AREVA

AREVA Resources Canada Inc.

KIGGAVIK PROJECT

WILDLIFE MITIGATION AND MONITORING PLAN

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1 INTRODUCTION

This document provides the Wildlife Mitigation and Monitoring Plan (Plan) for the Kiggavik Project (Project), including activities related to baseline data collection for the preparation of an Environmental Impact Statement (EIS). The Plan addresses lessons learned during the 2007 field season, previous recommendations and questions regarding AREVA's application for a Land Use Permit by Durey (2007), the Government of Nunavut (GN), Department of Environment (GNDOE 2007), Environment Canada (EC 2007), and the Beverly Qamanirjuaq Caribou Management Board (BQCMB 2007). Mitigation and monitoring plans are also based on the experience and knowledge obtained from baseline studies and wildlife effects monitoring programs at the BHP Billiton Ekati Diamond Mine, Diavik Diamond Mine, and the De Beers Snap Lake Project in the Northwest Territories (NWT), and the Jericho Diamond Mine and Doris North Gold Mine Project in Nunavut. The Plan may be adjusted based on site specific data collection and results. The Plan was designed to increase the current understanding of wildlife interactions with human development, and the effectiveness of mitigation measures. The Plan is conducted under the direction of a biologist – currently John Virgl of Golder Associates.

1.1 General

Pre-feasibility work in 2007 was focussed on diamond drilling, ore and waste rock sampling in the Kiggavik and Sissons areas in order to improve the understanding of the known mineral deposits. It also included some geotechnical logging and some ground temperature measurements.

Exploration geological work in 2007 was focussed on preparation for the 2008 diamond drilling program. It included three weeks in the field in order to evaluate previous drilling on the Bong and Granite grids, as well as some regional outcrop visits. In addition to core relogging and outcrop visits, sampling for clay species using spectrometry methods was undertaken.

The aim of the geophysics work was to better highlight gravity anomalies on the property using an airborne gravity gradiometry (AGG) survey. An initial test in the south of the property concluded that the data was indeed high-quality and the survey continued. As a result of significant delays due to weather, caribou mitigation and fuel shortages, the survey was not completed in 2007, and will be continued in 2008.

Environmental baseline work in 2007 was focussed on aquatic, terrestrial, wildlife and hydrological assessments.

All operations and personnel were conducted out of the Kiggavik camp and were supported by helicopter services. In 2007, the camp accommodated up to 32 persons. Main project contributors were as follows:

Activity	Contributors
Management	Areva
Drilling	Bradley Bros
Geological logging and probing	Areva
Ore and waste rock sampling	Areva
Geotechnical logging	SRK
Thermistors installations	SRK
Environmental Baseline Work	Golder
Wildlife Monitoring	Areva & Community
Helicopter	Forest Helicopters
Environment, Health and Safety	Areva & Senes
Occupational First Aid & Catering	1984 Enterprises
Camp renovation	SK Construction, NPS & BLCS / Baker Lake
Fuel Transportation	Peter's Expediting

1.2 Scope of Work For 2008

The 2008 field program is relatively similar to the activities conductied during the 2007 program; consisting of diamond drilling and environmental baseline studies to improve the understanding of the Project site and the known mineral deposits. The intent of the Project is to gather information required to determine whether these deposits can be safely and economically extracted and processed, while protecting the environment. A program of prospecting, geological mapping and geophysical surveys will also be carried out throughout the lease areas to identify the potential for additional mineral deposits and to further evaluate known potential areas.

The 2008 program is tentatively scheduled to begin in April or May when new building and construction material will be moved to the Kiggavik camp from Baker Lake. It is expected that the drill and environment crews will be mobilized to the site during May and June. The program is expected to be shut down and prepared for the winter season by the end of September or beginning of October. All operations and personnel will be conducted out of the Kiggavik camp and will be supported by helicopter services. The maximum number of people at the camp will be approximately 50 in 2008.

1.3 Lessons Learned in 2007

Caribou Monitoring Results

As part of the monitoring program, independent wildlife monitors completed aerial and ground-based caribou surveys to determine the presence of caribou near exploration activities for the Project. Daily and weekly aerial surveys were completed within the Project area from July to September, 2007. Daily high-level (>300 m) reconnaissance surveys were completed in June and July to determine the presence of wildlife within 3.5 km of drilling activities. For the remainder of the field season, daily reconnaissance surveys were conducted during regular air transport of field personnel.

Weekly aerial surveys were flown by helicopter to determine the number, distribution, and group composition of caribou and muskoxen within the Project area. Surveys were completed within two survey blocks (20 km x 20 km) centered on the Kiggavik Lease and Sissons Lease. To limit the disturbance from aircraft on caribou, surveys were only completed in the block containing drilling operations (i.e., only one block was ever surveyed at one time). From July to September, a total of eight surveys were completed, which were typically flown at 150 m above ground level. Five of these surveys were flown in a north-south direction following a predetermined flight path using Global Positioning System (GPS) co-ordinates (i.e., systematic survey). Three surveys were flown in a circular pattern within the survey block (i.e., non-systematic survey).

All caribou and muskoxen within 600 m of either side of the helicopter were counted and the GPS location of groups, group size, group composition, dominant behaviour of the group, and habitat type were recorded. The composition of the groups was classified as nursery (groups with calves) or non-nursery (groups without calves). Dominant behaviour of the group was classified as feeding, bedded, standing, walking, trotting, or running.

Weekly aerial survey results for the five systematic surveys are presented in Table 1.3-1. Nineteen groups of caribou were observed during the surveys. Group size ranged from one to nine, and 95% did not contain calves (i.e., non-nursing). The majority of the caribou observed were either standing, feeding or bedded (67%), while 33% were moving (i.e., walking, trotting or running). Ten groups of muskoxen were also documented during the surveys. Group size ranged from 1 to 28 individuals, and 25% contained calves. A large proportion of muskoxen groups were feeding, bedded, or standing (90%).

Table 1.3-1
Weekly Aerial Survey Results for Caribou and Muskoxen

Survey Date	Surface Lease	Species	Number	Group Composition	Dominant Behaviour
10-Aug-07	Kiggavik	Muskoxen	1	non-nursing	walking
10-Aug-07	Kiggavik	Muskoxen	2	non-nursing	feeding
10-Aug-07	Kiggavik	Muskoxen	14	nursing	feeding
10-Aug-07	Kiggavik	Muskoxen	2	non-nursing	feeding
19-Aug-07	Kiggavik	Muskoxen	1	non-nursing	standing
19-Aug-07	Kiggavik	Caribou	1	non-nursing	running
28-Aug-07	Kiggavik	Caribou	1	non-nursing	standing
28-Aug-07	Kiggavik	Muskoxen	28	nursing	feeding
28-Aug-07	Kiggavik	Caribou	2	non-nursing	standing
28-Aug-07	Kiggavik	Caribou	3	non-nursing	feeding
28-Aug-07	Kiggavik	Muskoxen	1	non-nursing	standing
05-Sep-07	Sissons	Muskoxen	1	non-nursing	standing
05-Sep-07	Sissons	Muskoxen	1	non-nursing	standing
05-Sep-07	Sissons	Muskoxen	3	non-nursing	bedded
05-Sep-07	Sissons	Caribou	3	non-nursing	standing
05-Sep-07	Sissons	Caribou	1	non-nursing	walking
21-Sep-07	Sissons	Caribou	9	non-nursing	not recorded
21-Sep-07	Sissons	Caribou	5	nursing	not recorded
21-Sep-07	Sissons	Caribou	1	non-nursing	not recorded
21-Sep-07	Sissons	Caribou	5	non-nursing	not recorded
21-Sep-07	Sissons	Caribou	5	non-nursing	not recorded
21-Sep-07	Sissons	Caribou	1	non-nursing	not recorded
21-Sep-07	Sissons	Caribou	4	non-nursing	not recorded
21-Sep-07	Sissons	Caribou	1	non-nursing	not recorded
21-Sep-07	Sissons	Caribou	9	non-nursing	not recorded
21-Sep-07	Sissons	Caribou	2	non-nursing	not recorded
21-Sep-07	Sissons	Caribou	9	non-nursing	not recorded
21-Sep-07	Sissons	Caribou	2	non-nursing	not recorded
21-Sep-07	Sissons	Caribou	2	non-nursing	not recorded

Because weekly surveys completed on July 21, July 27, September 9, 2007 were completed in a non-systematic manner (i.e., circular pattern), the results are considered as incidental observations. Incidental observations included all wildlife and groups of caribou off-transect or outside the survey block for both systematic and non-systematic aerial surveys (Table 1.3-2). During the surveys, grizzly bears were documented on two separate occasions, in addition to an inactive den located approximately 8.5 km south of the camp. Three groups of caribou comprising a total of 8 individuals were observed off-transect. No calves were present within these groups. Six separate observations of muskoxen were recorded off-transect, with 50% of these groups containing calves.

Table 1.3-2
Incidental Observations Recorded During Weekly Aerial Surveys

Survey Date	Surface Lease	Species	Number	Group Composition	Behaviour/Comments
21-Jul-07	Kiggavik	Muskoxen	1	non-nursing	feeding
21-Jul-07	Kiggavik	Arctic Fox	1	n/a	running
27-Jul-07	Kiggavik	Muskoxen	17	nursing	walking
27-Jul-07	Kiggavik	Muskoxen	1	non-nursing	bedded
27-Jul-07	Kiggavik	Caribou	2	non-nursing	running
19-Aug-07	Kiggavik	Muskoxen	22	nursing	bedded
28-Aug-07	Kiggavik	Muskoxen	16	nursing	standing
28-Aug-07	Kiggavik	Grizzly Bear	1	n/a	inactive den
05-Sep-07	Kiggavik	Grizzly Bear	1	n/a	walking
05-Sep-07	Kiggavik	Muskoxen	1	non-nursing	standing
05-Sep-07	Kiggavik	Grizzly Bear	1	n/a	walking
09-Sep-07	Sissions	Caribou	1	non-nursing	walking
09-Sep-07	Sissions	Caribou	5	non-nursing	not recorded
09-Sep-07	Sissions	Bald Eagle	1	n/a	flying

Ground-based monitoring completed by the independent wildlife monitors recorded the presence of caribou and muskoxen (and other wildlife) in the vicinity of the camp and drilling operations from June through September. These incidental observations included information on group size, group composition, and dominant behaviour. For caribou, 81 groups were observed, ranging in size from 1 to 19 individuals. Most of the groups (84%) did not contain calves, and 56% of the groups were feeding, bedded, or standing at the time of observation. Nineteen groups of muskoxen were observed, and ranged in size from 1 to 20 individuals. Groups with calves comprised 58% of the observations, and 58% of the groups were feeding, bedded, or standing at the time of observation. Other observations included four separate records of grizzly bears, and a single wolverine sighting. Incidents are defined as any wildlife interaction that requires a response by Project personnel, and may include simple deterrent measures, to the injury or death of an individual. In 2007, there were no wildlife incidents associated with the Project.

AREVA is proposing to discontinue the daily high-level (>300 m) aerial reconnaissance surveys used in June and July, 2007. During the 2008 drilling program, AREVA proposes to monitor approaching caribou with the use of satellite collar information in conjunction with daily ground surveillance for caribou cows and calves, and observations during transport of contractors and site staff (see Section 3.1 and 5.1.1). If caribou or muskoxen are observed with these monitoring methods, then applicable mitigation measures will be implemented.

In 2008, weekly aerial surveys to monitor caribou within the Project area (mineral leases) will not be conducted. Instead, aerial surveys for caribou (and muskoxen) will focus on collecting baseline data to fulfill the expected requirements for an environmental impact assessment (see Section 5.1.2).

2 WILDLIFE MITIGATION AND MONITORING PLAN

During the 2007 field season, AREVA implemented a Wildlife Mitigation and Monitoring Plan for caribou, and other wildlife that are seasonal or annual residents of the Project area. The Plan was based on information gathering and discussions between regulators and community concerns.

Updates and changes to continually improve the Plan are made and directed for site-specific activities and actions. All worksites need to be made aware of the proper procedures required to help enforce the Plan. Current worksites for the 2008 field season include:

- Camp Activities
- Drilling Operations
- Airborne Geophysics
- Ground Geophysics and Exploration Activities
- Environmental Background Work

For site-specific work operation procedures, see APPENDIX III - 2008 Worksite Specific Wildlife Mitigation and Monitoring Program

2.1 Caribou Mitigation

Based on information from the BQCMB (2006), the calving grounds for the Beverly and Qamanirjuak herds are approximately 70 km and 200 km from the proposed exploration areas, respectively. The distance between the Kiggavik camp and the nearest caribou water crossings is 25 km. During previous exploration activities, AREVA staff and contractors have observed several caribou per day traveling through the Judge Sissons Lake area. AREVA recognizes that there is a high probability that caribou will occur within the Project area during the northern and post-calving migration periods (i.e., April through September).

The following outlines caribou protection measures required or suggested during specific periods of the year and AREVA's follow-up action.

May 15 to July 15:

- No activity to be conducted within Caribou Protection Areas without approval

  - AREVA is not currently conducting any activities within Caribou Protection Areas

April through September:

- Caribou have the "right-of-way", and will not be blocked or deterred from moving through the Project area.
  - AREVA enforces this as a site rule.
- In response to AREVA's 2007 permit applications the following recommendations were made:
  - EC (EC 2007) recommends that aircraft fly at a minimum altitude of 610 m; and
  - GN (GNDOE 2007) recommends a minimum flying altitude of 300 m.
    - AREVA proposed a flight procedure in the 2007 version of the Plan and it was accepted.

May and August:

- GN (GNDOE 2007) requested that AREVA employ a fully independent wildlife monitor at the Project.
  - AREVA has employed independent wildlife monitors from Baker Lake (Martin Kreelak and Elijah Amarook).
- GN requested AREVA to suspend all operations or activities if calves and cows are present within 10 km of the exploration activities.
  - To reduce the 10 km radius to a 500 m radius, AREVA presented rational and developed a progressive approach to mitigate exploration activities and protect caribou.(a 1km radius was ultimately agreed upon)
  - To avoid injuries to caribou and humans, if 50 or more caribou approach within 1 km of drilling operations and other Project activities, then activities were suspended until caribou left the area and opportunistic ground-based behavioural observations were conducted.
- GN (GNDOE 2007) requested that AREVA will commit to not drilling within 5 km of designated caribou crossings, and not construct a camp, cache fuel, or operate ground, air, or water transportation equipment within 10 km of designated caribou crossings.
  - AREVA is committed to this request.

June and July:

- GN recommended that AREVA conduct daily high altitude (>300 m) aerial reconnaissance surveys for caribou within a 20 km radius of exploration activities. If caribou are detected within 10 km of exploration activities, then activities are to be suspended (GNDOE 2007).

    - Daily aerial reconnaissance surveys were conducted during the 2007 field season.

3 MITIGATION FOR 2008 EXPLORATION PROGRAM

The major activities for the 2008 field season include ground geophysical and geological programs, airborne geophysical programs, drilling programs, and camp operations. All of these activities have primary impacts that may include the following:

- helicopter noise during flights, drop offs and pick ups;
- ground encounters;
- equipment noise (i.e., snowmobiles, ATV's, drills, generators); and
- low-level flying.

3.1 Mitigation Procedures for Caribou

The following procedures are practiced and enforced on site to mitigate potential impacts from exploration activities on caribou.

