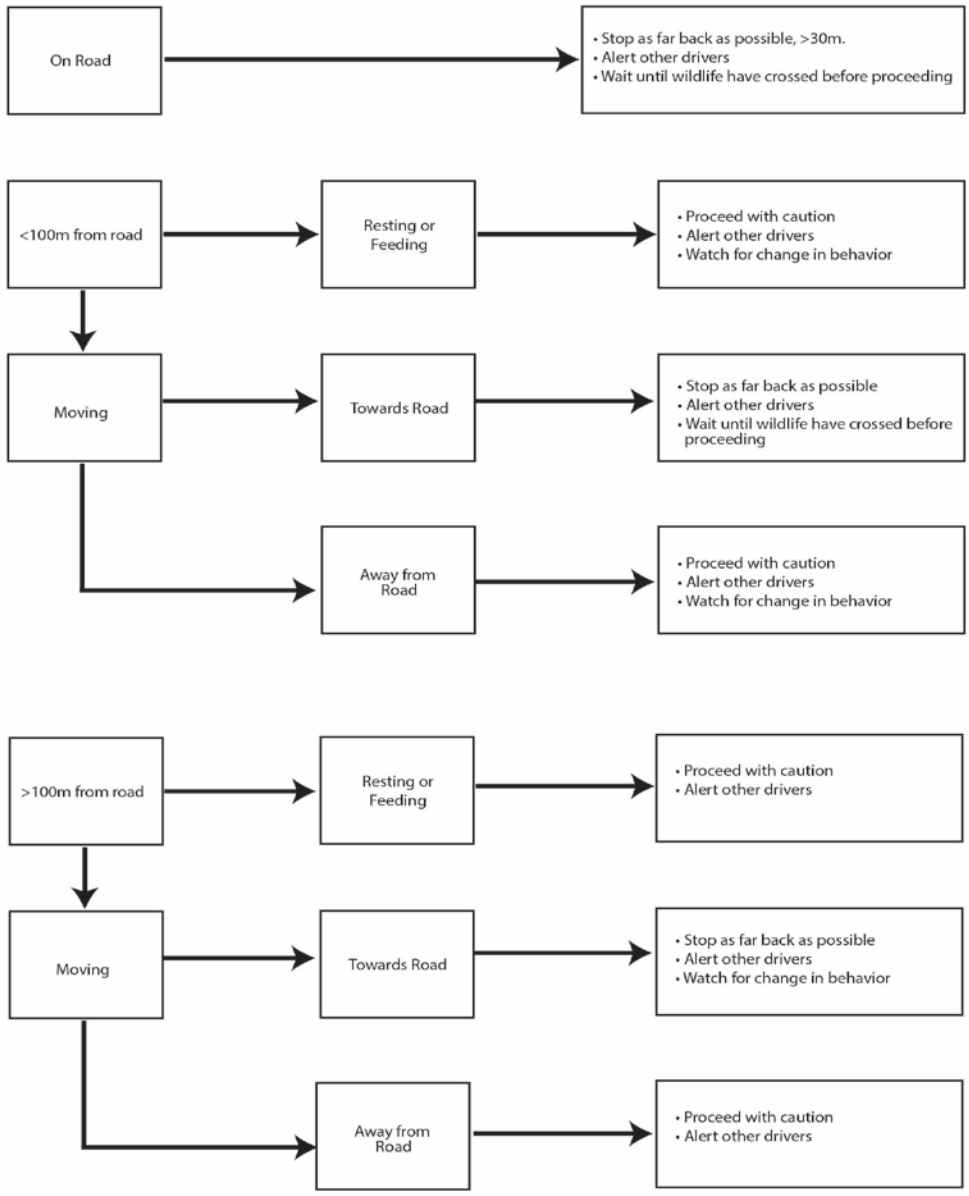

Figure 4.1 Wildlife and Road Operation Decision Matrix

Table 4.1-1. Problem Wildlife Encounter Management Matrix

Type of interaction	AREVA Management Response					
	Monitor	Post warning	Area closure	Contact Conservations Officer Services	Hazing actions	Destroy
Animal sighting reported	•					
Animal showing normal feeding behaviour	•	•				
Animal reacting defensively	•	•	•			
Animal tolerates human disturbance and ignores people and facilities	•	•	•			
Animal shows repeated interest in people and facilities that will likely lead to habituation	•	•	•		•	
Animal is clearly habituated to humans and facility	•	•	•	•	•	
Animal displays aggressive behaviour and is an immediate threat to human safety			•	•		•

4.1.1.4 *Mitigations for Caribou and Muskox*

Barren ground caribou and muskox are recognized as an important wildlife species that use habitat within the LSA and RSA. Specific mitigations for caribou and muskox, through all Project phases, include:

- During migrations, temporary shutdowns of roads will be initiated if it is determined necessary in order to allow groups of caribou to migrate through the area.
- In the event that caribou cows calve within 10 km of the Project, AREVA will not initiate new activities outside the project footprint, or increase the frequency or intensity of existing activities between May 15 and July 15.
- AREVA will minimize snowmobile, and ATV use outside camp footprint when caribou cows and calves are present between May 15 and July 15.
- Disturbance to concentrations of caribou will be avoided by maintaining minimum aircraft flying altitudes above 610 m, when possible. Aircraft altitudes will be tracked, recorded and audited using the internet-based WebSentinel program (or similar).
- No construction, fuel caching, blasting or drilling activities will occur within 10 km of a designated and/or recognized caribou crossing between May 15 and September 1 in accordance with the DIAND Caribou Protection Measures.
- In the event that caribou migrate within 2 km of the Project, AREVA will not initiate new activities, or increase the frequency or intensity of existing activities.

- AREVA will avoid conducting aerial surveys for the purposes of obtaining information on caribou.
- AREVA will implement speed limits in areas that are important to wildlife to reduce the potential for wildlife collision and to reduce sensory disturbances along the road. The speed limit will be established based on safe stopping distances and line of sight in areas of potential caribou encounters.
- Caribou will have the "right of way" and will not be blocked or deterred from moving through the Project area. All road activities that may interfere with migration will cease if caribou are observed migrating through the area.
- If caribou appear to be migrating through the Project area, the lead groups will be allowed to pass, which may encourage the remaining caribou to follow and move through the area.
- Snow management will avoid long continuous cuts or piles of snow that could restrict movement across roadways.
- The use of fencing will be minimized. When fencing is required for safety reasons, the length of fencing will be minimized where possible.