- Caribou have the "right-of-way" and are not blocked or deterred from moving through the Project area
- For long-range transportation flights and when travelling over large concentrations of caribou (50 or more individuals in close proximity to one another), the normal practice is to fly all aircraft at a minimum of 610 m above ground level. Exceptions may exist during take off and landing, low-level ceiling conditions, high winds, or other risks to flight safety.
- For relatively shorter transportation flights (e.g., movement of staff and equipment between camp and ore bodies within the Kiggavik lease), the normal practice is to fly all aircraft at a minimum of 300 m above ground level. Exceptions may exist during take off and landing, low-level ceiling conditions, high winds, or other risks to flight safety.
- Taking-off or landing of aircraft does not occur if 50 or more caribou are in close proximity to one another and within 1 km of the aircraft.
- Track logs of helicopter flights are maintained.
- During the months of operations, AREVA employs a fully independent monitor (from the community of Baker Lake) to conduct aerial and ground-based caribou surveys (see Section 5), and to determine the presence of cows and calves near exploration activities. The wildlife monitor interacts daily with the Facility Supervisor to plan activities, and can report back to the community and regulators on the effectiveness of mitigation and monitoring.

- AREVA is committed to not drilling within 5 km of designated caribou crossings and not to construct a camp, cache fuel, or operate ground, air and water transportation equipment within 10 km of designated caribou crossings.
- Rather than continuing with the daily aerial reconnaissance (>300m) surveys that were conducted during the 2007 season, AREVA is proposing the following:
    - Monitoring the area for approaching caribou with the use of satellite collar information in conjunction with daily ground surveillance for caribou cows and calves, and observations during transport of contractors and site staff (following the flight altitudes for transportation described above).
    - If a collared caribou is identified as being on the lease property or within 4 km, then verification will occur through an aerial reconnaissance survey (>300 m).
- AREVA agrees to suspend all operations in accordance with *Technical Procedure – Mitigation Measures for Caribou within 1 km of Drilling Operations* (drilling, operation of ATVs, snowmobiles and water craft) if calves and cows are present within 1 km of exploration activities (50 or more individuals in close proximity to one another).
- Aerial surveys and ground-based surveys will include an independent wildlife monitor.
- Adherence to all mitigation and protection measures described for "Other Wildlife" by all site employees, contractors, and visitors.

Required activities and their applicable frequencies and flying altitudes are presented in the following table:

Activity	Frequency	Flying Altitude
Regular Long Distance Flights		>610 meters
Short Distance Flights		>300 meters – if achievable during duration of flight
Aerial Reconnaissance Surveys*	When required	>300 meters
Aerial Surveys (collecting scientific baseline data) **		200 meters
Ground Behavior Observations	Daily	NA
Wildlife Log-Book	On event of viewing wildlife	NA
Aerial Geophysical Surveys – Reconnaissance	Prior to conducting survey	>300 meters
Aerial Geophysical Surveys	As required	120 meters

*** If required, as per collared satellite data**

**** Discussed in Section 5 Caribou Monitoring and Baseline Data Collection**

3.2 Mitigation Procedures for Raptors and Other Migratory Birds

AREVA has implemented the following operating procedures to mitigate potential impacts to raptors and other migratory birds.

- Any land clearing activities (if necessary) will be conducted during late winter (April) outside of the nesting season (May through August) for migratory birds.
- Avoid disturbance to the nest sites of raptors and other migratory birds (i.e., songbirds and shorebirds). If a raptor nest is located incidentally within 1.5 km of exploration activities, then AREVA staff and contractors will be instructed to specifically avoid the nest site during late May through mid-July, and maintain a distance of at least 100 m from the nest during mid to late August (as recommended by the GN [GNDOE 2007]).
- An attempt will be made to prevent birds from nesting on man-made structures.
- If a nest site is established on a man-made structure and eggs are present, the nest will be avoided as much as possible and monitored for nest success.
- Adhere to all mitigation and protection measures described for “Other Wildlife”.

3.3 Mitigation Procedures for Other Wildlife (Includes All Wildlife)

AREVA will implement the following operating procedures to mitigate potential impacts to all wildlife.

- Perform exploration activities (camp layout, drilling) in a manner that limits the size of the Project footprint.
- For longer range flights within the Project area (e.g., between the Kiggavik and Sissons leases), the normal practice is to fly all aircraft at a minimum of 610 m above ground level, except during take off and landing, and when ceiling conditions do not permit.
- For relatively shorter flights (e.g., between camp and ore bodies on Kiggavik lease), normal practice is to fly all aircraft at a minimum of 300 m above ground level, except during take off and landing, and when ceiling conditions do not permit.
- The use of firearms is strictly controlled. The only allowable use of firearms is the use of bear deterrence measures (e.g. shotguns, cracker shells and rubber bullets) as recommended by the GN (GNDOE 2007), and for safety kills to protect human life should a situation arise when other measures have failed.
- Prohibit hunting and trapping by AREVA employees and contractors.

- All wildlife has the “right-of-way”.
- AREVA educates and enforces to site staff “no feeding or harassment of wildlife”, and the appropriate response to animal encounters (especially carnivores and muskoxen). Staff will be required to follow the “Procedures in the “Safety in Bear Country Manual” as recommended by the GN (GNDOE 2007).
- Use of “good house keeping” practices to maintain a garbage-free camp and exploration area, should limit the attraction of animals to the Project. All combustible garbage is burned in an incinerator and ash residue is placed in metal containers and disposed of in Baker Lake (see Waste Management Plan). Non-combustible waste is stored in the camp area and shipped to Baker Lake for disposal.
- If an incident occurs between a grizzly bear, wolverine, wolf, or fox and the exploration program, then the details of the incident will be described in a “Wildlife Incident Form” and AREVA will contact the local wildlife officer with the GN for appropriate protocols and actions. An incident is defined as wildlife-caused damage to camp facilities, continued persistence of a carnivore(s) within the camp or drill rig area, and interactions between humans and wildlife that lead to injury or death.
- All fuel burning equipment meet emission guidelines and are equipped with mufflers.
- All chemicals are stored in double-walled containers or in secondary containment. In addition, diesel fuel, gasoline, and aviation fuel is contained within arctic berms or double-walled storage tanks (see Spill Contingency Plan). In the event of a spill, the Spill Contingency Plan will be implemented immediately, and the spill reported to the appropriate authorities. Used chemicals are stored for transportation off site for proper handling.
- AREVA staff and contractors will record observations of caribou, other wildlife, and carnivore dens and raptor nest sites into a wildlife logbook
- All materials, chemicals, and equipment are removed from the drill sites and camp area at completion of the project as described in the Abandonment and Restoration Plan. The intent is to return the area as close as possible to the natural state.

4 AERIAL GEOPHYSICAL SURVEYS

This section provides a description of the Airborne Gravity Gradiometer (AGG) survey for the Project including flight requirements. This description is followed by a plan for conducting the AGG survey in relation to concerns expressed by the GN on low-level flights and disturbance to caribou.

4.1 Survey Rationale

Airborne techniques are used extensively in mining exploration. Airborne gravity gradiometry surveys are normally conducted once in a cycle of exploration activity. Airborne gravity gradiometry delivers detailed sub-surface density information relating to the underlying geology which can be used as a means of targeting when layered with other geophysical and geological information. However, different methods such as Electromagnetics (EM), Magnetics and Radiometrics may be conducted in other years if required. The proposed survey configuration will combine AGG, Gravity and Magnetic Gradiometry in one survey. Flying altitudes and line spacing's are the main factors that govern the resolution of the survey. To map the targets in the proposed flight plan both a tight line spacing (150 m) and an approximate altitude of 120 m are required.

Airborne gravity gradiometry surveys can gain access to remote areas quickly and reduce exploration time. In addition, where environmental issues may limit the amount of exploration possible with ground activities, airborne surveys, in this case AGG, offers a solution to these issues. If flying over caribou is avoided, then this technique is a non-invasive passive technology, an environmentally friendly alternative that will help to focus future ground-based activities while limiting or reducing impacts to the environment.

4.2 Survey Specifications

The current chosen method is to mount survey instrumentation in a Cessna Grand Caravan aircraft. Instrumentation includes the data acquisition system, which records full tensor gravity gradiometry, gravity, triaxial magnetic gradiometry, digital video, and a complete digital terrain model from an inertially referenced laser (Lidar) altimeter system. The specific requirements to complete this survey are:

- Platform: Cessna C208B Grand Caravan;
- Speed: 220 km/hr (62 m/sec);
- Endurance: 4.5 hrs (with reserve);
- Nominal Flying Height: 120 m;

- Flying Mode: Modified Drape;
- Line Spacing: 150 m;
- Tie Line Spacing: 750 m;
- Ground Cover Restriction: Results are much more precise without snow cover;
- Survey time: 20-50 days (depending on weather conditions and the presence of caribou within the survey area).

As a result of inclement weather the survey proposed to be completed in the 2007 field season was not completed in its entirety, therefore it is AREVA's intention to complete the survey during the 2008 field season.

The following protection measures are suggested for conducting aerial geophysical surveys.

- AREVA will only conduct AGG when caribou will not be disturbed by the survey.
- To meet requirements made by EC and GN, prior to initiating the survey program for the day, a reconnaissance flight is flown at an altitude of 300 meters over the initial line of the proposed route to determine the presence of caribou. If the ceiling is lower than the 300 meters but at an altitude that permits safe flying, the reconnaissance flight will be flown at the maximum altitude possible.
- If a large population of caribou (50 or more individuals in close proximity to one another) are present within the area, then the aircraft will relocate to another part of the block and repeat the reconnaissance flight or will be postponed until the animals are a distance of 2 km from the survey area.
- If no caribou are observed within the survey route, then the survey proceeds at an altitude of 120 m.
- A continuous watch is kept for caribou during the survey.
- If caribou are observed in the study area during the survey, then the survey is aborted.

The proposed window for these surveys is in June, after the northern migration when the cows are on the calving grounds and outside of the study area. The included Figure titled Airborne Survey Boundary and Caribou Sensitive Areas indicates the location of calving grounds in relation to the proposed AGG survey boundaries. The survey could also be completed in mid- to late-August if the cows and calves have moved away from the study area, but weather at that time of year may preclude aerial surveys.

Caribou monitoring data were collected during 2007 and will be included in annual reports submitted to the regulatory agencies. The results of this monitoring will help plan the AGG surveys in 2008.

5 CARIBOU MONITORING AND BASELINE DATA COLLECTION

5.1 Caribou Monitoring Surveys

In Nunavut and the NWT, there is currently limited quantitative data on the distribution, probability of occurrence, or behavioral responses of barren-ground caribou to mineral exploration activities. Although previous government surveys and the movement of satellite-collared animals provide some information for the Beverly and Qamanirjuaq herds, additional data on caribou distribution, group size, and group composition would be helpful for assessing and predicting effects from the Project to caribou.

In 2007, with agreement and permission from the GN and Kivalliq Inuit Association, AREVA implemented caribou monitoring procedures from June to September. Data collected during this period was used to obtain estimates for the following variables:

- group size, number, frequency of occurrence, distribution, and composition of caribou groups (i.e., groups with calves and groups without calves) in the Project area during the post-calving migration period;
- caribou behaviour (e.g., time spent foraging, resting, walking) within the Project area; and
- group size, group composition, number, and distribution of muskoxen in the Project area.

5.1.1 Daily Aerial Surveys

In 2007, daily surveys were conducted in accordance with *Technical Procedure – Daily Aerial Reconnaissance Surveys for Caribou and Muskoxen* to determine the presence of wildlife within 3.5 km of drilling activities on a daily basis during June and July (Section 2.2). As per the request made by the GN, independent wildlife monitors and AREVA personnel conducted daily high-altitude reconnaissance surveys (>300 m) in June and July, if activities were on-going.

In 2008, AREVA is proposing to monitor the location of caribou with the use of satellite collar information in conjunction with daily ground surveillance for caribou cows and calves, and observations during the transport of contractors and site staff. Pilots and passengers will be instructed to watch for wildlife during regular transport. Observations during daily transportation of field staff at altitudes greater than 300 m (see Section 3.1) will provide the same information as the daily reconnaissance surveys conducted in 2007.

If a collared caribou is identified as being on the lease property or within 4 km, verification will occur through an aerial reconnaissance survey (>300 m). Upon verification of a group of caribou (50 or more individuals in close proximity to one another) within 1 km of Project activities, mitigation measures will be implemented (Section 3.1).

5.1.2 Weekly Aerial Surveys

In 2007, weekly aerial surveys were conducted according to *Technical Procedure – Weekly Aerial Surveys for Caribou and Muskoxen* to provide data on the number, group size and composition, and distribution of caribou within the Project area (Section 2.2). This procedure was developed under guidance from a biologist and carried out by site personnel and the independent monitors.

In 2008, weekly aerial surveys to monitor caribou within the mineral leases (Project area) will not be conducted. Instead, aerial surveys for caribou (and muskoxen) will focus on collecting baseline data to fulfill the expected requirements for an environmental Impact assessment (see Section 5.2).

5.1.3 Caribou Behaviour Observations

Scan sampling of caribou groups or individuals (especially cows with calves) from the ground is used to monitor caribou behaviour as a function of distance from exploration activities, including the camp (Curatolo and Murphy 1986). Data collected also will be used as baseline to assess and predict effects from further development of the Project (Section 5.2). This approach provides valuable quantitative data to estimate the zone of influence from project-related activities on caribou behaviour, and better understand the cumulative effects of different types of human developments on caribou populations. The independent wildlife monitor and AREVA staff or contractors will complete a training session provided by a biologist with expertise in scan sampling techniques.

Ground observations focus on determining the proportion of time caribou spend feeding, bedded, standing, alert, walking, trotting, or running. The behaviour of each group or individuals (especially females with calves) is recorded at eight minute intervals for a total duration of no less than 32 minutes and no more than 80 minutes (i.e., four to ten scans per group). The reaction to stressors (e.g., vehicles, aircraft, staff working) by caribou as a function of distance also is recorded during scan sampling. Detailed technical procedures are provided in Appendix II.

5.2 Wildlife Baseline Surveys

Following positive results from the exploration and feasibility programs, AREVA will likely submit an application to develop a uranium mine, and it is anticipated that this will require an Environmental Impact Statement (EIS). To meet regulatory guidelines for the EIS, physical and biological aquatic and terrestrial baseline data will be required. Appendix I explains the rationale and objectives for the selection of wildlife species (i.e., valued components), study area boundaries, and baseline study designs. Details for the study designs and methods are presented in Appendix II.

5.2.1 Caribou Aerial Surveys

Data from satellite and GPS-collared female caribou provides information on the coarse-scale movement and distribution of the Ahiak and Beverly herds during baseline studies. Data from collared animals generally represents the seasonal and annual movement and distribution of the herd, however, sole use of this data is not sufficient for determining environmental design features, or predicting and testing effects from the Project. Collar data does not provide estimates of the number, group composition, and distribution of caribou that may interact with the Project. To achieve quality data for predicting and monitoring the effects of the Project on caribou it is proposed to obtain the combination of course, medium, and fine-scale information from collared animals, aerial transect surveys, and ground observations of behavior (BHPB 2004; Boulanger et al. 2004; Golder 2005; Johnson et al. 2005). Further rationale and objectives for the baseline aerial surveys are provided in Appendix I.

Baseline and monitoring programs at several projects in Nunavut and the NWT have successfully used systematic aerial surveys to obtain robust estimates of group size, group composition, number, and distribution (probability of occurrence) of caribou and muskoxen (Golder 2005; BHPB 2007; DDMI 2007; De Beers 2007; Golder 2007; Miramar 2007). Surveys are flown along pre-determined transects at altitude of 200 m above ground level at speeds of 130 to 160 km/hour during the northern and post-calving migration periods (see Appendix II for details). The approach provides good visibility for detecting caribou groups and determining group composition, which is important for analyzing the effect of development on caribou distribution. Information from satellite-collared animals, commercial pilots, and site staff are used to help determine the timing of surveys.

5.3 Wildlife Log Book

In conjunction with the technical surveys conducted to collect scientific data, AREVA has provided a wildlife log book for all site personnel, contractors, and visitors to complete following the observation of any wildlife. Instructions regarding the log book are provided during orientation and/or arrival on site.

6 REPORTING

All wildlife activities will be reported and updated monthly to ensure quality of the Wildlife Mitigation and Monitoring Plan. Reports will be submitted by supervisors on site to the Project Manager or designate in the Saskatoon office, to regulatory agencies and to the consulting biologist. The monthly reports will be used to help construct a year end overview of the Kiggavik Project.

7 REFERENCES

BHPB (BHPB Diamonds Inc). 2004. Ekati Diamond Mine 2003 Wildlife Effects Monitoring Program. Prepared by Golder Associates Ltd. for BHPB Diamonds Inc.

BHPB. 2007. Ekati Diamond Mine 2006 Wildlife Effects Monitoring Program. Prepared by Rescan™ Environmental Services Ltd. for BHP Billiton Diamonds Inc.

Boulanger, J., K. Poole, B. Fournier, J. Wierzchowski, T. Gaines and A. Gunn. 2004. Assessment of Bathurst Caribou Movements and Distribution in the Slave Geological Province. Department of Resources, Wildlife and Economic Development. Government of the Northwest Territories, Yellowknife, N.W.T. Manuscript Report No. 158.

BQCMB (Beverly and Qamanirjuaq Caribou Management Board). 2006. 24th Annual Report. 2005 – 2006.

BQCMB. 2007. Letter from BQCMB providing comments and recommendations regarding the Kiggavik and Sissons Uranium Exploration Project (March 12, 2007).

Curatolo, J.A., and S.M. Murphy. 1986. The effects of pipelines, roads, and traffic on the movement of caribou, *Rangifer tarandus*. Canadian Field-Naturalist, 100:218-224.

DDMI (Diavik Diamond Mines Inc.). 2007. 2006 Wildlife Monitoring Report. Prepared by Diavik Diamond Mines Inc.

De Beers. 2007. Snap Lake Project Wildlife Effects Monitoring Program. 2006 Annual Report. Prepared for De Beers Canada Inc. by Golder Associates Ltd., Yellowknife, N.W.T. September 2007.

Durey, O. 2007. Letter from Orin Durey providing comments and recommendations regarding the Kiggavik and Sissons Uranium Exploration Project (March 12, 2007).

EC (Environment Canada). 2007. Letter from EC providing comments and recommendations to AREVA Resources Canada Inc. for Kiggavik and Sissons Uranium Exploration Project (March 12, 2007).

GNDOE (Government of Nunavut, Department of Environment). 2007. Letter from GNDOE providing comments and recommendations to AREVA Resources Canada Inc. for Kiggavik and Sissons Uranium Exploration Project (March 7, 2007).

Golder (Golder Associates Ltd.). 2005. Analysis of environmental effects from the Diavik Diamond Mine on wildlife in the Lac de Gras region. Submitted to Diavik Diamond Mines Inc.

Golder. 2007. Jericho Diamond Project: 2006 Wildlife Monitoring Program Data Summary. Submitted to Tahera Diamond Corporation, Jericho Project, Box 2341, Yellowknife, NT. March 2007.

Johnson, C.J., M.S. Boyce, R.L. Case, H.D. Cluff, R.J. Gau, A. Gunn and R. Mulders. 2005. Cumulative Effects of Human Developments on Arctic Wildlife. Wildlife Monographs, 160: 1-37.

Miramar (Miramar Hope Bay Ltd.). 2007. Doris North Gold Mine Project. Wildlife Mitigation and Monitoring Program. 2007 Annual Report. Prepared by Golder Associates Ltd. for Miramar Hope Bay Ltd.

APPENDICIES

APPENDIX I

RATIONALE AND OBJECTIVES FOR BASELINE STUDY DESIGNS AND SAMPLING PROTOCOLS

1.0 Rationale and Objectives for Baseline Study Designs and Sampling Protocols

1.1 General Rationale and Objectives

Following positive results from the exploration program and feasibility studies, AREVA Resources Canada Inc. (AREVA) will likely submit an application for the development of a uranium mine, which will probably require an Environmental Impact Statement (EIS). To meet the anticipated Nunavut Impact Review Board guidelines for the EIS for the project, AREVA began collecting aquatic and terrestrial baseline data in 2007. In general, the principal objectives of baseline studies are:

- to collect information on the current physical conditions (*e.g.*, water quality, hydrology, soils), species, and habitats in the study area, including the identification of listed and uncommon species, and critical aquatic and terrestrial habitats (*i.e.*, sensitive ecological attributes);
- to obtain estimates of natural variation in biophysical variables such as water quality and quantity, and species presence, richness, abundance, and distribution;
- to implement environmental design features and management plans (mitigation measures) during the design of the project to avoid or limit disturbance to biophysical variables and habitats, particularly sensitive ecological attributes;
- to help predict effects from the project on current ecological conditions, species, and habitats; and,
- to provide data for comparison to environmental effects monitoring programs during construction and operation to test impact predictions (*i.e.*, before-after-control-impact studies), and the effectiveness of environmental design features and management plans.

The following sections provide the rationale and objectives for the study designs and methods that are specific to collecting baseline data on wildlife and habitat for the Kiggavik Project (see Appendix II for detailed study designs and methods). Species selected were based on recent and current environmental assessments (EAs) and monitoring programs in Nunavut and the Northwest Territories (NWT). Similarly, study designs and sampling protocols follow the current methods accepted for monitoring effects on wildlife and habitat at mine sites in Nunavut and the NWT. By consistently using standardized and up-to-date methods, direct comparisons can be made among projects that differ in the spatial extent of the footprint and level of mining activity. Such a meta-analysis can be used to help understand and manage the cumulative effects from development on wildlife populations and habitat. The data can be used also to participate in regional and/or collaborative programs such as the Cumulative Impact Management Framework, which is a current objective of the Nunavut Planning Commission.

1.2 Selection of Wildlife Valued Components

Valued components (VCs) represent physical, biological, cultural, and economic properties of the social-ecological system that are considered to be important by society. In general, the selection of wildlife VCs (or valued ecosystem components [VECs]) for EAs and effects monitoring programs in Nunavut and the NWT has been quite consistent. For example, caribou, grizzly bears, wolverine, wolves, foxes, upland breeding birds, waterfowl, raptors, and wildlife habitat were chosen as VCs for EAs for the Ekati, Diavik, Snap Lake, and Gahcho Kué projects in the NWT (BHP 1995; DDMI 1998; De Beers 2002; MVEIRB 2007), and for the Jericho and Doris North projects in Nunavut (Tahera 2000; Miramar 2005). Muskoxen were also selected as a study species for the Jericho and Doris North projects, and muskoxen and moose were included for the Gahcho Kué project. Species selected for monitoring the effects from these projects during construction and operation include caribou, muskoxen, grizzly bears, wolverines, wolves, upland breeding birds, waterfowl, and raptors (Tahera 2005; Miramar 2006; BHPB 2007; DDMI 2007; De Beers 2007).

Based on this review, the following wildlife VCs were selected to focus baseline studies for the Kiggavik Project:

- habitat;
- caribou;
- muskoxen;
- grizzly bear;
- wolverine;
- wolf and foxes;
- upland breeding birds (songbirds, shorebirds, ptarmigan);
- water birds (ducks, geese, swans, loons); and,
- raptors (falcons, hawks, eagles, ravens, owls).

Information on the presence and location of other wildlife species also will be collected during the baseline program.

1.3 Selection of the Study Area

The study area is centered on the anticipated location of the Kiggavik Project, and is adjacent to the southern extent of the calving grounds for the Beverly caribou herd. The study area is 90 km long and 80 km wide (7,200 km^2), and includes all of Judge Sissons Lake, and parts of Aberdeen, Schultz, Mallory, and Princess Mary lakes (Figure 1). The spatial extent of the study area was based on the following rationale:

- current study areas for caribou and other large mammals (muskoxen, grizzly bears, wolves) for mining projects in Nunavut and the NWT (*e.g.*, Diavik and Ekati combined = 6,000 km^2; Snap Lake = 3,100 km^2; Gahcho Kué = 5,600 km^2; Doris North = 4,300 km^2);
- logistical constraints related to survey coverage of the study area, pilot, and observer fatigue;
- anticipated mine plan for the Kiggavik Project (four open pits, processing plant, tailings management facility) and current estimates for the zone of influence from major developments on caribou (13 km to 33 km [Boulanger *et al*. 2004; Golder 2005; Johnson *et al*. 2005]). The study area must be large enough to capture the zone of influence and provide data for caribou behaviour and probability of occurrence outside the zone of influence (*i.e.*, control data); and,
- avoidance of the calving grounds for the Beverly caribou herd, known location of caribou water crossings along the Thelon River basin (*i.e.*, Aberdeen and Schultz lakes), and the associated predicted importance of the study area for caribou during the northern (mid-April to late May) and post-calving (July to October) migration periods.

1.4 Objectives and Rationale for Wildlife Baseline Study Designs

1.4.1 Caribou and Muskoxen

Objectives

Data collected during baseline studies will be used to provide estimates of the natural variation for the following variables:

- group size, number, density, and distribution of caribou within the study area during the northern and post-calving migration periods;
- composition of caribou groups (*i.e.*, groups with calves and groups without calves) within the study area during the post-calving migration;
- caribou behaviour (*e.g.*, time spent foraging, resting, walking) within the study area; and,
- group size, group composition, number, density, and distribution of muskoxen in the study area.

Rationale

Baseline and monitoring programs at several projects in Nunavut and the NWT have successfully used systematic aerial surveys to obtain robust estimates of group size, group composition, number, and distribution (probability of occurrence) of caribou and muskoxen (Golder 2005; BHPB 2007; DDMI 2007; De Beers 2007; Miramar 2007). Surveys are flown along pre-determined transects at altitude of 200 m above ground level at speeds of 130 to 160 km/hour during the northern and post-calving migration periods (see Appendix II for details). The approach provides good visibility for detecting caribou groups and determining group

composition, which is important for analyzing the effect of development on caribou distribution. Information from satellite-collared animals, commercial pilots, and site staff are used to help determine the timing of surveys.

Aerial survey data have provided much needed information on the temporal and spatial responses of caribou to mine development. For example, comprehensive statistical analyses at the Ekati and Diavik mines showed that in some years, the likelihood of observing caribou feeding/resting increased with distance from the mine, in other years, the trend was reversed or not significant, and was dependent on migration period (BHPB 2004; Golder 2005). As expected, the proportion of groups feeding/resting was lowest during construction of the Diavik mine (development phase with greatest activity and staff loads). At both mine sites, the likelihood of observing groups with calves decreased with an increase in distance from the project. Temporal changes in observing groups with calves in the study areas appears to be more related to calf recruitment in the population than the local influence of the mine footprint. Annual variation in group composition in the Diavik and Ekati study area was similar to data from the Snap Lake study area, and the lowest proportion of nursery groups observed corresponded with low calf recruitment rates determined from government surveys (De Beers 2005).

Additional analyses using aerial survey data predicted that the zone of influence on caribou habitat selection increased during operation of the Ekati mine, and ranged from 17 km to 32 km in 2002 (Boulanger *et al*. 2004). Analysis of resource selection models for the Diavik mine indicated no temporal change in the probability of caribou occurrence in the study area, and the average annual zone of influence around the mine ranged from 22 km to 26 km (Golder 2005). Analysis of aerial survey data also have been instrumental for determining the relative preference and avoidance of habitats by caribou, which is critical for developing empirical and site-specific habitat suitability models (BHPB 2004; Boulanger *et al*. 2004; Golder 2005).

Scanning observations of ungulates from the ground is an established and accepted method for estimating the time individuals spend among various activities (*e.g.*, feeding, resting, walking [Curatolo and Murphy 1986]). Analyses of these data have provided valuable information on the smaller scale responses of caribou to mine development. For example, data on ground observations of behaviour suggested that caribou groups with calves spend about 10% to 15% less time feeding within 5 km of the Ekati mine (BHPB 2003, 2004). Feeding behaviour of groups without calves was independent of distance from the mine. Similarly, instantaneous reactions to different stressors (*e.g.*, aircraft, blast, heavy and light trucks) were stronger for groups with calves than groups without calves (BHPB 2007).

Data from satellite and GPS-collared female caribou will provide information on the coarse-scale movement and distribution of the Ahiak and Beverly herds during baseline studies. Although the data from collared animals generally represents the seasonal and annual movement and distribution of the herd, sole use of this data is not sufficient for determining environmental

design features, or predicting and testing effects from the project. Collar data do not provide estimates of the number, group composition, and distribution of caribou that may interact with the project. However, the combination of course, medium, and fine-scale information from collared animals, aerial transect surveys, and ground observations of behaviour, respectively, will likely provide quality data for predicting and monitoring the effects of the project on caribou (BHPB 2004; Boulanger *et al*. 2004; Golder 2005; Johnson *et al*. 2005).

1.4.2 Grizzly Bears

Objectives

Data collected during baseline studies will be used:

- to determine the natural variation in the relative activity level and distribution of grizzly bears within the study area; and,
- to determine the presence and distribution of grizzly bear dens in the study area.

Rationale

Studies of barren-ground grizzly bears in the central Arctic have shown that newly emergent sedges comprised a large amount of the diet during early summer (Gau *et al*. 2002), and that bears preferentially select tussock-hummock habitats during the spring through late summer, and riparian habitats during the late summer and autumn (McLoughlin *et al*. 2002). Based on this research, the presence of bear sign within and adjacent to seasonal high quality (*i.e.*, preferred) habitats has been used as an index of relative activity by grizzly bears within the study area (Golder 2005; BHPB 2007; DDMI 2007; De Beers 2007; Golder 2007a; Miramar 2007). Wetland habitats will be sampled during green-up in early summer and riparian and tussock-hummock habitats will be sampled in late summer (see Appendix II for details). These surveys, along with surveys of eskers for wolf and fox dens, will be used to locate the presence of active and inactive grizzly bear dens.

At the Ekati, Diavik, and Snap Lake projects, analysis of these data have detected significant annual variation in the relative activity of grizzly bears within the study area (BHPB 2004; Golder 2005; BHPB 2007; De Beers 2007). Analysis also indicated that the probability of occurrence of grizzly bear sign was higher for plots closer to the Ekati and Diavik mines (Golder 2005; BHPB 2007). These results indicate that the study design and method are capable of measuring changes in the relative activity level and distribution of grizzly bears within the study area.

1.4.3 Wolverines

Objective

Data collected during baseline studies will be used to determine the natural variation in the relative activity level and distribution of wolverine in the study area.

Rationale

The relative activity and distribution of wolverine in the study area will be measured through surveys for wolverine tracks along equal-length transects located in preferred wolverine habitat (see Appendix II for details). The method is currently being used at the Diavik, Snap Lake, Jericho, and Doris North projects, and was used at the Ekati mine (BHPB 2004; DDMI 2007; De Beers 2007; Golder 2007a; Miramar 2007). Analyses from longer-term data sets have measured significant annual changes in the relative activity of wolverine in the study area (De Beers 2007; Golder 2007b). In addition, the likelihood of observing a wolverine track was statistically greater for transects closer to the mine than further from the mine (Golder 2007b). These results indicate that the study design and method are capable of measuring changes in the relative activity level and distribution of wolverine within the study area.