4.1.1.5 *Den Site Mitigation*

Many animals use dens for hibernation or during reproduction (natal dens). Species in the Project area that use dens include grizzly bears, wolverine, wolves and foxes. Mitigation measures specific to den sites include:

- A wildlife harassment policy will be implemented, which will instruct mine site personnel to avoid visiting or disturbing known den sites.
- Land-based activities, including blasting, within a 3 km radius of active den sites will be restricted during the denning period.
- Mine site personnel will be encouraged to report new den sites to the mine's Safety, Health, Environment, and Quality (SHEQ) Department to mitigate potential wildlife-human safety issues.
- If a new natal den is observed within or immediately adjacent to the Project footprint, additional mitigation measures will be initiated. Mitigation measures may include, but are not limited to, the following:
    - Erecting signage to reduce vehicle speeds.
    - Temporarily restricting mine site activities near the den site until the den site is no longer active.
    - Developing a den site-specific mitigation plan (which includes monitoring activities in the territory) when construction is occurring within 3 km of an active den site.
- If a grizzly bear is either observed establishing a den site believed to be for hibernation purposes, or is known to be hibernating within or adjacent to the Project footprint, the SHEQ Department will notify the GN's Regional Biologist to discuss and identify

mitigation measures to implement in an effort to avoid disturbing the animal during this sensitive period.

4.1.2 General Mitigations for Birds

4.1.2.1 *Raptors*

- Land-based activities, including blasting, will be restricted within a 3 km radius of active raptor nest sites during the breeding season. The raptor breeding season is 15 May to 15 August (Environment Canada 2014).
- To minimize the risk of abandonment, overflights of known nest sites during the breeding season is prohibited.
- For known nest sites that are within 3 km of Project activities, a nest-specific mitigation plan will be developed. This can allow operations to be modified should the breeding raptors show adverse reaction to nearby disturbances.
- A wildlife harassment policy will be implemented and will include no disturbance at raptor nest sites.

4.1.2.2 *Migratory Birds*

Currently, there are no known goose nesting, rearing, or staging areas in the RSA. If migratory bird (goose) nesting areas (colonies) are located within aircraft flight lines, then the mitigations suggested by Environment Canada will be implemented when it is safe to do so. These include:

- 1.5 km lateral buffer during nesting and brood-rearing.
- 3 km lateral buffer during fall staging.

If a migratory bird nest is found within 750 m of a work area during the nesting season (May 15 to August 15; Environment Canada 2014), environmental staff will be contacted and the appropriate no disturbance buffer around the nest will be established until fledging occurs (Table 4.1-2). If it is not feasible to maintain the recommended buffer around the nest site, nest site-specific guidelines and procedures will be developed and issued to all employees to ensure that for the duration of the activity, disturbance to that nest is minimized. Environment staff will monitor each individual case, in a manner that does not cause added disturbance to the nest, to assess the effectiveness of the nest-specific management plans. To prevent thermoregulatory stress to eggs, incubating adults will not be disturbed/flushed from their nests during inclement weather (rain, snow, cold temperatures) during June or July.

If any bird Species at Risk are found nesting within 750 m of Project activities, appropriate setback buffers will be applied, and the nests and setback buffers will be monitored by environmental staff to ensure compliance and monitor nest activity.

Table 4.1-2 Recommended Setback Distances for Activity Near Bird Nests

Species Group	Recommended Setback Distances (m)		Exceptions/Comments
	Pedestrians /ATVs	Roads/ Construction/ Industrial Activities	
Songbirds	30	100	
Shorebirds [a]	50	100	For nests of American golden plover or ruddy turnstone setbacks should be increased to 150 m for Pedestrians/ATVs and 300 m for Roads/Construction/Industrial Activities. For nests of black-bellied plover, whimbrel or red knot, setbacks should be increased to 300 m and 500 m respectively.
Terns/Gulls	200	300	For nests of Ross's gull setbacks should be increased to 500 m for Pedestrians/ATVs and 750 m for Roads/Construction/Industrial Activities. For Ivory Gull nests, a 2 km setback should be applied to all activity.
Ducks	100	150	
Geese	300	500	
Swans/Loons/Cranes	500	750	
Cliff-nesting Raptors	500	500	
Ground-nesting Raptors	400	400	Includes short-eared owl.

[a] If field crew are untrained in the identification of these species, then the higher setbacks should be applied for all shorebird species. In areas where several species are nesting in proximity, setbacks for the most sensitive species should be used if they are present.

4.2 Project Design

The Project will have residual effects on wildlife. Wildlife habitat will be removed in the long-term, and sensory stimuli during the construction, operation, and final closure phases of the Project have the potential to disturb wildlife. Several elements were considered in the Project design that will help

mitigate the effects on wildlife and wildlife habitat (see Tier 2, Volume 2, Section 4.3). This section summarizes the mitigations that were included in the Project design.

4.2.1 Habitat Loss and/or Alteration

To minimize disturbance to wildlife, and to reduce the extent of habitat loss or alteration, the following mitigations will be implemented:

- Minimizing the Project footprint is used as a criterion for selecting the proposed Project design (Tier 3, Appendix 2A, Alternatives Assessment Report).
- Project activities will occur within the boundaries of the Project footprint to minimize the direct loss of habitat and the reduction of habitat effectiveness.
- Project infrastructure is located outside of known sensitive wildlife areas (e.g., mineral licks, den sites, raptor nests) and areas with sensitive vegetation (e.g., rare plant locations).
    - Transportation infrastructure routing was selected to minimize interactions with known sensitive wildlife areas where possible.
    - Gravel/borrow pit locations were selected to minimize interactions with known sensitive wildlife areas where possible.
- Eliminating dust dispersal from the tailings management facility through subaqueous deposition of tailings.