It is important to acknowledge that the snow track method is not designed to estimate the annual changes in abundance of wolverines in the study area. Currently, the government of the NWT (Environment and Natural Resources) has developed and implemented a successful program for estimating the abundance, density, and demographic parameters of wolverine at several mining projects in the NWT (Boulanger and Mulders 2007; Mulders *et al*. 2007). The study design uses baited posts, arranged in a sampling grid, to capture wolverine hair, which are then analyzed using DNA finger printing techniques. The method also has been incorporated into the wildlife mitigation and monitoring programs for the Jericho and Doris North projects in Nunavut, and will be considered as part of the baseline studies for the Kiggavik Project.

1.4.4 Wolves and Foxes

Objectives

Data collected during baseline studies will be used to determine:

- the natural variation in the distribution, occupancy, and productivity of wolf dens in the study area; and,
- the distribution and activity of fox dens in the study area.

Rationale

Aerial and ground surveys of eskers for wolf and fox dens are standard and accepted methods used in baseline and monitoring programs (BHP 1995; DDMI 1998; De Beers 2002; Miramar 2005; BHPB 2007; De Beers 2007 [see Appendix II for details]). Some studies also have collected data on the annual occupancy and pup production of wolf dens in the study area (De Beers 2005, 2007; BHPB 2007).

1.4.5 Upland Breeding Birds

Objective

Data collected during baseline studies will be used to determine the natural variation in bird density (species and community), and species richness.

Rationale

Upland breeding birds have been surveyed using two approaches. One approach used a method that searched the entire area of plots ranging in size from 1 ha to 25 ha (De Beers 2002; BHPB 2007). Smith *et al*. (2005) assessed mine-related impacts on species and community-level metrics (density, diversity, richness) for tundra-breeding birds using 25 ha plots that ranged from 200 m to 800 m (mean = 400 m) from the Ekati footprint (mine plots), and 3 km to 24 km (mean = 10 km) from the footprint (control plots). Although the study detected limited effects on tundra-breeding birds, it was suggested that the zone of influence may be less than 400 m.

As a result of the analysis by Smith *et al*. (2005), a second approach was designed to obtain baseline estimates for species richness and density, and establish a program for future before-after-control-impact studies (Golder 2007a; Miramar 2007). The method uses standard point count stations with a 50 m radius, and the data also can be provided to the North American Breeding Bird Survey (see Appendix II for details). Point count stations (survey plots) are established within and adjacent to the anticipated project footprint (along a gradient of distance from the project), and at locations greater than 10 km from the expected footprint (control plots). Point count surveys are combined with surveys developed by the Canadian Wildlife Service (Program for Regional and International Shorebird Monitoring) to provide regional data on shorebirds in the Arctic.

1.4.6 Water Birds

Objective

Data collected during baseline studies will be used to determine the natural variation in species density and richness in the study area during the northern migration/establishment of nesting territories, brood rearing period, and southern migration.

Rationale

Aerial surveys for waterfowl will be conducted using standard survey block procedures, which is the suggested and accepted method by biologists at the Canadian Wildlife Service (Golder 2007a; Miramar 2007). Survey blocks will include lakes and wetlands in anticipated impact areas, and control areas (see Appendix II for details). Transects within survey blocks will be flown by helicopter at an altitude of 45 m above ground level, and a speed of 80 to 100 km/hour (Hines *et al*. 2000, 2003; Larned *et al*. 2003).

1.4.7 Raptors

Objective

Data collected during baseline studies will be used to determine the natural variation in nest site distribution, occupancy, success, and productivity of raptors in the study area.

Rationale

The initial identification of raptor nest sites typically occurs during aerial and ground surveys for other species (*e.g.*, caribou, grizzly bear sign, water birds). Aerial surveys of identified raptor nests for spring occupancy and summer nest success and chick production are standard and accepted methods used in baseline and monitoring programs (DDMI 1998; De Beers 2002; Miramar 2005; BHPB 2007; DDMI 2007; De Beers 2007; Miramar 2007 [see Appendix II for details]). Analyses have detected significant annual variation in nest success and chick production (Golder 2005; BHPB 2007). The data provide robust estimates of the demographic performance of raptor populations among different regions of Nunavut and the NWT, which can be used to make inferences about local and regional-scale effects on these biological indicator species of environmental change.

References

BHP. 1995. NWT Diamonds Project, Environmental Impact Statement. Prepared for BHP Diamonds Inc. by Rescan Environmental Services Ltd.

BHPB (BHPB Diamonds Inc). 2003. Ekati Diamond Mine 2002 Wildlife Effects Monitoring Program. Prepared by Golder Associates Ltd. for BHPB Diamonds Inc.

BHPB (BHPB Diamonds Inc). 2004. Ekati Diamond Mine 2003 Wildlife Effects Monitoring Program. Prepared by Golder Associates Ltd. for BHPB Diamonds Inc.

BHPB (BHPB Diamonds Inc). 2007. Ekati Diamond Mine 2006 Wildlife Effects Monitoring Program. Prepared for BHPB Diamonds Inc. by Rescan Environmental Services Ltd.

Boulanger, J., K. Poole, B. Fournier, J. Wierzchowski, T. Gaines, and A. Gunn. 2004. Assessment of Bathurst caribou movements and distribution in the Slave Geological Province. Manuscript Report No. 158.

Boulanger, J. and R. Mulders. 2007. Analysis of 2005 and 2006 wolverine DNA mark-recapture sampling at Daring Lake, Ekati, Diavik, and Kennady Lake, Northwest Territories. Draft Report prepared for Environment and Natural Resources, Government of the Northwest Territories by Integrated Ecological Research.

Curatolo, J.A. and S.M. Murphy. 1986. The effects of pipelines, roads, and traffic on the movement of caribou, Rangifer tarandus. Canadian Field-Naturalist, 100:218-224.

DDMI (Diavik Diamond Mines Inc.). 1998. Environmental Effects Report, Wildlife. Prepared by Diavik Diamond Mines Inc., Yellowknife, Northwest Territories.

DDMI (Diavik Diamond Mines Inc.). 2007. 2006 Wildlife Monitoring Report. Prepared by Diavik Diamond Mines Inc., Yellowknife, Northwest Territories.

De Beers. 2002. Environmental Assessment Report for the Snap Lake Diamond Project. Prepared by Golder Associates Ltd. for De Beers Canada Mining Inc.

De Beers. 2005. Snap Lake Project. Wildlife Baseline Studies for the Snap Lake Project, 1999 to 2004. Prepared by Golder Associates Ltd. for De Beers Canada Inc.

De Beers. 2007. Snap Lake Project. Wildlife Effects Monitoring Program. 2006 Annual Report. Prepared by Golder Associates Ltd. for De Beers Canada Inc.

Gau, R., R. Case, D.F. Penner, and P.D. McLoughlin. 2002. Feeding Patterns of Barren-ground Grizzly Bears in the Central Canadian Arctic. Arctic 55:339-344.

Golder (Golder Associates Ltd.). 2005. Analysis of environmental effects from the Diavik Diamond Mine on wildlife in the Lac de Gras region. Submitted to Diavik Diamond Mines Inc.

Golder (Golder Associates Ltd.). 2007a. Jericho Diamond Project: 2006 Wildlife Monitoring Program Data Summary. Submitted to Tahera Diamond Corporation, Jericho Project, Box 2341, Yellowknife, NT. March 2007.

Golder (Golder Associates Ltd.). 2007b. A comparison of methods for monitoring abundance and distribution of wolverine at the Diavik Diamond Mine. Prepared for Diavik Diamond Mines Inc. by Golder Associates Ltd.

Hines, J.E., D.L. Dickson, B.C. Turner, M.O. Wiebe, S.J. Barry, T.A. Barry, R.H. Kerbes, D.J. Nieman, M.F. Kay, M.A. Fournier, and R.C. Cotter. 2000. Population Status, Distribution, and Survival of Shortgrass Prairie Canada Geese from the Inuvialuit Settlement Region, Western Canadian Arctic. Towards Conservation of the Diversity of Canada Geese (Branta canadensis). K.M. Dickson (ed.), Occasional Paper No. 103: 27-58. Canadian Wildlife Services, Environment Canada, Ottawa, Ontario.

Hines, J.E., M.F. Kay, and M.O. Wiebe. 2003. Aerial Surveys of Greater White-fronted Geese (*Anser albifrons frontalis*) and other Waterfowl in the Rasmussen Lowlands of the Central Canadian Arctic. Wildfowl 54:183-199.

Johnson, C.J., M.S. Boyce, R.L. Case, H.D. Cluff, R.J. Gau, A. Gunn, and R. Mulders. 2005. Cumulative effects of human developments on arctic wildlife. Wildlife Monographs 160:1-36.

Larned, W., R. Stehn, and R. Platte. 2003. Eider Breeding Population Survey Arctic Coastal Plain, Alaska. United States Fish and Wildlife Service.

McLoughlin, P.D., R.L. Case, R.J. Gau, H.D. Cluff, R. Mulders, and F. Messier. 2002. Hierarchical Habitat Selection by Barren-ground Grizzly Bears in the Central Canadian Arctic. Oecologia 132:102-108.

Miramar (Miramar Hope Bay Ltd.). 2005. Final Environmental Impact Statement, Doris North Project, Nunavut, Canada. Miramar Hope Bay Ltd.

Miramar (Miramar Hope Bay Ltd.). 2006. Proposed Wildlife Mitigation and Monitoring Program for the Doris North Gold Mine Project. Prepared by Golder Associates Ltd. for Miramar Hope Bay Ltd.

Miramar (Miramar Hope Bay Ltd.). 2007. Doris North Gold Mine Project. Wildlife Mitigation and Monitoring Program. 2007 Annual Report. Prepared by Golder Associates Ltd. for Miramar Hope Bay Ltd.

Mulders, R., J. Boulanger, and D. Paetkau. 2007. Estimation of population size for wolverines (*Gulo gulo*) at Daring Lake, Northwest Territories, using DNA-based mark-recapture methods. Wildlife Biology 13: (in press).

MVEIRB (Mackenzie Valley Environmental Impact Review Board). 2007. Terms of Reference for the Gahcho Kué Environmental Impact Statement.

Smith, A.C., J.A. Virgl, D. Panayi, and A.R. Armstrong. 2005. Effects of a Diamond Mine on Tundra-breeding Birds. Arctic, 58:295-304.

Tahera (Tahera Diamond Corporation). 2000. Jericho Project Environmental Impact Assessment. North Vancouver, B.C.

Tahera (Tahera Diamond Corporation). 2005. Proposed Wildlife Mitigation and Monitoring Plan for the Jerecho Diamond Project. Prepared by Golder Associates Ltd. for Tahera Diamond Corporation.

APPENDIX II

TECHNICAL PROCEDURES FOR THE KIGGAVIK WILDLIFE BASELINE STUDIES

TECHNICAL PROCEDURES – AERIAL SURVEYS FOR CARIBOU AND MUSKOX

PURPOSE

The purpose of aerial surveys for caribou and muskox is to:

- estimate the number of caribou and muskox within the study area;
- determine the distribution of caribou and muskox within the study area;
- determine the composition of caribou and muskox groups within the study area;
- record point observations of caribou and muskox behaviour during aerial surveys;
- determine the density and distribution of caribou snow tracks in the study area; and,
- record incidental observations of all wildlife.

APPLICABILITY

Northern (mid-April to late May) and post-calving (July to October) migration periods.

FIELD PROCEDURES

The surveys will be conducted on 11 transect lines flown in a north-south direction following a predetermined flight path using GPS co-ordinates (Figure 1). Transect 1 and 2, and 10 and 11 are spaced 8 km apart, while the remaining transects are separated by a distance of 6 km. The study design intends to provide good coverage of the main project area while maintaining data quality by limiting observer fatigue. An important aspect of the study design and study area is to capture the natural variation in movement and abundance (frequency of use) of caribou along the Thelon River basin (i.e., crossings at Aberdeen and Schultz lakes) as they enter the anticipated project area during the post-calving migration. Presence of caribou in the study area will be determined from satellite collar information, communication with commercial pilots flying in the area, and information from site personnel and contractors. Approximately six to eight surveys will be completed each year from mid-April through September, depending on the presence of caribou in the region. If more than 1,000 caribou are present in the study area, then surveys should be conducted every four to five days. This information will be critical for predicting effects from the proposed project.

Techniques

A helicopter will be used for all aerial surveys. In addition to the pilot, a navigator in the front seat will use a 1:250,000 scale map to follow a pre-determined flight path (transect coordinates should also be downloaded in the aircraft GPS unit). The navigator will

record all observations of wildlife way point number in the GPS and on the data sheets. The navigator will also record species, number of animals in group (group size), group composition, dominant behaviour of the group, and habitat type on the data sheet provided (note that the way point [GPS location], group size and group composition are the critical attributes to record). During snow/ice cover conditions, habitat types should be classified as hilltop, valley, lake shore, or ice (*i.e.*, frozen lake). Two observers situated in the rear seat on either side of the aircraft will communicate observations to the navigator/data recorder. Surveys will be conducted at 200 m above ground level (agl), at a speed of 130 to160 km/hour. All caribou and muskoxen within 600 m of either side of the helicopter will be counted, amounting to approximately 15% coverage of the study area. The location and direction of historic caribou trails (areas where the frequent migrations of caribou have left "scars" on the land) also will be recorded.

Estimates of the number of caribou snow tracks (not for muskox) will also be recorded during the northern migration and late post-calving migration (when there is greater than 50% snow cover). Information will be recorded on a separate data sheet by one of the observers. At two minute intervals (approximately 4 km to 5 km), each observer will estimate the number of trails observed during the previous two minutes as none (no tracks observed), low (occasional single tracks), moderate (regular single tracks or occasional trails), or high (continuous single tracks or large numbers of trails).

The following information will be recorded for caribou and muskox group observations:

- GPS location (way point), using hand held GPS or helicopter GPS;
- habitat type;
- number of animals in group;
- dominant composition of the group;
- number of calves and cows in group (when applicable); and
- dominant behaviour of group.

Incidental observations of other species will be made, but there will be no excessive deviation from the flight path in connection with such observations. Incidental observations of grizzly bears (and bear dens), wolves (and wolf dens), wolverines, raptors or raptor nest sites will be recorded on aerial survey data sheets. These observations will later be recorded in the "incidental observation" database and not in the caribou and muskox aerial survey database.

If surveys detected no caribou or muskox, then a "0" should be entered on the data sheet and in the database for that date.

EQUIPMENT AND MATERIALS

- Binoculars;
- GPS units;
- Maps; and,
- Data sheets and classification codes for group composition and behaviour, and habitat.

CLASSIFICATION SYSTEM FOR CARIBOU AND MUSKOX GROUP COMPOSITION, BEHAVIOUR AND HABITATS

Caribou and Muskox Group Composition

Caribou and muskox will be classified to one of the following group types, based on the presence of calves in a group.

- Nursery (Nurse)– any group with calves (including solitary calves); and,
- Non-nursery (Nonnurse) – groups with no calves.

Caribou and Muskox Behaviour Categories

- Bed (B);
- Stand (S);
- Feed (F);
- Alert (A);
- Walk (W);
- Trot (T); and,
- Run (R).

Habitat Categories Based on ELC Classification.