4.2.2 Barriers and/or Filters to Wildlife Movement

To minimize effects from Project components acting as potential barriers that limit wildlife movement, AREVA has included the following mitigations into the Project design:

- AREVA will design and build roads with a low profile embankment that will reduce the potential for the road to filter, or act as a barrier, to wildlife movement (see Technical Appendix 2L).
- Where embankments may pose a barrier or filter to wildlife movement, (e.g., > 2 m high and steep slope in areas of known wildlife movement), wildlife crossings will be constructed with the following characteristics:
    - 10 to 100 m long.
    - The embankment will have a gradual grade (e.g., 5 horizontal to 1 vertical (5:1), compared to a standard 2:1 or 3:1).
    - Surface will be a finer fill to replicate natural trail conditions. Surfaces will be relatively smooth, compacted, and constructed of finer fill material (crushed rock less than 100 mm) to prevent leg entrapment.
    - Crossing areas will be placed in areas of greater wildlife movement based on observational data and caribou collar data.

- Equipment laydown areas are not located in areas of known wildlife movement, areas of known wildlife concentration (e.g., mineral licks), or near sensitive habitat (e.g., nest sites, den sites).
- No-clearing buffer zones will be established around riparian areas (e.g., rivers, creeks) to minimize disturbance to movement corridors.
- The roads from the Kiggavik and Sissons sites to Judge Sissons Lake contain a treated effluent pipeline and pipeline berm. The berm will be designed such that the pipeline can be crossed by wildlife.
- Fencing use will be limited to the extent possible to minimize changes in wildlife movement. If required, fencing may be used as a deterrent to keep wildlife away from infrastructure that poses an injury risk.

4.2.3 Wildlife Incidents and Mortality Risk

The Project has the potential to increase wildlife mortality risk through vehicle collisions, negative wildlife-human encounters, and exposure to Contaminants of Potential Concern (COPC). Mitigations in this section focus on reducing the potential for wildlife incidents and increased mortality risk.

4.2.3.1 *Road Design*

To reduce the potential for wildlife collisions and mortality on the road, AREVA will incorporate following mitigations into the design of Project roads:

- Roads will be designed with clear lines of sight and will avoid blind spots, where possible, to reduce the risk of wildlife collisions.
- Speed limits will be posted and enforced by the environmental supervisor and security personnel.
- Signs will be posted in high collision risk areas (e.g., blind or obstructed turns or hills, water crossings).

4.2.3.2 *Camp Design*

AREVA understands that attracting wildlife to the Project area can have adverse effects, both to the animals and to humans. Specific mitigations included in the Project design to reduce human-wildlife interactions and wildlife exposure to COPCs are:

- The mine buildings will be designed to discourage use by animals and prevent human-wildlife conflicts:
    - Many site buildings will be interconnected via corridors, reducing interactions between Project personnel and wildlife.
    - All buildings and stair landings will be skirted to the ground.
    - Windows will be located at all exits, where practical.

- AREVA will implement a waste management plan (see Tier 3, Appendix 2S) to reduce the potential for attracting wildlife, including bears, wolverine, foxes and other scavengers to camp facilities. This plan will include Best Management Practices for food, waste and fuel management into the design on the Project, including:
    - Storing and incinerating garbage in an enclosed area surrounded by electric fencing. The gate will remain closed at all times.
    - Installing a stack scrubber in all kitchen vents to reduce kitchen odours.
    - Storing all food and waste inside buildings or within an enclosed, bear proof area, unless field crews are working remotely. Field crew lunches will be sealed in airtight containers and all garbage will be pack out and properly disposed.
    - Burning all food and kitchen waste in an incinerator.
    - Storing all fuel in airtight containers in areas inaccessible to bears (i.e., fuel shed or fenced enclosure).
    - Training all workers in wildlife management protocols, including garbage management, bear encounter protocols.
- Audits of waste management implementation will be conducted periodically to ensure wildlife is not being attracted to the site.

The design of water management ponds and the Tailings Management Facilities (TMF), reduce the attractiveness of the facilities to wildlife, particularly waterfowl.

- The design of water management pond prevents/inhibits vegetation growth within and adjacent to ponded water.
- Decommissioning of the TMFs will involve covering tailings first with clean waste rock followed by placement of a compacted till cover (FEIS Tier 3, Volume 5, Aquatic Environment, Appendix 5J, Section 3.9.1), eliminating the TMFs as sources of ponded water.

Guidance provided in ‘Preventing Wildlife Attraction to Northern Industrial Sites’ (Environment Canada 2007) outlines the design of Project facilities and infrastructure to discourage attraction of nesting and/or predatory birds. Mitigation measures aimed at deterring birds from using site facilities for nesting, and to deter nest scavengers, include:

- Buildings will be designed to avoid/eliminate denning, roosting and nesting sites. For example: bird spikes will be installed on horizontal surfaces near heat sources. To the extent practical, AREVA will minimize the number of sheltered surfaces on buildings where nests could be established.
- Project facilities will be designed to minimize the potential for predatory or scavenging animals' use of the facilities for shelter or a source of food.
- To minimize the potential for increasing densities of bird nest predators (e.g., foxes, wolverines, ravens), AREVA will implement strict waste management procedures as

outlined in the Waste Management Plan (FEIS Tier 3, Volume 2, Project Description and Assessment Basis, Technical Appendix 2S, Waste Management Plan).

4.3 Construction

Construction is likely the most disturbing Project phase for wildlife. Construction has the potential to affect wildlife through habitat loss and alteration; changes in movement patterns; and increased risk of wildlife mortality. This section describes mitigations that will be implemented during the construction phase in addition to those listed under General Mitigations.

4.3.1 Habitat Loss and Alteration

Wildlife habitat will be removed during the construction phase mainly from clearing for the Project footprint. Human presence will increase in the area, and large equipment will used for construction. Mitigations implemented during the construction phase aim to reduce or eliminate potential effects on wildlife habitat during this time. These include:

- AREVA will avoid land clearing in sensitive areas during sensitive times, which includes:
    - The migratory bird nesting season (May 15 to August 15; Environment Canada 2014).
    - If clearing must occur during the nesting season, AREVA commits to conducting active migratory bird nest surveys prior to clearing. Survey methods will follow best practices implemented to date for other northern projects. Some aspects of these surveys include:
        - Survey teams are led by qualified individuals.
        - A no-disturbance buffer around active nests is established until chicks have fledged or the nests have been determined to have been predated or abandoned.
        - A 7-day window following the nest survey for clearing activities to be completed once the survey is conducted (in areas where no nests are found).
        - Communication of survey results and overview of protected nests with clearing contractors or on-site construction supervisor.
        - Updates will be provided as part of annual reporting.
    - If new site-specific wildlife features are discovered during construction monitoring (e.g., mineral licks, raptor nests, den sites), then they will be avoided where possible and will be addressed on a case-by-case basis. No mineral lick, raptor nest or den was found within the proposed Project footprint during baseline studies.
- Blasting will be avoided within 500 m of site-specific wildlife features, which include:

    - Active bear (October through to mid-May; McLoughlin et al. 2002) and wolf dens — which to date have not been located in these areas.
    - Raptor nests found within the footprint will be avoided where possible, and nest management plans will be developed where necessary — raptor nests have not been found within the footprint.
- Blasting activities for road construction within 3 km of known raptor nest sites will be restricted to times outside of the raptor territory occupancy and, when nests are active, nesting season (15 May to 15 August; Environment Canada 2014).

Sensory disturbances that affect habitat effectiveness within a Zone of Influence (ZOI) can only be partially mitigated. Wildlife will be disturbed by some Project activities, and the degree to which animals will adapt or habituate to those disturbances is not known. Mitigation measures that will minimize the likelihood of reduced habitat effectiveness include:

- AREVA will minimize sensory disturbances where possible throughout the year (see Tier 3, Appendix 4C Air Quality Monitoring and Mitigation Plan; Appendix 4E, Noise and Vibration Assessment; and Appendix 4F, Noise Abatement Plan). In addition, a drilling and blasting plan, and explosives management plan (Tier 3, Appendix 2B and 2C) are outlined to minimize potential effects on wildlife. This will include consideration of the restriction of blasting when caribou or other sensitive wildlife (e.g., nesting raptors) are present.

4.3.2 Barriers and/or Filters to Wildlife Movement

To minimize effects from Project components that act as potential barriers or filters, AREVA will implement following mitigation during the construction phase:

- Wildlife road crossings will be constructed of fine-grained materials in areas used by wildlife to create a good travel surface for caribou (or other wildlife) attempting to cross the road (i.e., embankment slopes and materials will not cause injury or difficulty for animals when crossing).

4.3.3 Wildlife Incidents and Mortality

The Project has the potential to increase wildlife mortality. Mitigation that will be implemented during the construction phase to reduce wildlife incidents and mortality include:

- AREVA will, when practical and not causing a human safety issue, implement a stop work policy when wildlife in the area may be endangered (i.e., risk of physical injury or death) by the work being carried out.

- Wildlife monitors will provide hazard warnings to drivers and implement road travel restrictions when high numbers of caribou (e.g., 100s) are observed within 300 m of a road.

4.4 Operation

The operation phase is the longest Project phase, with regular mining activities occurring throughout this period. Mitigations implemented during the operation phase are categorized based on the perceived effect: habitat loss/alteration, barriers and/or filter to movement and wildlife mortality. Mitigations listed in this section will be implemented during the operations phase in addition to those listed under General Mitigations.

4.4.1 Habitat Loss or Alteration

Mitigations that will be implemented to reduce effects on wildlife from habitat loss or habitat alteration during the operations phase include:

- AREVA will use dust suppression methods to manage fugitive dust emissions to minimize potential disturbances within the Project's zone of influence.
- To avoid unnecessary disturbances to wildlife, there will be no stopping or loitering in identified sensitive wildlife areas during sensitive wildlife periods. No stopping areas will have signs posted along Project roads ("No Stopping" road signs). These signs will be posted along road sections where sensitive wildlife areas have been identified.

4.4.2 Barriers and/or Filters to Movement

Throughout the life of the Project, wildlife may travel through the Project area. Project-related activities have the potential to disrupt wildlife movement. Mitigations that will be implemented during the operations phase include:

- Wildlife movement will only be disrupted by Project personnel under special circumstances, such as when aircraft are landing (i.e., herding wildlife off of the airstrip prior to aircraft landing) or if an emergency situation arises.
- Snow management will avoid long continuous cuts or piles of snow that could restrict migration across the Project footprint.

4.4.3 Wildlife Incidents and Mortality

The Project has the potential to increase wildlife mortality through vehicle collisions and negative wildlife-human encounters. Mitigations in this section focus on reducing the potential for wildlife

incidents and increased mortality during the operations phase. Mitigations that will be implemented during the operations phase include:

- Communicating presence and location of wildlife observed on-site using radios to all personnel working in the area.
- Road activity will be managed (see Section 4.1 and Figure 4.1), and when caribou are migrating through or near the Project footprint.
- Project personnel will be warned with signage and radio communication when wildlife are moving through the area.
- Speed limits will be posted and enforced on all roads and around the mine sites.

4.5 Final Closure and Post Closure

AREVA expects that after Project operations are complete and mine facilities are decommissioned that mitigation for wildlife will be passive.

4.5.1 Habitat loss and Alteration

- Disturbed areas will be progressively reclaimed to return areas to a natural state as soon as possible. Progressive reclamation activities will be on-going throughout the operations phase.
- Decommissioning of the Project will include dismantling and demolition of all site facilities, clean up and reclamation of disturbed areas, closure of the TMFs, and reclamation of mine rock stockpiles to promote vegetative growth and to provide access to wildlife (See Tier 3, Appendix 2R, Preliminary Decommissioning Plan).

5 Monitoring Framework

Monitoring of Project effects must be relevant to the possible effects which the Project will have on terrestrial wildlife and habitat. As outlined in Tier 3, Appendix 2T, Environmental Management Plan, the monitoring framework provides the means to evaluate the accuracy of environmental assessment impact predictions, inform continual improvement opportunities and identify when adaptive management measures need to be applied to the Project. The objectives of the Kiggavik Project monitoring framework are to:

- Develop a comprehensive and integrated terrestrial wildlife monitoring program, incorporating an ecosystem-based approach for monitoring and management of Project related terrestrial wildlife effects.
- Integrate IQ knowledge into the development and implementation in the terrestrial wildlife monitoring programs.
- Include the meaningful participation of regulators, Inuit organizations, and local stakeholders in the terrestrial wildlife and habitat monitoring program.
- Align the monitoring plan with regional monitoring objectives and methods to facilitate data compatibility and comparability with regional monitoring information.
- Coordinate aspects of the terrestrial wildlife monitoring program.
- Report in an effective and timely manner on the monitoring program and its results in ways that are meaningful to both regulators and stakeholders.