- HT = heath tundra;
- HT-b = Heath tundra with 30-80% boulder;
- LV = lichen veneer (dry sedge – lichen). May be difficult to observe;
- SW = sedge wetland (wet meadow or emergent marsh);
- TH = tussock-hummock;
- RS = riparian shrub / birch seep (riparian willow);
- BE = greater than 80% bedrock (bedrock association);
- WAT = lake with open water (Lake);
- ICE = frozen lake (Lake – shallow or deep water); and,
- DS = disturbed by infrastructure.

TECHNICAL PROCEDURES – CARIBOU ACTIVITY BUDGETS

PURPOSE

To determine the variation in caribou behaviour within the study area.

APPLICABILITY

Applicable for all caribou in the vicinity of the project, and for caribou greater than 10 km from the project activities (controls).

FIELD PROCEDURES

Scan Sampling of Caribou Groups

Scan sampling of caribou groups or individuals from the ground will be used to monitor caribou behaviour as function of distance from the project. The method to be used is adapted from Curatolo and Murphy (1986), and will involve two observers. Observers should position themselves so that they do not influence caribou behaviour.

Individual caribou activities will be recorded as feeding, bedded, standing, alert, walking, trotting, or running. Individuals (not the dominant behaviour of the group) will be classified as feeding when they are actually foraging or searching for food (*i.e.*, walking with head down).

The GPS location will be recorded, and observations will be conducted when caribou are present in the study area. Group composition will be classified, and the estimated number of animals in the group will be recorded. Also record the habitat type, and number of calves and cows in a group (if applicable).

The group will be scanned every 8 minutes for a minimum period of 32 minutes and a maximum of 80 minutes (*i.e.*, four to ten observations per group). For each scan, the number of animals exhibiting a specific behaviour will be recorded (up to 30 to 40 animals can be scanned accurately). If the group is too large (*i.e.*, greater than 40 animals), then focus on a smaller portion of the group. The group size does not have to be the same for each 8 minute scan. A strong attempt should be made to distribute the number of observations evenly over distances of less than 2 km from the project to distances up to 30 km from the project.

Response to Specific Stressors

For all caribou groups, instantaneous observations will be used to assess the response of caribou to different potential stressors as a function of distance. These observations will occur during scan sampling, and consequently, no increase in observation time will be required. In the event that a stressor is introduced during scan sampling, the observers will note the time (in the comments box) and record the response of caribou to the stressor as "no reaction" or "exhibiting a reaction" (*i.e.*, alert posture, walking or running away from disturbance; see data sheet). The reaction of the majority of the group will be used in selecting the category. Estimated distance (meters) from the stressor will also be recorded. Stressors may include type of aircraft, project staff and insects (bot/warble flies, mosquitoes).

The observers will then wait until the animals resume previous behaviour (1 to 2 minutes), and begin scanning observations again.

EQUIPMENT AND MATERIALS

- Binoculars, spotting scope, tripod;
- Watches or stopwatches;
- GPS units; and,
- Data sheets and classification codes for group composition and habitat.

TECHNICAL PROCEDURES – EARLY SUMMER / LATE SUMMER HABITAT SURVEYS FOR GRIZZLY BEAR ACTIVITY

PURPOSE

To determine the natural variation in the relative activity level and distribution of grizzly bears within the study area.

APPLICABILITY

Preferred bear habitat during early summer (June) and late summer (August).

FIELD PROCEDURES

The presence of bear sign within and adjacent to seasonal high quality (i.e., preferred) habitats will be used as an index of habitat utilization by grizzly bears within the study area. The location of sample plots will be based on habitat in the study area and includes wetland and tussock-hummock habitats during green-up in early summer (June) and riparian shrub and tussock-hummock habitats in the late summer (August). It is important to conduct the spring surveys when newly growing shoots of sedges and grasses appear (*i.e.*, the time of the survey depends on the time of new plant growth and not on a specific date each year). At least 40 plots will be surveyed in early summer, and at least 40 plots will be surveyed in late summer. Sample plots will be uniquely identified, located on a map, and GPS coordinates will be recorded. This will insure that the same plots can be sampled during subsequent years.

Each plot will encompass of a 500 m x 500 m area and comprise a minimum of 20% of the preferred habitat types. Observers will initiate the search for bear sign from the center (provided by pre-determined UTM coordinates) of each plot. If the center point falls within open water, then begin searching from the nearest shoreline. Thus, the plot represents the initial point of the survey, but searching should not be restricted to the area of the plot and should include an approximate 1 km buffer from the initial starting point. The idea is to obtain coarse-scaled information on the presence/absence of grizzly bear activity within and adjacent to each plot. For example, if an esker or sandy outcrop is located within 1 km of the plot, observers should include the site in their search area. The duration of each search within and adjacent to the plot will be standardized to one hour.

Sign includes attributes such as dens, digs (for ground squirrels), tracks, scat, hair and prey remains. If sign is detected, the number of independent sign is to be recorded. The age of sign will also be recorded (*i.e.,* made this year [since emergence from dens] or

previous years). A narrative description of the type of sign will be recorded on the data sheet. If no sign is detected, then record as such on the data sheet and in the database.

One data sheet will be used for each sample plot.

The field crew will consist of two observers with land-based and sign recognition experience, and an additional person will serve as a "look-out" and must remain vigilant towards potential bear encounters at all times (see Bear Safety Procedures).

BEAR SAFETY PROCEDURES

Safety is first. Before surveying a polygon, especially riparian shrub habitat, fly over the area closely to check for bears in the area. If a bear is within 5 km of the plot or a fresh kill is observed in the area, move on to survey another site, and return to the previous site at a later time (*i.e.*, do not entirely abandon the plot).

EQUIPMENT AND MATERIALS

- Maps and UTM coordinates with identified sample plot locations during spring and summer;
- Data sheets and classification for habitats;
- GPS units; and,
- Bear spray, bangers and flares.

TECHNICAL PROCEDURES – WOLVERINE SNOW TRACK SURVEYS

PURPOSE

To determine the natural variation in the relative activity level and distribution of wolverine in the study area.

APPLICABILITY

Mid to late winter.

FIELD PROCEDURES

Surveys for wolverine tracks will be conducted along a number of transects (40 to 50), with a length of 4 km, distributed throughout the study area. Transects will be established by randomly selecting 4 km^2 plots within the study area that contain preferential habitat for wolverine (*i.e.*, heath tundra – boulder associations and shoreline habitat). The habitat associations were identified through discussions with aboriginal hunters from Kugluktuk who contributed important traditional knowledge of wolverine behaviour on the tundra. Transects will be uniquely identified, and located on a map with associated GPS coordinates.

Transects will be traveled by two observers on snowmobiles, driving slowly (less than 15 km/h) and spaced approximately 25 m apart on either side of the transect. A GPS location for all wolverine tracks will be recorded as well as information on the direction of travel and the age of the track. An attempt will be made to identify individual tracks if more than one track is observed on a transect. Track counts will be standardized to account for the effects of the number of days since snowfall and wind speed. Surveys should occur in December/January and March/April.

For each wolverine track observation, record:

- observation number;
- number of wolverines (sex, if possible);
- direction of travel; and,
- UTM coordinates.

EQUIPMENT AND MATERIALS

- Binoculars;
- GPS units;
- Data sheets; and,
- Map showing transects and associated UTM coordinates.

TECHNICAL PROCEDURES – ESKER SURVEYS FOR CARNIVORE DENS

PURPOSE

Data collected during baseline studies will be used to determine:

- the natural variation in the distribution, occupancy, and productivity of wolf dens in the study area; and,
- the distribution and activity of fox and grizzly bear dens in the study area.

APPLICABILITY

Spring through summer.

FIELD PROCEDURES

All major eskers in the study area will be surveyed for dens of grizzly bear, wolf, and fox (and ground squirrel burrows). A combination of aerial and ground-based techniques will be used for the surveys. In mid-late May, a helicopter will be flown along each side of the esker at 50 m agl, and approximately 80 km/hour. Following the aerial survey, three people will walk the length of each esker, one on each side and one on top. Ground-based surveys will verify the type (bear, wolf, fox) and age (recent or historic) of dens recorded during aerial surveys, and locate missed den sites. Dens recorded as occupied during the aerial survey will be avoided during the ground-based survey. Occupied wolf dens will be re-surveyed in July and August to record pup production. Dens will be initially assessed from the air by helicopter. If there is sign of activity (e.g., wolves present, tracks, prey remains), then the den will be observed from the ground at a distance of approximately 500 m (using a spotting scope and binoculars) until field staff are confident that a full pup count has been obtained. A strong effort will be made to limit disturbance to the animals.

EQUIPMENT AND MATERIALS

- Binoculars, spotting scope, tripod;
- GPS units; and,
- Data sheets.

TECHNICAL PROCEDURES – UPLAND BREEDING BIRD SURVEYS

PURPOSE

To determine the natural variation in bird density (species and community), and species richness.

APPLICABILITY

Early to mid June. Upland breeding birds include all passerines (migratory songbirds), ptarmigan and shorebirds.

FIELD PROCEDURES

The method involves establishing permanent sample plots adjacent to the anticipated project footprint (mine plots) and at systematic distances along transects perpendicular from the footprint. Each plot will have a radius of 50 m. Beginning at the center of the nearest mine plot, five subsequent plots will be located at 150 m intervals from the center of the previous plot (*i.e.*, distance between edges of each plot is 50 m). Thus, six plots will be located within 900 m of the anticipated footprint. Ten more plots will be spaced at 300 m intervals (distance between plot edges is 200 m) providing a total of 16 plots within 3.9 km of the footprint along a single transect. Ten transects will be distributed around the mine footprint. A number of control plots will also be located greater than 10 km from the anticipated project footprint. Plots will be established to sample key upland and lowland habitats (*e.g.*, heath tundra, shorelines, riparian, tussock-hummock, and wetlands).

Surveys will be performed using standard point count procedures. All birds seen or heard within the plot will be recorded within three minutes, and five minutes. Birds recorded within three minutes can be used to supply data to the annual North American Breeding Bird Survey. Birds recorded within five minutes will be used for analysis. Flyovers and birds observed outside of the plot will be recorded, but excluded from the analysis. Surveys will be conducted during early to mid-June, and in the morning hours when birds are actively singing. Data that will be recorded includes: GPS location of plot, observation number, time of observation, species, number of individuals, habitat, and behavioural activity (*e.g.*, flushed, territorial calls or displays, nest or nest with eggs, flyovers).

Collecting Data

All observation data is to be recorded on the supplied data sheet. Data recorded includes observation number, time of observation, species (using species code), number of individuals, habitat, incidental (N or Y), and behavioural activity (*e.g.*, flushed, territorial calls or displays, nest or nest with eggs). Recording an "N" for an incidental observation implies that the individual was located on the plot with evidence of territorial behaviours such as territorial calls and displays, territorial disputes, nest building, mating, food carrying, leading behaviour (broken wing display), or confirmation of a nest. Birds seen or heard off the plot or not showing territorial behaviours (*e.g.*, flyovers) will be recorded as "Y" for incidental observations.

The results of bird surveys can be biased due to adverse weather conditions. If the wind is blowing too strongly or it is raining fairly hard, the survey will have to be postponed. Whether or not a survey will be cancelled due to poor weather conditions will be determined on site.

If no birds are observed in a plot, then enter a "0" in the Species column for that plot and survey date in the database.

EQUIPMENT AND MATERIALS

- GPS units;
- Binoculars;
- Tape Measure;
- Bird identification book; and,
- Data sheets, species codes, and classification for habitat.

TECHNICAL PROCEDURES – PRISM PLOT SURVEYS

PURPOSE

To collect regional data on upland breeding bird density, richness and diversity in the Central Arctic. Data are to be provided to the Canadian Wildlife Service.

APPLICABILITY

Early to mid June. Upland breeding birds include all passerines (migratory songbirds), ptarmigan and shorebirds. Data collection begins in 2008 and then every 4 to 5 years until decommissioning.

FIELD PROCEDURES

The PRISM method involves establishing nine random plots among high, moderate, and low quality shorebird habitat in a 6:2:1 ratio. Plots are 12 ha in size (400 m long x 300 m wide) and located in areas that should not be influenced by the mining operations (i.e., data is not meant for effects monitoring). Each site is to be staked off in such a way that twelve 25-wide transects can be established and marked inside the larger square plot. A sketch of the survey plot and topography (prominent landscape features) should be included on the back of the data sheet.

Surveys can be conducted at any time, but preferably after all point counts have been completed for the day. Transects within the plot will be traversed by two observers walking abreast, covering a 25 m wide survey strip. Thus each observer surveys a 12.5 m wide strip on their right and left sides. Surveyors will walk towards pre-established markers (stakes) to ensure that they are proceeding in a straight line. After some initial practice observers will be sensitive to the correct spacing and should be able to maintain this distance from each other.

It is important for surveyors to not only focus on the birds and nests around them but to also pay attention to what their survey partner is doing. When one surveyor stops to record an observation, the other surveyor must also stop and wait patiently until that individual has completed documenting their measurement. It is imperative that surveyors proceed in a uniform and parallel manner.

Upon reaching the far end of a given transect, the team will proceed immediately to the adjacent transect and survey the next 25 m wide strip parallel to the first one. In an attempt to keep double counting to a minimum the surveyor on the outside line will adopt the adjacent transect (the inside transect), going the opposite direction. Using a surveyor familiar with an adjoining transect reduces the chance of double counting bird territories

that may lie on the edge of a transect boundary. All transects are to be carried out consecutively without stopping for breaks between transects. Depending on the accessibility of the terrain, surveys can take 1 to 2 hours.

All data is to be recorded on the supplied data sheets. While on transect, seven types of data are to be recorded with each bird observation: species, probable nest, pair, male, female (or unknown), habitat type (Eco Unit), incidental observation, and comments (flushed, territorial display, leading behaviour). Nest locations should be marked and identified on the back side of the data sheet (i.e., on the sketch of the plot and topographic map).

For the survey, birds are only to be recorded as being "in" the survey during the actual survey period, from start to finish. During the survey, all birds that fall within 12.5 m on each side of observers will be recorded as "N" under incidentals. All other birds (e.g., flyovers, and groups of >5 birds) will be recorded as incidentals and will be marked as "Y" under incidentals on your data sheet.

The results of bird surveys can be biased due to adverse weather conditions. If the wind is blowing too strongly or it is raining fairly hard, the survey will have to be postponed. Whether or not a survey will be cancelled due to poor weather conditions will be determined on site. The purpose of the survey is to generate results that accurately reflect bird densities.

TECHNICAL PROCEDURES – WATERFOWL AERIAL SURVEYS

PURPOSE

To determine the natural variation in species density and richness in the study area during the northern migration/establishment of nesting territories, brood rearing period, and southern migration.

APPLICABILITY

Northern migration, brood rearing, and southern migration. Waterfowl include ducks (divers, dabblers and eiders), geese, swans, sandhill cranes, and loons.

FIELD PROCEDURES

Aerial surveys for water birds will be conducted on four to five survey blocks within the study area. One or two blocks will include lakes adjacent to the anticipated project area (i.e., Judge Sissons Lake), and three blocks will be used to survey lakes and the shoreline of larger water bodies such as Aberdeem, Schultz, Mallery, and Princess Mary lakes.

Survey blocks will consist of 16 km long transects oriented in an east-west direction, spaced 2 km apart (Larned *et al.* 2003). The mine block will consist of 12 transects, while each reference block will have six transects. Transects will be flown by helicopter at a speed of 80 to 100 km/h, and 45 m altitude using pre-determined UTM coordinates. Lower elevations and changes in direction may be required to accurately identify waterfowl species. Two observers will record all waterfowl observed within 200 m of either side of the aircraft, and within 2-km segments along each transect (i.e., 8 segments per transect). For each species identified, observations will be recorded into one of the following categories:

- Single - lone males or females;
- Pair - male and female in close association;
- Grouped males – two to four males in close association; and,
- Other groups – All remaining groups of three or more individuals in close association that can not be separated as singles or pairs. A group of two males and one female will be recorded as one pair and a single male.