5.1 Monitoring Principles

The wildlife and wildlife habitat monitoring framework's objectives are guided by the following principles:

- Monitor and verify potential effects related to the Project.
- Monitor and evaluate the effectiveness of mitigation measures.
- Identify unanticipated effects.
- Monitor effects where predictions were based on limited information.
- Provide an early warning of undesirable change.
- Identify continual improvement opportunities and, where necessary, the need for adaptive management measures.

5.2 Monitoring Framework Overview

Table 5.2-1 defines the key considerations for each monitoring plan component considered in this WMMP. The table outlines the monitoring approach taken for a number of Valued Ecosystem Components (VECs) as identified by the NIRB. Monitoring is focused on measureable parameters of Key Indicators. Each monitoring component has a goal, objective, and identified thresholds for adaptive management actions. Additional items identify the scope of the monitoring work (spatial and temporal scale), agency partners, and a cross-reference to [future] Project Conditions [if the Project is approved and a NIRB Project Certificate is issued].

Table 5.2-1 Monitoring Framework: Overview and Definitions

VEC	Valued Component (e.g., Terrestrial Wildlife) — identified by NIRB, addressed in Kiggavik Project FEIS
Key Indicator	The species or relevant feature selected to represent the VEC (e.g., caribou)
Monitoring Category	One of three categories — Baseline Research, Surveillance, Monitoring
Design	e.g., Before-After Control-Impact (BACI), opportunistic
Measurable Parameter	A quantifiable feature used to assess potential effects on an indicator (e.g., movement)
Key Project Interactions	Identification of key project features that result in residual effects on the Indicator and Measurable Parameter (e.g., all weather access road as a filter to caribou (Indicator) movement (Measureable Parameter)).
Goal	Statement of the expected residual effect of the Project (e.g., the Project will have a not significant effect on caribou movement because of Project infrastructure and activities).
Objective	Evaluate a potential response specific to the mine and operations (e.g., evaluate movement patterns of caribou as they approach or cross the all-weather road).
Threshold	Early warning indicator (note: usually about an order of magnitude lower than the significance criteria used in the FEIS)
Scope of Monitoring Work	Brief overview of key components of a monitoring program including note of temporal and spatial scale, frequency, duration.
Agency/Partner Participation	Identification of regulatory agencies and local partners in the monitoring programs (e.g., Baker Lake HTO).
Mitigation Measures	A list of measures used to reduce Project-related effects (e.g., Project design elements, adjustments to operations)
Project Terms and Conditions	Indicates the Project Terms and Conditions that will be addressed [pending project approval and award of certificate] by this monitoring plan component

There are three categories of study related to monitoring and follow-up of Project-related effects:

1. **Baseline Research** — includes background studies intended to establish need for, or parameters of, an Environmental Effects Monitoring program. Research studies could address issues such as natural variability of a measurable parameter or monitoring target, or examine the nature, extent, or duration of a potential Project–VEC interaction.
2. **Surveillance** — programs to produce information about the pattern of occurrence of key indicators.
3. **Monitoring** — programs to address and quantify cause and affect linkages between Project activities and components of the receiving environment.

Wildlife species selected for monitoring focuses on the key indicator species (FEIS Tier 2, Volume 6 Terrestrial Environment, Section 11.6 Valued Environmental Components, Indicators and Measurable Parameters), with a primary focus on caribou. Monitoring efforts will focus on a variety of spatial and temporal scales, depending on the focal species and the possible effect being monitored. Most local monitoring efforts will focus studies at the scale of the Project footprint (e.g., wildlife mortality monitoring), while others will focus on larger scales to adequately quantify and/or qualify effects (e.g., changes or alteration in wildlife movement).

5.3 General

AREVA will continue to participate in monitoring programs in partnership with the Government of Nunavut, Department of Environment (GNDoE) and the Baker Lake HTO. With a positive environmental assessment and development decision, additional monitoring programs for the Project will be implemented that focus on wildlife habitat and the key wildlife indicator species. Monitoring programs that are general to all species are listed below (Table 5.3-1 to Table 5.3-3). Species or habitat-specific monitoring programs are outlined in the following sections.

Table 5.3-1 Wildlife Monitoring: Direct Habitat Loss

Indicator	All species
Monitoring category	Surveillance
Design type	Footprint survey
Measurable parameter	Project footprint (km^2)
Key project interactions	Direct habitat loss within the Project footprint (either temporary or permanent)
Objective	Quantify direct habitat loss in the Project footprint
Threshold	Habitat loss limited to the amount identified in the Project Description
Scope of monitoring work	Local monitoring: Measure area of Project disturbance on an annual basis using a ground surveys and/or aerial imagery.
Agency/partner	None required

Table 5.3-1 Wildlife Monitoring: Direct Habitat Loss

participation	
Project terms and conditions	TBD

Table 5.3-2 Wildlife Monitoring: Incidental Observations

Indicator	All species
Monitoring category	Surveillance
Design type	Opportunistic
Measurable parameter	Number and species of wildlife observations in the Project area
Key project interactions	Wildlife using habitat adjacent to or within Project infrastructure
Objective	Track wildlife observations within and adjacent to the Project footprint to monitor species occurrence
Threshold	None
Scope of monitoring work	Local monitoring: Log of wildlife observations within the RSA.
Agency/partner participation	None required
Project terms and conditions	TBD

Table 5.3-3 Wildlife Monitoring: Project-Related Mortality

Indicator	All species
Monitoring category	Surveillance
Design type	Opportunistic
Measurable parameter	Wildlife mortality
Key project interactions	Wildlife mortality due to Project activities or infrastructure
Objective	Track Project-related mortality within and adjacent to the Project footprint
Threshold	Project-related mortalities will be reviewed to determine if further action is needed
Scope of monitoring work	Local monitoring: Record of near misses, collisions, and all other observed wildlife mortalities within the RSA

Table 5.3-3 Wildlife Monitoring: Project-Related Mortality

Agency/partner participation	None required
Project terms and conditions	TBD

5.4 Caribou and Muskox

The Project interacts with caribou and muskox habitat, increases the risk of mortality, and facilities may act as a partial barrier or filter to caribou movement. Direct habitat loss, incidental observations, and Project-related mortality will be tracked along with other wildlife species as part of the general wildlife monitoring (Section 5.3). In addition, AREVA will monitor indirect habitat loss, movement, and harvest-related mortality of caribou and muskox.

AREVA will continue to participate in monitoring programs in partnership with the GNDoE and Baker Lake HTO. Specifically, these monitoring programs include:

- The Hunter Harvest Study to support the determination of total harvest by herd.
- The caribou collaring program to further understand seasonal distributions by herd.
- Support of the GNDoE-led herd delineation and population estimate survey to determine regional herd population trends.
- Project-specific caribou and muskox monitoring programs through ground-based observations.

5.4.1 Indirect Habitat Loss

Monitoring of caribou and muskox indirect habitat loss will involve two monitoring objectives: to evaluate trends in caribou and muskox distribution in the ZOI and to understand potential mechanisms of indirect habitat loss.

Evaluating trends in caribou and muskox distribution in the ZOI will be facilitated by studies at the local scale through the collection of incidental observations, but will also at the regional scale using aerial surveys or collaring programs. Additionally, dialogue with the Baker Lake HTO can provide information on the relative abundance of caribou and muskox in and around the RSA. Regional data are required to understand caribou and muskox distribution patterns because these animals select habitat at scales larger so incidental observation alone may be insufficient to detect changes in distribution.

To understand potential mechanisms of indirect habitat loss, AREVA will monitor co-incident air quality, vegetation community composition and vegetation chemistry within the predicted ZOI. (Tier 3, Appendix 4C, Air Quality Monitoring and Mitigation Plan).

Table 5.4-1 Caribou and Muskox Monitoring: Indirect Habitat Loss

Indicator	Caribou and muskox
Monitoring category	Surveillance and monitoring
Design type	Observational (collar data, Height-of-Land), opportunistic observations, Before-After Control-Impact
Measurable parameter	Distribution
Key project interactions	Indirect habitat loss from Project activities that create sensory disturbances and/or temporarily reduce the effectiveness (usefulness) of habitats adjacent to the Project footprint, or changes to the vegetation and lichen quantity or quality within the ZOI, ultimately resulting in a change in caribou and muskox distribution.
Objective	Evaluate trends in caribou and muskox distribution in the ZOI. Evaluate potential mechanisms of habitat avoidance.
Threshold	Occurrence within the ZOI equivalent to the prediction made in the Project EIS.
Scope of monitoring work	Local monitoring: Continuous log of observations from staff to document animal occurrence, and establishment of permanent sampling plots to detect changes in vegetation and lichen quality or quantity. Regional monitoring: When numbers are sufficient to provide robust statistical analysis of distribution within the ZOI, an annual aerial survey program [pending approval of GNDoE] may be implemented to document abundance and distribution of caribou in the RSA. Long-term distribution patterns as identified by a GN-sponsored caribou satellite collaring program.
Agency/partner participation	Local monitoring: AREVA employees Regional monitoring: Baker Lake HTO, Government of Nunavut, Department of Environment.
Project terms and conditions	TBD

5.4.2 Movement

Caribou monitoring will include a program looking at Project effects on caribou movement within the ZOI. Specifically, the program will:

- Identify high use trails along the selected road alignment.
- Monitor the effects of road infrastructure and operations on caribou movements through seasonal track surveys for the first 3–5 years of operation in key movement areas.

- Monitor the effects of the road, particularly road maintenance activities (e.g., snow banks) and road traffic, on caribou movements through snow track surveys, and snow bank height monitoring.
- Monitoring and documentation of road and air traffic volumes as a correlate of observed caribou activity/encounters.
- Evaluate the effectiveness of the Caribou Decision Matrix (Figure 4.1) in facilitating caribou movement across the road and preventing caribou mortality.
- Evaluate the effects of the road on caribou movements at water crossings within 10 km of the Project footprint.
- Monitoring the seasonal caribou migration prior to caribou entering the RAA as a proactive way of providing information that will advise traffic management.

See Table 5.4-2 for further details. If it is deemed necessary, additional monitoring of caribou movements could involve having wildlife monitors drive project roads once a month (when daylight allows sufficient visibility) to count the number of caribou in the area and observe movement patterns.

Table 5.4-2 Caribou and Muskox Monitoring: Movement

Indicator	Caribou
Monitoring Category	Baseline research and Surveillance
Design Type	Observational
Measurable Parameter	Movement in the ZOI
Key Project Interactions	Road structure and operations may act as a filter or barrier to the movement of caribou through the Regional Study Area
Goal	The Project will have a not significant effect on caribou movements across Project infrastructure
Objective	Evaluate movement patterns of caribou as they approach or cross the road and other Project infrastructure
Threshold	Less than 10% deflection of approaches to road and infrastructure
Scope of Monitoring Work	Local monitoring: Have an on-site wildlife monitor implement seasonal caribou track surveys; these can be ground-based (by truck on road or by snow machine beside road) to observe movement during early winter and spring seasons. In conjunction with snow track surveys monitor snow bank heights maintained at <2 m; monitor the use of snow banks by caribou along the road. Monitor and document effectiveness of the Wildlife Decision Matrix. Monitor caribou use of water crossings. Regional monitoring: Long-term movement patterns as identified by a GN-sponsored caribou satellite collaring program. This is a longer-term approach that requires analyses at a regional scale. These analyses are expected to be conducted in conjunction with the Government of Nunavut.
Agency/Partner Participation	Local monitoring: AREVA employees

Table 5.4-2 Caribou and Muskox Monitoring: Movement

	Regional monitoring: Baker Lake HTO, Government of Nunavut, Department of Environment
Project Terms and Conditions	TBD

5.4.3 Harvest-related Mortality

There is moderate confidence that the Project-related effects on caribou mortality risk will be not significant. Project-related mortality on caribou will be tracked along with other wildlife species as part of the general wildlife monitoring (Table 5.3-3). Additionally, AREVA will monitor the potential for increased caribou mortality as an indirect result of the Project through possible increased access to the area (Table 5.4-3). This will be accomplished through tracking the number of hunters passing through and using the camp, and through continued participation in a multi-year hunter harvest study that includes a summary of annual caribou harvest in the region (FEIS Tier 3, Volume 6 Terrestrial Environment, Appendix 6C, Section 5.1.5 Hunter Harvest Data). The current hunter harvest study is already partly sponsored by AREVA and completed in cooperation with Agnico Eagle Mines Limited.