The number of young in a brood will also be recorded during the brood rearing period. Surveys will occur during the northern migration/establishment of nesting territories (mid-June), brood rearing period (early-August), and southern migration (late-August).

Surveys should be conducted during the early to mid-morning. Each block should be surveyed twice, five days apart, during each period.

The following data will be recorded:

- type of survey (northern migration, brood rearing, southern migration);
- survey block (project, control)
- start time, finish time, duration of survey;
- transect number and segment;
- observation number;
- species (using species codes);
- group category (use group category classes); and,
- number of young (only for brood rearing period).

For each survey transect, if there are no observations, then enter “None” in the Species column for that transect, survey block, and survey date in the database.

EQUIPMENT AND MATERIALS

- GPS units;
- Binoculars;
- Bird identification book; and,
- Data sheets and species codes.

TECHNICAL PROCEDURES – RAPTOR SURVEYS

PURPOSE

To determine the natural variation in nest site distribution, occupancy, success, and productivity of raptors in the study area.

APPLICABILITY

Spring nesting, and summer nest success/fledgling periods. Raptors include peregrine falcon, gyrfalcon, golden eagles, owls, rough-legged hawks, and ravens.

FIELD PROCEDURES

The raptor survey will be conducted during two periods. The first survey will occur during the spring (early to mid-June) to determine occupancy of historical nest sites and identify potential new nests. The second survey will occur during summer (late-July to early-August) to determine the success and productivity of each nest.

Using a helicopter, observers will fly close to a known or newly found nest site, and then may land and hike into the site to carry out a ground investigation. All nests located in the study area during baseline studies will be re-visited. Proof of occupancy by a pair would be seeing at least one adult bird, two birds together, or finding a nest containing eggs or young. It is suggested that the location of a nest is well described during the spring survey, to aid in re-location of the nest during the summer survey.

For each nest site, one data sheet will be used to record information from each survey.

EQUIPMENT AND MATERIALS

- GPS units;
- Binoculars, spotting scope, tripod;
- Bird identification book; and,
- Data sheets.

APPENDIX III

2008 WORKSITE SPECIFIC GUIDE FOR THE WILDLIDE MITIGATION AND MONITORING PROGRAM

TECHNICAL PROCEDURES – Camp Activity

Summary of Activity:

- Project head quarters including helicopter and seasonal trucking pick-up and drop-off points for essential supplies, service and site staff
- It is planned to expand the 2007 temporary wooden camp by installing new sleeping accommodations and an addition to the latrine infrastructure.

Potential Impact:

- Aircraft and helicopter noise during take-off and landing
- Low level flying
- Equipment Noise (e.g., ATV's, snowmobiles, generators, etc.)
- Small animal move ins (e.g., ground squirrels, voles)
- Habitat loss

Mitigation and Implementation:

Caribou Mitigation

Based on information from the BQCMB (2006), the calving grounds for the Beverly and Qamanirjuak herds are approximately 70 km and 200 km from the proposed exploration areas, respectively. The distance between the Kiggavik camp and the nearest caribou water crossings is 25 km. During previous exploration activities, AREVA staff and contractors have observed several caribou per day traveling through the Judge Sissons Lake area. AREVA recognizes that there is a high probability that caribou will occur within the Project area during the northern and post-calving migration periods (i.e., April through September).

The following outlines caribou protection measures required or suggested during specific periods of the year and AREVA's follow-up action.

Mitigation Procedures for Caribou

The following procedures are practiced and enforced on site to mitigate potential impacts from exploration activities on caribou.

- Caribou have the "right-of-way" and are not blocked or deterred from moving through the Project area

- Taking-off or landing of aircraft does not occur if 50 or more caribou are in close proximity to one another and within 1 km of the aircraft.
- Track logs of helicopter flights are maintained.
- Monitoring the area for approaching caribou with the use of satellite collar information in conjunction with daily ground surveillance for caribou cows and calves, and observations during transport of contractors and site staff (following the flight altitudes for transportation described above).
- If a collared caribou is identified as being on the lease property or within 3.5 km, then verification will occur through an aerial reconnaissance survey (>300 m).
- Adherence to all mitigation and protection measures described for "Other Wildlife" by all site employees, contractors, and visitors.

Required activities and their applicable frequencies in the following table:

Activity	Frequency	Flying Altitude
Regular Long Distance Flights		>610 meters
Short Distance Flights		>300 meters – if achievable during duration of flight
Aerial Reconnaissance Surveys*	When required	>300 meters
Ground Behavior Observations	Daily	NA
Wildlife Log-Book	On event of viewing wildlife	NA

Mitigation Procedures for Raptors and Other Migratory Birds

- AREVA has implemented the following operating procedures to mitigate potential impacts to raptors and other migratory birds.
- Any land clearing activities (if necessary) will be conducted during late winter (April) outside of the nesting season (May through August) for migratory birds.
- Avoid disturbance to the nest sites of raptors and other migratory birds (i.e., songbirds and shorebirds). If a raptor nest is located incidentally within 1.5 km of exploration activities, then AREVA staff and contractors will be instructed to specifically avoid the nest site during late May through mid-July, and maintain a distance of at least 100 m from the nest during mid to late August (as recommended by the GN [GNDOE 2007]).
- An attempt will be made to prevent birds from nesting on man-made structures.
- If a nest site is established on a man-made structure and eggs are present, the nest will be avoided as much as possible and monitored for nest success.
- Adhere to all mitigation and protection measures described for "Other Wildlife".

Mitigation Procedures for Other Wildlife (Includes All Wildlife)

- AREVA will implement the following operating procedures to mitigate potential impacts to all wildlife.
- Perform exploration activities (camp layout, drilling) in a manner that limits the size of the Project footprint.
- The use of firearms is strictly controlled. The only allowable use of firearms is the use bear deterrence measures (e.g., shotguns, cracker shells and rubber bullets) as recommended by the GN (GNDOE 2007), and for safety kills to protect human life should a situation arises when other measures have failed.
- Prohibit hunting and trapping by AREVA employees and contractors.
- All wildlife has the "right-of-way".
- AREVA educates and enforces to site staff "no feeding or harassment of wildlife", and the appropriate response to animal encounters (especially carnivores and muskoxen). Staff will be required to follow the "Procedures in the "Safety in Bear Country Manual" as recommended by the GN (GNDOE 2007).
- Use of "good house keeping" practices to maintain a garbage-free camp and exploration area, should limit the attraction of animals to the project. All combustible garbage is burned in an incinerator and ash residue is placed in metal containers and disposed of in Baker Lake (see Waste Management Plan). Non-combustible waste is stored in the camp area and shipped to Baker Lake for disposal.
- If an incident occurs between a grizzly bear, wolverine, wolf, or fox and the exploration program, then the details of the incident will be described in a "Wildlife Incident Form" and AREVA will contact the local wildlife officer with the GN for appropriate protocols and actions. An incident is defined as wildlife-caused damage to camp facilities, continued persistence of a carnivore(s) within the camp or drill rig area, and interactions between humans and wildlife that lead to injury or death.
- All fuel burning equipment meet emission guidelines and are equipped with mufflers.
- All chemicals are stored in double-walled containers or in secondary containment. In addition, diesel fuel, gasoline, and aviation fuel is contained within arctic berms or double-walled storage tanks (see Spill Contingency Plan). In the event of a spill, the Spill Contingency Plan will be implemented immediately, and the spill reported to the appropriate authorities. Used chemicals are stored for transportation off site for proper handling.
- AREVA staff and contractors will record observations of caribou, other wildlife, and carnivore dens and raptor nest sites into a wildlife logbook

- All materials, chemicals, and equipment are removed from the drill sites and camp area at completion of the project as described in the Abandonment and Restoration Plan. The intent is to return the area as close as possible to the natural state.

Wildlife Log Book

In conjunction with the technical surveys conducted to collect scientific data, AREVA has provided a wildlife log book for all site personnel, contractors, and visitors to complete following the observation of any wildlife. Instructions regarding the log book are provided during orientation and/or arrival on site.

TECHNICAL PROCEDURES – Drilling Operations

Summary of Activity:

Bong and Granite Areas

- Diamond drilling will focus on existing targets on the Bong and Granite Grids, South and West of Kiggavik respectively.
- Diamond drilling will include 7 - 12 drill holes on Granite Grid and similar amounts of drilling on the Bong Grid (total of 14 -24 drill holes).
- Total meterage is expected to range between 3000 and 5000m.
- The drill hole size may be NQ or HQ
- Holes may be inclined (from vertical to 60^{o})
- Maximum depth 400m

Kiggavik Area

- Diamond drilling will focus on the existing Main Zone and Center Zone deposits
- Diamond drilling will include a total of 10 to 25 drill holes
- Total meterage is expected to range between 2000 and 4000m.
- The drill hole size will be HQ
- Holes may be inclined (from vertical to 60o)
- Maximum depth 300 m
- Holes below the permafrost will be packer tested
- Water samples will be collected using packer systems and swabbing tools. A pump will be required to pump all drill water from the hole during sampling. In order to pump out approximately 2 volumes before sampling, holding capacity on the order of 5 m^3 will be required.

Andrew Lake and End Grid Areas

- Diamond drilling will focus on the existing Andrew Lake and End Grid deposits, South West of Kiggavik.
- Diamond drilling will include 6 - 12 drill holes at Andrew Lake and similar amounts of drilling at End Grid (total of 12 -24 drillholes).
- Total meterage is expected to range between 2000 and 4000m.
- The drill hole size will be HQ
- Holes may be inclined (from vertical to 60^{o})
- Drill water will be directed to settling tanks prior to being re-circulated

- Maximum depth 400m
- Holes below the permafrost will be packer tested
- Water samples will be collected using packer systems and swabbing tools. A pump will be required to pump all drill water from the hole during sampling. In order to pump out approximately 2 volumes before sampling, holding capacity on the order of 5 m^3 will be required.

Potential Impact:

- Helicopter noise during take-off landing and pick-ups
- Low level flying
- Equipment Noise (e.g., Drills, ATV's, snowmobiles, generators)
- Animal encounters
- Habitat loss

Mitigation Procedures for Caribou

The following procedures are practiced and enforced on site to mitigate potential impacts from exploration activities on caribou.

- Caribou have the "right-of-way" and are not blocked or deterred from moving through the Project area
- Adherence to flying altitude requirements:
    - For long-range transportation flights and when travelling over large concentrations of caribou (50 or more individuals in close proximity to one another), the normal practice is to fly all aircraft at a minimum of 610 m above ground level. Exceptions may exist during take off and landing, low-level ceiling conditions, high winds, or other risks to flight safety flight safety.
    - For relatively shorter transportation flights (e.g., movement of staff and equipment between camp and ore bodies within the Kiggavik lease), the normal practice is to fly all aircraft at a minimum of 300 m above ground level. Exceptions may exist during take off and landing, low-level ceiling conditions, high winds, or other risks to flight safety flight safety.
- Taking-off or landing of aircraft does not occur if 50 or more caribou are in close proximity to one another and within 1 km of the aircraft.
- Track logs of helicopter flights are maintained.
- No drilling within 5 km of designated caribou crossings and not to construct a camp, cache fuel, or operate ground, air and water transportation equipment within 10 km of designated caribou crossings.

- Notifying EHS group is caribou are identified to be within 1 to 4 km of the drill site
- AREVA agrees to suspend all operations in accordance with Technical Procedure – Mitigation Measures for Caribou within 1 km of Drilling Operations (drilling, operation of ATVs, snowmobiles and water craft) if calves and cows are present within 1 km of exploration activities (50 or more individuals in close proximity to one another).
- Adherence to all mitigation and protection measures described for "Other Wildlife" by all site employees, contractors, and visitors.
- Use of mufflers on equipment and vehicles
- No feeding the wildlife
- No hunting

Required activities and their applicable frequencies and flying altitudes are presented in the following table:

Activity	Frequency	Flying Altitude
Regular Long Distance Flights		>610 meters
Short Distance Flights		>300 meters – if achievable during duration of flight
Aerial Reconnaissance Surveys*	When required	>300 meters
Wildlife Log-Book	On event of viewing wildlife	NA

*** If required, as per collared satellite data**

Mitigation Procedures for Raptors and Other Migratory Birds

- Any land clearing activities (if necessary) will be conducted during late winter (April) outside of the nesting season (May through August) for migratory birds.
- Avoid disturbance to the nest sites of raptors and other migratory birds (i.e., songbirds and shorebirds). If a raptor nest is located incidentally within 1.5 km of exploration activities, then AREVA staff and contractors will be instructed to specifically avoid the nest site during late May through mid-July, and maintain a distance of at least 100 m from the nest during mid to late August (as recommended by the GN [GNDOE 2007]).
- An attempt will be made to prevent birds from nesting on man-made structures.

- If a nest site is established on a man-made structure and eggs are present, the nest will be avoided as much as possible and monitored for nest success.
- Adhere to all mitigation and protection measures described for "Other Wildlife".

Mitigation Procedures for Other Wildlife (Includes All Wildlife)

- Perform exploration activities (camp layout, drilling) in a manner that limits the size of the Project footprint.
- For longer range flights within the project area (e.g., between the Kiggavik and Sissons leases), the normal practice is to fly all aircraft at a minimum of 610 m above ground level, except during take off and landing, and when ceiling conditions do not permit.
- For relatively shorter flights (e.g., between camp and ore bodies on Kiggavik lease), normal practice is to fly all aircraft at a minimum of 300 m above ground level, except during take off and landing, and when ceiling conditions do not permit.
- The use of firearms is strictly controlled. The only allowable use of firearms is the use bear deterrence measures (e.g., shotguns, cracker shells and rubber bullets) as recommended by the GN (GNDOE 2007), and for safety kills to protect human life should a situation arises when other measures have failed.
- Prohibit hunting and trapping by AREVA employees and contractors.
- All wildlife has the "right-of-way".
- AREVA educates and enforces to site staff "no feeding or harassment of wildlife", and the appropriate response to animal encounters (especially carnivores and muskoxen). Staff will be required to follow the "Procedures in the "Safety in Bear Country Manual" as recommended by the GN (GNDOE 2007).
- Use of "good house keeping" practices to maintain a garbage-free camp and exploration area, should limit the attraction of animals to the project. All combustible garbage is burned in an incinerator and ash residue is placed in metal containers and disposed of in Baker Lake (see Waste Management Plan). Non-combustible waste is stored in the camp area and shipped to Baker Lake for disposal.
- If an incident occurs between a grizzly bear, wolverine, wolf, or fox and the exploration program, then the details of the incident will be described in a "Wildlife Incident Form" and AREVA will contact the local wildlife officer with the GN for appropriate protocols and actions. An incident is defined as wildlife-caused damage to camp facilities, continued persistence of a carnivore(s) within the camp or drill rig area, and interactions between humans and wildlife that lead to injury or death.
- All fuel burning equipment meet emission guidelines and are equipped with mufflers.

- All chemicals are stored in double-walled containers or in secondary containment. In addition, diesel fuel, gasoline, and aviation fuel is contained within arctic berms or double-walled storage tanks (see Spill Contingency Plan). In the event of a spill, the Spill Contingency Plan will be implemented immediately, and the spill reported to the appropriate authorities. Used chemicals are stored for transportation off site for proper handling.
- AREVA staff and contractors will record observations of caribou, other wildlife, and carnivore dens and raptor nest sites into a wildlife logbook
- All materials, chemicals, and equipment are removed from the drill sites and camp area at completion of the project as described in the Abandonment and Restoration Plan. The intent is to return the area as close as possible to the natural state.

TECHNICAL PROCEDURES – Airborne Geophysics Surveys

Summary of Activity:

- Surveying will be done with a Cessna C208B Grand Caravan
- Instrumentation will record full tensor gravity gradiometry, gravity, triaxial magnetic gradiometry, digital video, and a complete digital terrain model from an inertially referenced laser (Lidar) altimeter system.
- The airborne gravity survey is slated to be finalised in the summer of the 2008.

Potential Impact:

- Helicopter noise during take-off landing and pick-ups
- Aircraft noise
- Low level flying
- Equipment Noise (e.g., ATV's, snowmobiles, generators)

Mitigation and Implementation:

Protection measures for conducting Aerial Geophysical Surveys (AGG).

- AREVA will only conduct AGG when caribou will not be disturbed by the survey.
- To meet requirements made by EC and GN, prior to initiating the survey program for the day, a reconnaissance flight is flown at an altitude of 300 meters over the initial line of the proposed route to determine the presence of caribou. If the ceiling is lower than the 300 meters but at an altitude that permits safe flying, the reconnaissance flight will be flown at the maximum altitude possible.
- If large quantities of caribou (50 or more individuals in close proximity to one another) are present within the area, then the aircraft will relocate to another part of the block and repeat the reconnaissance flight or will be postponed until the animals are a distance of 2 km from the survey area.
- If no caribou are observed within the survey route, then the survey proceeds at an altitude of 120 m.
- A continuous watch is kept for caribou during the survey.
- If caribou are observed in the study area during the survey, then the survey is aborted.

The proposed window for these surveys is in June, after the northern migration when the cows are on the calving grounds and outside of the study area.

Mitigation Procedures for Caribou

The following procedures are practiced and enforced on site to mitigate potential impacts from exploration activities on caribou.

- Caribou have the "right-of-way" and are not blocked or deterred from moving through the Project area
- Adhering to flying altitude requirements during transport of crew to survey location:
    - For long-range transportation flights and when travelling over large concentrations of caribou (50 or more individuals in close proximity to one another), the normal practice is to fly all aircraft at a minimum of 610 m above ground level. Exceptions may exist during take off and landing, low-level ceiling conditions, high winds, or other risks to flight safety flight safety.
    - For relatively shorter transportation flights (e.g., movement of staff and equipment between camp and ore bodies within the Kiggavik lease), the normal practice is to fly all aircraft at a minimum of 300 m above ground level. Exceptions may exist during take off and landing, low-level ceiling conditions, high winds, or other risks to flight safety flight safety.
- Taking-off or landing of aircraft does not occur if 50 or more caribou are in close proximity to one another and within 1 km of the aircraft.
- Track logs of helicopter flights are maintained.
- Adherence to all mitigation and protection measures described for "Other Wildlife" by all site employees, contractors, and visitors.

Required activities and their applicable frequencies and flying altitudes are presented in the following table:

Activity	Frequency	Flying Altitude
Regular Long Distance Flights		>610 meters
Short Distance Flights		>300 meters – if achievable during duration of flight
Wildlife Log-Book	On event of viewing wildlife	NA
Aerial Geophysical Surveys – Reconnaissance	Prior to conducting survey	>300 meters
Aerial Geophysical Surveys	As required	120 meters

Mitigation Procedures for Raptors and Other Migratory Birds

AREVA has implemented the following operating procedures to mitigate potential impacts to raptors and other migratory birds.

- Any land clearing activities (if necessary) will be conducted during late winter (April) outside of the nesting season (May through August) for migratory birds.
- Avoid disturbance to the nest sites of raptors and other migratory birds (i.e., songbirds and shorebirds). If a raptor nest is located incidentally within 1.5 km of exploration activities, then AREVA staff and contractors will be instructed to specifically avoid the nest site during late May through mid-July, and maintain a distance of at least 100 m from the nest during mid to late August (as recommended by the GN [GNDOE 2007]).
- An attempt will be made to prevent birds from nesting on man-made structures.
- If a nest site is established on a man-made structure and eggs are present, the nest will be avoided as much as possible and monitored for nest success.
- Adhere to all mitigation and protection measures described for "Other Wildlife".

Mitigation Procedures for Other Wildlife (Includes All Wildlife)

AREVA will implement the following operating procedures to mitigate potential impacts to all wildlife.

- Perform exploration activities (camp layout, drilling) in a manner that limits the size of the Project footprint.
- For longer range flights within the project area (e.g., between the Kiggavik and Sissons leases), the normal practice is to fly all aircraft at a minimum of 610 m above ground level, except during take off and landing, and when ceiling conditions do not permit.
- For relatively shorter flights (e.g., between camp and ore bodies on Kiggavik lease), normal practice is to fly all aircraft at a minimum of 300 m above ground level, except during take off and landing, and when ceiling conditions do not permit.
- The use of firearms is strictly controlled. The only allowable use of firearms is the use bear deterrence measures (e.g., shotguns, cracker shells and rubber bullets) as recommended by the GN (GNDOE 2007), and for safety kills to protect human life should a situation arises when other measures have failed.
- Prohibit hunting and trapping by AREVA employees and contractors.
- All wildlife has the "right-of-way".
- AREVA educates and enforces to site staff "no feeding or harassment of wildlife", and the appropriate response to animal encounters (especially

carnivores and muskoxen). Staff will be required to follow the "Procedures in the "Safety in Bear Country Manual" as recommended by the GN (GNDOE 2007).

- Use of "good house keeping" practices to maintain a garbage-free camp and exploration area, should limit the attraction of animals to the project. All combustible garbage is burned in an incinerator and ash residue is placed in metal containers and disposed of in Baker Lake (see Waste Management Plan). Non-combustible waste is stored in the camp area and shipped to Baker Lake for disposal.
- If an incident occurs between a grizzly bear, wolverine, wolf, or fox and the exploration program, then the details of the incident will be described in a "Wildlife Incident Form" and AREVA will contact the local wildlife officer with the GN for appropriate protocols and actions. An incident is defined as wildlife-caused damage to camp facilities, continued persistence of a carnivore(s) within the camp or drill rig area, and interactions between humans and wildlife that lead to injury or death.
- All fuel burning equipment meet emission guidelines and are equipped with mufflers.
- All chemicals are stored in double-walled containers or in secondary containment. In addition, diesel fuel, gasoline, and aviation fuel is contained within arctic berms or double-walled storage tanks (see Spill Contingency Plan). In the event of a spill, the Spill Contingency Plan will be implemented immediately, and the spill reported to the appropriate authorities. Used chemicals are stored for transportation off site for proper handling.
- AREVA staff and contractors will record observations of caribou, other wildlife, and carnivore dens and raptor nest sites into a wildlife logbook
- All materials, chemicals, and equipment are removed from the drill sites and camp area at completion of the project as described in the Abandonment and Restoration Plan. The intent is to return the area as close as possible to the natural state.

Wildlife Log Book

In conjunction with the technical surveys conducted to collect scientific data, AREVA has provided a wildlife log book for all site personnel, contractors, and visitors to complete following the observation of any wildlife. Instructions regarding the log book are provided during orientation and/or arrival on site.

TECHNICAL PROCEDURES – Ground Geophysics and Exploration Activities

Summary of Activity:

- Ground geophysics in 2008 will likely be limited due to the incomplete dataset obtained by the airborne program in 2007, however the airborne gravity survey is slated to be finalised in the summer of the 2008.

Potential Impact:

- Helicopter noise during take-off landing and pick-ups
- Low level flying
- Equipment Noise (e.g., ATV's, snowmobiles, generators)
- Animal encounters
- Habitat loss

Mitigation and Implementation:

Mitigation Procedures for Caribou

The following procedures are practiced and enforced on site to mitigate potential impacts from exploration activities on caribou.

- Caribou have the "right-of-way" and are not blocked or deterred from moving through the Project area
- Adhering to flying altitude requirements:
    - For long-range transportation flights and when travelling over large concentrations of caribou (50 or more individuals in close proximity to one another), the normal practice is to fly all aircraft at a minimum of 610 m above ground level. Exceptions may exist during take off and landing, low-level ceiling conditions, high winds, or other risks to flight safety flight safety.
    - For relatively shorter transportation flights (e.g., movement of staff and equipment between camp and ore bodies within the Kiggavik lease), the normal practice is to fly all aircraft at a minimum of 300 m above ground level. Exceptions may exist during take off and landing, low-level ceiling conditions, high winds, or other risks to flight safety flight safety.
- Taking-off or landing of aircraft does not occur if 50 or more caribou are in close proximity to one another and within 1 km of the aircraft.
- Track logs of helicopter flights are maintained.

- No drilling within 5 km of designated caribou crossings and not to construct a camp, cache fuel, or operate ground, air and water transportation equipment within 10 km of designated caribou crossings.
- Report to EHS Group is caribou are identified to be within 1 to 3.5km of working location
- Suspend all operations in accordance with Technical Procedure – Mitigation Measures for Caribou within 1 km of Drilling Operations (drilling, operation of ATVs, snowmobiles and water craft) if calves and cows are present within 1 km of exploration activities (50 or more individuals in close proximity to one another).
- Aerial surveys and ground-based surveys will include an independent wildlife monitor.
- Adherence to all mitigation and protection measures described for "Other Wildlife" by all site employees, contractors, and visitors.

Required activities and their applicable frequencies and flying altitudes are presented in the following table:

Activity	Frequency	Flying Altitude
Regular Long Distance Flights		>610 meters
Short Distance Flights		>300 meters – if achievable during duration of flight
Wildlife Log-Book	On event of viewing wildlife	NA

Mitigation Procedures for Raptors and Other Migratory Birds

- Any land clearing activities (if necessary) will be conducted during late winter (April) outside of the nesting season (May through August) for migratory birds.
- Avoid disturbance to the nest sites of raptors and other migratory birds (i.e., songbirds and shorebirds). If a raptor nest is located incidentally within 1.5 km of exploration activities, then AREVA staff and contractors will be instructed to specifically avoid the nest site during late May through mid-July, and maintain a distance of at least 100 m from the nest during mid to late August (as recommended by the GN [GNDOE 2007]).
- An attempt will be made to prevent birds from nesting on man-made structures.
- If a nest site is established on a man-made structure and eggs are present, the nest will be avoided as much as possible and monitored for nest success.
- Adhere to all mitigation and protection measures described for "Other Wildlife".

Mitigation Procedures for Other Wildlife (Includes All Wildlife)

- Perform exploration activities (camp layout, drilling) in a manner that limits the size of the Project footprint.
- For longer range flights within the project area (e.g., between the Kiggavik and Sissons leases), the normal practice is to fly all aircraft at a minimum of 610 m above ground level, except during take off and landing, and when ceiling conditions do not permit.
- For relatively shorter flights (e.g., between camp and ore bodies on Kiggavik lease), normal practice is to fly all aircraft at a minimum of 300 m above ground level, except during take off and landing, and when ceiling conditions do not permit.
- The use of firearms is strictly controlled. The only allowable use of firearms is the use bear deterrence measures (e.g., shotguns, cracker shells and rubber bullets) as recommended by the GN (GNDOE 2007), and for safety kills to protect human life should a situation arises when other measures have failed.
- Prohibit hunting and trapping by AREVA employees and contractors.
- All wildlife has the "right-of-way".
- AREVA educates and enforces to site staff "no feeding or harassment of wildlife", and the appropriate response to animal encounters (especially carnivores and muskoxen). Staff will be required to follow the "Procedures in the "Safety in Bear Country Manual" as recommended by the GN (GNDOE 2007).
- Use of "good house keeping" practices to maintain a garbage-free camp and exploration area, should limit the attraction of animals to the project. All combustible garbage is burned in an incinerator and ash residue is placed in metal containers and disposed of in Baker Lake (see Waste Management Plan). Non-combustible waste is stored in the camp area and shipped to Baker Lake for disposal.
- If an incident occurs between a grizzly bear, wolverine, wolf, or fox and the exploration program, then the details of the incident will be described in a "Wildlife Incident Form" and AREVA will contact the local wildlife officer with the GN for appropriate protocols and actions. An incident is defined as wildlife-caused damage to camp facilities, continued persistence of a carnivore(s) within the camp or drill rig area, and interactions between humans and wildlife that lead to injury or death.
- All fuel burning equipment meet emission guidelines and are equipped with mufflers.
- All chemicals are stored in double-walled containers or in secondary containment. In addition, diesel fuel, gasoline, and aviation fuel is contained within arctic berms or double-walled storage tanks (see Spill Contingency Plan). In the event of a spill, the Spill Contingency Plan will be implemented immediately, and the

spill reported to the appropriate authorities. Used chemicals are stored for transportation off site for proper handling.

- AREVA staff and contractors will record observations of caribou, other wildlife, and carnivore dens and raptor nest sites into a wildlife logbook
- All materials, chemicals, and equipment are removed from the drill sites and camp area at completion of the project as described in the Abandonment and Restoration Plan. The intent is to return the area as close as possible to the natural state.

Wildlife Log Book

In conjunction with the technical surveys conducted to collect scientific data, AREVA has provided a wildlife log book for all site personnel, contractors, and visitors to complete following the observation of any wildlife. Instructions regarding the log book are provided during orientation and/or arrival on site.

TECHNICAL PROCEDURES – Environmental Protection Plans

Summary of Activity:

- The 2008 Environmental, Health and Safety (EH&S) monitoring program will involve independent wildlife monitors from the Baker Lake community and AREVA field staff. The EH&S staff will be responsible for the implementation of the following plans: Radiation Protection Plan, Spill Contingency Plan, Waste Management Plan, Noise Abatement Plan, Wildlife Mitigation and Monitoring Plan, Abandonment and Restoration Plan.

Potential Impact

- Helicopter noise during take-off landing and pick-ups
- Low level flying
- Equipment Noise (e.g., ATV's, snowmobiles, generators)
- Animal encounters
- Habitat loss

Work Activities Undergone for Baseline Studies

AERIAL SURVEYS FOR CARIBOU AND MUSKOX:

FIELD PROCEDURES

The surveys will be conducted on 11 transect lines flown in a north-south direction following a predetermined flight path using GPS co-ordinates (Figure 1). Transect 1 and 2, and 10 and 11 are spaced 8 km apart, while the remaining transects are separated by a distance of 6 km. The study design intends to provide good coverage of the main project area while maintaining data quality by limiting observer fatigue. An important aspect of the study design and study area is to capture the natural variation in movement and abundance (frequency of use) of caribou along the Thelon River basin (i.e., crossings at Aberdeen and Schultz lakes) as they enter the anticipated project area during the post-calving migration. Presence of caribou in the study area will be determined from satellite collar information, communication with commercial pilots flying in the area, and information from site personnel and contractors. Approximately six to eight surveys will be completed each year from mid-April through September, depending on the presence of caribou in the region. If more than 1,000 caribou are present in the study area, then

surveys should be conducted every four to five days. This information will be critical for predicting effects from the proposed project.