Table 5.4-3 Caribou Monitoring: Harvest-related Mortality

Indicator	Caribou
Monitoring Category	Surveillance
Design Type	N/A
Measurable Parameter	Mortality risk
Key Project Interactions	Caribou mortality risk may increase as an indirect result of the Project through increased harvester knowledge of and access to the area.
Goal	The Project-related effects on caribou mortality risk will be not significant.
Objective	Quantify caribou mortality risk in the RSA caused by increased harvesting knowledge.
Threshold	Exceeding the herd's Total Allowable Harvest.
Scope of Monitoring Work	Local monitoring: Log of hunters passing through and using the camp. Regional monitoring: multi-year hunter harvest study, which includes a summary of annual caribou harvest and, if possible, harvest locations.
Agency/Partner Participation	Local monitoring: Baker Lake HTO, AREVA employees Regional monitoring: Government of Nunavut, Department of Environment, Nunavut Wildlife Management Board, Agnico Eagle Mines Limited
Project Terms and Conditions	TBD

5.5 Wolves and Grizzly Bear

AREVA will monitor the Project footprint on an annual basis to determine changes in footprint area and the corresponding change in habitat availability (Table 5.3-1). No active dens were identified within the proposed Project footprint during baseline studies; however, the identification of new active dens within 3 km of the Project will initiate observational den monitoring (Table 5.5-1). Behavioural observations can improve knowledge about wolf and grizzly bear responses to mining-related disturbances and denning behaviour.

Table 5.5-1 Wolf and Bear Monitoring: Den Occurrence and Occupancy

Indicator	Wolf and Grizzly Bear
Monitoring category	Surveillance
Design type	Observational and opportunistic
Measurable parameter	Den occupancy
Key project interactions	Possible disturbance at den sites due to construction or operations-related disturbances
Objective	Evaluate trends in den use within a 3 km Zone of Influence
Threshold	Successful use of dens that are established within the Zone of Influence
Scope of monitoring work	Local monitoring: Reporting from Project staff to opportunistically identify dens near project infrastructure. On-site monitors will document the use of active dens using ground-based observations. If wolf dens are found, then collect behavioural observations (likely focal-animal sampling) to document wolf responses to Project disturbance.
Agency/partner participation	Local monitoring: Government of Nunavut, Department of Environment
Project terms and conditions	TBD

5.6 Birds and Other Species at Risk

5.6.1 Nesting Birds and Bird Species at Risk

To the extent possible, pre-clearing of areas of infrastructure development within the project footprint will occur outside of the migratory bird nesting season (May 15 to August 15; Environment Canada 2014). If clearing must occur during the nesting season, active nests for species such as short-eared owls and other possible tundra-nesting birds will be located with pre-clearing active migratory bird nest surveys prior to habitat clearing activities. If nests are found within designated set-back

distances (Table 4.1-2), no-disturbance buffers will be established and there will be no Project-related disturbances in those areas until nesting and fledging is complete.

Although AREVA is confident that Project will have a not significant effect on migratory songbirds and shorebirds within the RSA, there is a commitment to assisting the Canadian Wildlife Service in regional baseline research and monitoring. The monitoring program includes AREVA's support to complete up to 20 PRISM plots conducted within the RSA every five years (Table 5.6-1).

Table 5.6-1 Migratory Bird Monitoring: Songbirds and Shorebirds

Indicator	Shorebirds and Songbirds
Monitoring Category	Baseline research
Design Type	PRISM plots
Measurable Parameter	Abundance and density
Key Project Interactions	Habitat loss and sensory disturbance due to Project activities
Goal	The Project will have a not significant effect on songbird and shorebird abundance and density within the RSA. There is high confidence in this prediction. Follow-up monitoring is not required.
Objective	Contribute to baseline knowledge of songbird and shorebird distribution and abundance in the Eastern Arctic.
Threshold	No thresholds identified — this is a contribution to regional baseline research and monitoring.
Scope of Monitoring Work	Regional: 20 PRISM plots every 5 years
Agency/Partner Participation	Regional: Canadian Wildlife Service
Project Terms and Conditions	TBD

5.6.2 Wolverine

Wolverine observations in the Project are will be monitored on an incidental basis as noted in Table 5.3-2. No specific surveys are suggested at this time. Based on experience from other mine sites, wolverines are attracted to developments because of improper food waste management practices. AREVA has an effective waste management plan that will make wolverine-project interactions unlikely. AREVA will participate and provide in-kind support for regional-level government wildlife management monitoring to a better understanding of baseline abundance of wolverine in the region.

5.6.3 Peregrine Falcon

AREVA is moderately confident that Project effects on peregrine falcon are not significant. No active raptor nest sites were identified within the proposed Project footprint during baseline studies; however, some nest sites are close to the All-Season Road alignment. If the All-Season Road option is implemented, monitoring of all peregrine falcon nest sites within the All-Season Road LSA (Table 5.6-2) will occur on an annual basis to identify occupancy (early nesting period) and productivity (pre-fledging) to assess potential effects on cliff-nesting raptors. Survey results for nests in proximity to the All-Season Road footprint will be compared with results from other portions of the RSA and with baseline findings to assess potential effects on peregrine falcon occupancy and productivity.

Table 5.6-2 Distance of known raptor nests from the Proposed All-Season Road

Nest ID	Species	Year Active	Distance to Project facilities (m)
RN1	Peregrine Falcon	2008, 2009	269
RN2	Peregrine Falcon	2008, 2009	1,278
RN3	Peregrine Falcon	2008, 2009	1,131
RN4	Peregrine Falcon	2008	3,384
RN5	Rough-legged Hawk/Peregrine Falcon	2008/2009	3,430
RN8	Peregrine Falcon	2008, 2009	1,709
RN9	Peregrine Falcon	2008, 2009	2,014
RN10	Unknown	Na	111
RN11	Peregrine Falcon	2009	4,701
RN12	Unknown	Na	411
RN13	Unknown	Na	332
RN14	Unknown	Na	2,357
RN15	Peregrine Falcon	2009	2,302

Table 5.6-3 Peregrine Falcon Nesting

Indicator	Peregrine Falcon
Monitoring Category	Baseline Research and Surveillance
Design Type	Before-After Control-Impact (BACI)
Measurable Parameter	Occupancy and productivity
Key Project Interactions	Sensory disturbances generated from various Project activities
Goal	The Project will have a not significant effect on Peregrine Falcon occupancy and productivity
Objective	To quantify Peregrine Falcon occupancy and productivity within the RSA
Threshold	Less than a 10% difference in near-site and far-site occupancy and productivity averaged over three consecutive years
Scope of Monitoring Work	Local monitoring: Annual surveys to determine occupancy and productivity of peregrine falcons
Agency/Partner Participation	Local monitoring: Government of Nunavut, Department of Environment
Project Terms and Conditions	TBD

6 Personnel Training

Project personnel (employee and contractor) awareness programs will help to mitigate potential effects on wildlife by increasing personnel awareness of AREVA's commitment to wildlife and wildlife habitat protection in the Project area. Personnel will receive an orientation on basic wildlife ecology relevant to the Project. Those personnel that are road users will receive training specifically focused on wildlife use of the road corridor, potential wildlife mortality risks, and road and traffic operation procedures that are established to mitigate effects on wildlife. Project personnel will be expected to comply with the direction provided by mine management and there will be enforcement of Project-specific wildlife provisions.

AREVA commits to incorporating a wildlife awareness component to the on-site employee orientation program. The wildlife awareness component will include a presentation on the importance of wildlife protection around the Project and in the region. Topics that will be covered during the site orientation include:

- No feeding or harassing wildlife policy;
- Wildlife encounter directives;
- Awareness training regarding the importance of avoiding known and reporting new nest and den sites;
- Road driving directives including speed limits, driving during winter, expected areas of wildlife occurrences;
- Reviewing relevant sections of the waste management plan regarding proper disposal of food items and other refuse that may attract wildlife;
- Wildlife right-of-way policy; and
- Reporting wildlife observations and encounters.

All AREVA employees and contractors will be given training on how to respond to encounters with wildlife on and around the site that is safe for both humans and wildlife. Safety training specific to bears and other carnivores will be included in the overall training regarding encounters with wildlife.

7 Adaptive Management

Monitoring will be completed by AREVA environmental personnel and in some instances in collaboration with organizations such as the Baker Lake HTO and the GNDoE. The primary purpose of the monitoring program is to track potential changes to wildlife and habitat over the life of the Project, with a focus on the predicted environmental effects described in the FEIS. Surveys will be completed on a regular schedule following standardized protocols and procedures developed for the Project.

The process by which this is achieved is outlined in Tier 3, Appendix 2T, Environmental Management Plan. The IMS outlines how facility design, environmental assessment commitments and conditions, and management, mitigation and monitoring plans are integrated into facility construction, operation and decommissioning. The IMS facilitates the identification of continual improvement initiatives and adaptive management requirements, when necessary. The IMS is consistent with the IQ concept of Pilimmaksarniq/Ayoikyumikatakhimanik; skills must be improved and maintained through experience and practice (Nunavut Wildlife Act 2012-11-06).

It is anticipated that the WMMP will evolve and be adjusted to incorporate practical and workable solutions to minimize Project effects on wildlife and support regional wildlife research and management initiatives. The changes may be a result of inadequacies in the sampling methods or from increased awareness of environmental personnel, regulators, Inuit, or other public concerns.

8 Quality Control

Quality control will occur through the development of technical procedures that will be incorporated into the final WMMP. These procedures will provide consistency in study design, field methods, data collection and data input. The technical procedures will be periodically evaluated for effectiveness during the monitoring program, which will be used to modify techniques for assessing and mitigating Project-related effects on wildlife.

9 Reporting

It is anticipated that reporting of monitoring program results will occur in a manner consistent with the frequency with which individual components of the WMMP are completed and distributed to regulatory authorities on an annual basis. Comparisons of the wildlife monitoring results to the predicted effects identified in the FEIS will be undertaken as outlined in the Environmental Management Plan (Tier 3, Appendix 2T). This process provides a means to communicate and elicit feedback and direction on WMMP.

Annual monitoring reports will generally include the following items:

- Summary of annual Project activities;
- Description of updates to relevant wildlife baseline information — either collected by AREVA or other inventories/research known to AREVA;
- Review of annual monitoring results relative to levels of natural variability in the region (as described in the baseline report and new knowledge gained through successive annual reporting);
- Presentation of the analyses of wildlife distribution and abundance in relation to Project facilities;
- Description of stakeholder involvement (e.g., Inuit, governments, Baker Lake HTO);
- Summary of key monitoring initiatives, if necessary; and
- Discussion of proposed changes to the WMMP, if necessary.

As outlined in the Environmental Management Plan, (Tier 3, Appendix 2T) AREVA will integrate the results of the WMMP monitoring every three to five years and report the following information:

- Examination of trends in variability of wildlife distribution and abundance relative to natural trends;
- Analysis of measured wildlife responses to Project-related disturbances, including habitat use and measures of barriers/filters to wildlife movement;
- Detailed analyses of supporting variables as identified in individual monitoring programs that support the interpretation of effects on wildlife and wildlife habitat;
- Description of proposed changes to monitoring programs, statistical procedures or mitigation activities based on the analyses; and
- Description of how Project effects monitoring contributes to cumulative effects monitoring in the region.

10 References

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