Techniques

A helicopter will be used for all aerial surveys. In addition to the pilot, a navigator in the front seat will use a 1:250,000 scale map to follow a pre-determined flight path (transect coordinates should also be downloaded in the aircraft GPS unit). The navigator will record all observations of wildlife way point number in the GPS and on the data sheets. The navigator will also record species, number of animals in group (group size), group composition, dominant behaviour of the group, and habitat type on the data sheet provided (note that the way point [GPS location], group size and group composition are the critical attributes to record). During snow/ice cover conditions, habitat types should be classified as hilltop, valley, lake shore, or ice (i.e., frozen lake). Two observers situated in the rear seat on either side of the aircraft will communicate observations to the navigator/data recorder. Surveys will be conducted at 200 m above ground level (agl), at a speed of 130 to160 km/hour. All caribou and muskoxen within 600 m of either side of the helicopter will be counted, amounting to approximately 15% coverage of the study area. The location and direction of historic caribou trails (areas where the frequent migrations of caribou have left "scars" on the land) also will be recorded.

Estimates of the number of caribou snow tracks (not for muskox) will also be recorded during the northern migration and late post-calving migration (when there is greater than 50% snow cover). Information will be recorded on a separate data sheet by one of the observers. At two minute intervals (approximately 4 km to 5 km), each observer will estimate the number of trails observed during the previous two minutes as none (no tracks observed), low (occasional single tracks), moderate (regular single tracks or occasional trails), or high (continuous single tracks or large numbers of trails).

The following information will be recorded for caribou and muskox group observations:

- GPS location (way point), using hand held GPS or helicopter GPS;
- habitat type;
- number of animals in group;
- dominant composition of the group;
- number of calves and cows in group (when applicable); and
- dominant behaviour of group.

Incidental observations of other species will be made, but there will be no excessive deviation from the flight path in connection with such observations. Incidental observations of grizzly bears (and bear dens), wolves (and wolf dens), wolverines, raptors or raptor nest sites will be recorded on aerial survey data sheets. These observations will

later be recorded in the “incidental observation” database and not in the caribou and muskox aerial survey database.

If surveys detected no caribou or muskox, then a “0” should be entered on the data sheet and in the database for that date.

EQUIPMENT AND MATERIALS

- Binoculars;
- GPS units;
- Maps; and,
- Data sheets and classification codes for group composition and behaviour, and habitat.

CLASSIFICATION SYSTEM FOR CARIBOU AND MUSKOX GROUP COMPOSITION, BEHAVIOUR AND HABITATS

Caribou and Muskox Group Composition

Caribou and muskox will be classified to one of the following group types, based on the presence of calves in a group.

- Nursery (Nurse)– any group with calves (including solitary calves); and,
- Non-nursery (Nonnurse) – groups with no calves.

Caribou and Muskox Behaviour Categories

- Bed (B);
- Stand (S);
- Feed (F);
- Alert (A);
- Walk (W);
- Trot (T); and,
- Run (R).

Habitat Categories Based on ELC Classification.

- HT = heath tundra;
- HT-b = Heath tundra with 30-80% boulder;
- LV = lichen veneer (dry sedge – lichen). May be difficult to observe;
- SW = sedge wetland (wet meadow or emergent marsh);
- TH = tussock-hummock;
- RS = riparian shrub / birch seep (riparian willow);
- BE = greater than 80% bedrock (bedrock association);
- WAT = lake with open water (Lake);
- ICE = frozen lake (Lake – shallow or deep water); and,
- DS = disturbed by infrastructure.

CARIBOU ACTIVITY BUDGETS

FIELD PROCEDURES

Scan Sampling of Caribou Groups

Scan sampling of caribou groups or individuals from the ground will be used to monitor caribou behaviour as function of distance from the project. The method to be used is adapted from Curatolo and Murphy (1986), and will involve two observers. Observers should position themselves so that they do not influence caribou behaviour.

Individual caribou activities will be recorded as feeding, bedded, standing, alert, walking, trotting, or running. Individuals (not the dominant behaviour of the group) will be classified as feeding when they are actually foraging or searching for food (i.e., walking with head down).

The GPS location will be recorded, and observations will be conducted when caribou are present in the study area. Group composition will be classified, and the estimated number of animals in the group will be recorded. Also record the habitat type, and number of calves and cows in a group (if applicable).

The group will be scanned every 8 minutes for a minimum period of 32 minutes and a maximum of 80 minutes (i.e., four to ten observations per group). For each scan, the number of animals exhibiting a specific behaviour will be recorded (up to 30 to 40 animals can be scanned accurately). If the group is too large (i.e., greater than 40 animals), then focus on a smaller portion of the group. The group size does not have to be the same for each 8 minute scan. A strong attempt should be made to distribute the number of observations evenly over distances of less than 2 km from the project to distances up to 30 km from the project.

Response to Specific Stressors

For all caribou groups, instantaneous observations will be used to assess the response of caribou to different potential stressors as a function of distance. These observations will occur during scan sampling, and consequently, no increase in observation time will be required. In the event that a stressor is introduced during scan sampling, the observers will note the time (in the comments box) and record the response of caribou to the stressor as "no reaction" or "exhibiting a reaction" (i.e., alert posture, walking or running away from disturbance; see data sheet). The reaction of the majority of the group will be used in selecting the category. Estimated distance (meters) from the stressor will also be recorded. Stressors may include type of aircraft, project staff and insects (bot/warble flies, mosquitoes).

The observers will then wait until the animals resume previous behaviour (1 to 2 minutes), and begin scanning observations again.

EQUIPMENT AND MATERIALS

- Binoculars, spotting scope, tripod;
- Watches or stopwatches;
- GPS units; and,
- Data sheets and classification codes for group composition and habitat.

Mitigation

Mitigation Procedures for Caribou

The following procedures are practiced and enforced on site to mitigate potential impacts from exploration activities on caribou.

- Caribou have the "right-of-way" and are not blocked or deterred from moving through the Project area
- For long-range transportation flights and when travelling over large concentrations of caribou (50 or more individuals in close proximity to one another), the normal practice is to fly all aircraft at a minimum of 610 m above ground level. Exceptions may exist during take off and landing, low-level ceiling conditions, high winds, or other risks to flight safety flight safety.
- For relatively shorter transportation flights (e.g., movement of staff and equipment between camp and ore bodies within the Kiggavik lease), the normal practice is to fly all aircraft at a minimum of 300 m above ground level.

Exceptions may exist during take off and landing, low-level ceiling conditions, high winds, or other risks to flight safety flight safety.

- Taking-off or landing of aircraft does not occur if 50 or more caribou are in close proximity to one another and within 1 km of the aircraft.
- Track logs of helicopter flights are maintained.
- During the months of operations, AREVA employees a fully independent monitor (from the community of Baker Lake) to conduct aerial and ground-based caribou surveys (see the Wildlife Mitigation and Monitoring Plan, Section 5), and to determine the presence of cows and calves near exploration activities. The wildlife monitor interacts daily with the Facility Supervisor to plan activities, and can report back to the community and regulators on the effectiveness of mitigation and monitoring.
- AREVA is committed to not drilling within 5 km of designated caribou crossings and not to construct a camp, cache fuel, or operate ground, air and water transportation equipment within 10 km of designated caribou crossings.
- Rather than continuing with the daily aerial reconnaissance (>300m) surveys that where conducted during the 2007 season, AREVA is proposing the following.
    - Monitoring the area for approaching caribou with the use of satellite collar information in conjunction with daily ground surveillance for caribou cows and calves, and observations during transport of contractors and site staff (following the flight altitudes for transportation described above).
    - If a collared caribou is identified as being on the lease property or within 4 km, then verification will occur through an aerial reconnaissance survey (>300 m).
- AREVA agrees to suspend all operations in accordance with Technical Procedure – Mitigation Measures for Caribou within 1 km of Drilling Operations (drilling, operation of ATVs, snowmobiles and water craft) if calves and cows are present within 1 km of exploration activities (50 or more individuals in close proximity to one another).
- Aerial surveys and ground-based surveys will include an independent wildlife monitor.
- Adherence to all mitigation and protection measures described for "Other Wildlife" by all site employees, contractors, and visitors.

Required activities and their applicable frequencies and flying altitudes are presented in the following table:

Activity	Frequency	Flying Altitude
Regular Long Distance Flights		>610 meters
Short Distance Flights		>300 meters – if achievable

		during duration of flight
Aerial Reconnaissance Surveys*	When required	>300 meters
Aerial Surveys (collecting scientific baseline data) **		200 meters
Ground Behavior Observations	Daily	NA
Wildlife Log-Book	On event of viewing wildlife	NA
Aerial Geophysical Surveys – Reconnaissance	Prior to conducting survey	>300 meters
Aerial Geophysical Surveys	As required	120 meters

*** If required, as per collared satellite data**

**** Discussed in the Wildlife Mitigation and Monitoring Plan, Section 5 Caribou Monitoring and Baseline Data Collection**

Mitigation Procedures for Raptors and Other Migratory Birds

- Any land clearing activities (if necessary) will be conducted during late winter (April) outside of the nesting season (May through August) for migratory birds.
- Avoid disturbance to the nest sites of raptors and other migratory birds (i.e., songbirds and shorebirds). If a raptor nest is located incidentally within 1.5 km of exploration activities, then AREVA staff and contractors will be instructed to specifically avoid the nest site during late May through mid-July, and maintain a distance of at least 100 m from the nest during mid to late August (as recommended by the GN [GNDOE 2007]).
- An attempt will be made to prevent birds from nesting on man-made structures.
- If a nest site is established on a man-made structure and eggs are present, the nest will be avoided as much as possible and monitored for nest success.
- Adhere to all mitigation and protection measures described for "Other Wildlife".

Mitigation Procedures for Other Wildlife (Includes All Wildlife)

- Perform exploration activities (camp layout, drilling) in a manner that limits the size of the Project footprint.
- For longer range flights within the project area (e.g., between the Kiggavik and Sissons leases), the normal practice is to fly all aircraft at a minimum of 610 m above ground level, except during take off and landing, and when ceiling conditions do not permit.
- For relatively shorter flights (e.g., between camp and ore bodies on Kiggavik lease), normal practice is to fly all aircraft at a minimum of 300 m above ground

level, except during take off and landing, and when ceiling conditions do not permit.

- The use of firearms is strictly controlled. The only allowable use of firearms is the use bear deterrence measures (e.g., shotguns, cracker shells and rubber bullets) as recommended by the GN (GNDOE 2007), and for safety kills to protect human life should a situation arises when other measures have failed.
- Prohibit hunting and trapping by AREVA employees and contractors.
- All wildlife has the "right-of-way".
- AREVA educates and enforces to site staff "no feeding or harassment of wildlife", and the appropriate response to animal encounters (especially carnivores and muskoxen). Staff will be required to follow the "Procedures in the "Safety in Bear Country Manual" as recommended by the GN (GNDOE 2007).
- Use of "good house keeping" practices to maintain a garbage-free camp and exploration area, should limit the attraction of animals to the project. All combustible garbage is burned in an incinerator and ash residue is placed in metal containers and disposed of in Baker Lake (see Waste Management Plan). Non-combustible waste is stored in the camp area and shipped to Baker Lake for disposal.
- If an incident occurs between a grizzly bear, wolverine, wolf, or fox and the exploration program, then the details of the incident will be described in a "Wildlife Incident Form" and AREVA will contact the local wildlife officer with the GN for appropriate protocols and actions. An incident is defined as wildlife-caused damage to camp facilities, continued persistence of a carnivore(s) within the camp or drill rig area, and interactions between humans and wildlife that lead to injury or death.
- All fuel burning equipment meet emission guidelines and are equipped with mufflers.
- All chemicals are stored in double-walled containers or in secondary containment. In addition, diesel fuel, gasoline, and aviation fuel is contained within arctic berms or double-walled storage tanks (see Spill Contingency Plan). In the event of a spill, the Spill Contingency Plan will be implemented immediately, and the spill reported to the appropriate authorities. Used chemicals are stored for transportation off site for proper handling.
- AREVA staff and contractors will record observations of caribou, other wildlife, and carnivore dens and raptor nest sites into a wildlife logbook
- All materials, chemicals, and equipment are removed from the drill sites and camp area at completion of the project as described in the Abandonment and Restoration Plan. The intent is to return the area as close as possible to the natural state.

Daily Aerial Surveys

In 2008, AREVA is proposing to monitor the location of caribou with the use of satellite collar information in conjunction with daily ground surveillance for caribou cows and calves, and observations during the transport of contractors and site staff. Pilots and passengers will be instructed to watch for wildlife during regular transport. Observations during daily transportation of field staff at altitudes greater than 300 m (see the *Wildlife Mitigation and Monitoring Program, Section 3.1*) will provide the same information as the daily reconnaissance surveys conducted in 2007.

If a collared caribou is identified as being on the lease property or within 4 km, verification will occur through an aerial reconnaissance survey (>300 m). Upon verification of a group of caribou (50 or more individuals in close proximity to one another) within 1 km of Project activities, mitigation measures will be implemented (see the *Wildlife Mitigation and Monitoring Program, Section 3.1*).

Weekly Aerial Surveys

In 2008, weekly aerial surveys to monitor caribou within the mineral leases (Project area) will not be conducted. Instead, aerial surveys for caribou (and muskoxen) will focus on collecting baseline data to fulfill the expected requirements for an environmental Impact assessment (see the *Wildlife Mitigation and Monitoring Program, Section 5.2*).

Caribou Behaviour Observations

Ground observations focus on determining the proportion of time caribou spend feeding, bedded, standing, alert, walking, trotting, or running. The behaviour of each group or individuals (especially females with calves) is recorded at eight minute intervals for a total duration of no less than 32 minutes and no more than 80 minutes (i.e., four to ten scans per group). The reaction to stressors (e.g., vehicles, aircraft, staff working) by caribou as a function of distance also is recorded during scan sampling. Detailed technical procedures are provided in Appendix II.

Wildlife Baseline Surveys

Following positive results from the exploration and feasibility programs, AREVA will likely submit an application to develop a uranium mine, and it is anticipated that this will require an Environmental Impact Statement (EIS). To meet regulatory guidelines for the EIS, physical and biological aquatic and terrestrial baseline data will be required. Appendix I explains the rationale and objectives for the selection of wildlife species (i.e., valued components), study area boundaries, and baseline study designs. Details for the study designs and methods are presented in Appendix II.

Caribou Aerial Surveys

Data from satellite and GPS-collared female caribou provides information on the coarse-scale movement and distribution of the Ahiak and Beverly herds during baseline studies. Data from collared animals generally represents the seasonal and annual movement and distribution of the herd, however, sole use of this data is not sufficient for determining environmental design features, or predicting and testing effects from the Project. Collar data does not provide estimates of the number, group composition, and distribution of caribou that may interact with the Project. To achieve quality data for predicting and monitoring the effects of the Project on caribou it is proposed to obtain the combination of course, medium, and fine-scale information from collared animals, aerial transect surveys, and ground observations of behavior. Further rationale and objectives for the baseline aerial surveys are provided in Appendix I.

Baseline and monitoring programs at several projects in Nunavut and the NWT have successfully used systematic aerial surveys to obtain robust estimates of group size, group composition, number, and distribution (probability of occurrence) of caribou and muskoxen (see Appendix I for rationale). Surveys are flown along pre-determined transects at altitude of 200 m above ground level at speeds of 130 to 160 km/hour during the northern and post-calving migration periods (see Appendix II for details). The approach provides good visibility for detecting caribou groups and determining group composition, which is important for analyzing the effect of development on caribou distribution. Information from satellite-collared animals, commercial pilots, and site staff are used to help determine the timing of surveys.

Wildlife Log Book

In conjunction with the technical surveys conducted to collect scientific data, AREVA has provided a wildlife log book for all site personnel, contractors, and visitors to complete following the observation of any wildlife. Instructions regarding the log book are provided during orientation and/or arrival on site.