VIA COURIER

March 26, 2009

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Dear All:

Re: 2008 Annual Report for the Kiggavik Project
NWB 2BE-KIG0812

Please find enclosed the 2008 AREVA Resources Canada Inc. (AREVA) Annual Report for the Kiggavik Project and accompanying updated operational plans for your review, comment and distribution. The annual report and plans will be sent electronically as PDF files followed by hard copies via courier. A hard copy of the Bulk Fuel Storage Facility Report as provided by Golder Associates Ltd. will also be submitted.

This report fulfils the Nunavut Water Board Licence Part B, Item 2 for an annual report by March 31st that addresses the previous year of operation.

AREVA trusts that this annual report is a useful summary of the activities conducted in 2008. Please do not hesitate to contact me at 306-343-4043 with any questions or comments.

Yours truly,

Kim Sarauer
Environment and Radiation Protection Supervisor
AREVA Resources Canada Inc.
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cc:
ARC Distribution

AREVA Resources Canada Inc. - Kiggavik Project Field Program

2008 Annual Report

March 2009

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AREVA Resources Canada Inc.

KIGGAVIK PROJECT FIELD PROGRAM

2008 ANNUAL REPORT

Date of issue: March 2009

AREVA

AREVA Resources Canada Inc.

Kiggavik Project, Nunavut

Field Program

2008 Annual Report

Date of Issue: March 2009

APPROVAL FOR USE

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HISTORY OF REVISIONS

Version	Date	Details of Revision
1	March, 2009	• Original Release

Executive Summary

The following Annual Report is a summary of the 2008 field programs conducted at the Kiggavik Project and is required under Part B, Item 2 of Licence No. 2BE-KIG0812 issued by Nunavut Water Board (NWB)

The 2008 field program of the Kiggavik Project was focused on diamond drilling and ore and waste rock sampling in order to improve the understanding of known uranium deposits in the Kiggavik and Sissons areas. Diamond drilling was also performed on the Bong and Granite grids to further evaluate potential deposits on these sites. Drilling started on June 4, 2008. During the drilling period 7,760 metres was completed on 30 drill holes using NQ and HQ sized diamond core equipment. Ore and waste rock samples were collected from core drilled and sent to laboratories for testing. Detailed geotechnical logging was conducted on 19 holes. Packer tests were performed in deep holes that extended below the base of expected permafrost. Ground temperature data from the thermistors installed in 2007 continued to be collected.

Environmental baseline work in 2008 was focused on aquatic, terrestrial, wildlife and hydrological assessments. The program also included marine and archaeological components.

All drilling operations were conducted out of the Kiggavik camp and were supported by helicopter services and the Baker Lake office. In 2008, the camp accommodated up to 57 persons. There were no lost time incidents involving AREVA Resources Canada Inc. personnel and one lost time accident involving a contractor. The Wildlife Mitigation and Monitoring Plan was successfully implemented, protecting wildlife by avoiding conflicts and minimizing impacts within the Project area.

Occupational health and safety and radiation protection programs were implemented to ensure work was performed in a safe and responsible manner and that workers were not adversely exposed to radiation from uranium exploration activities.

A community consultation program was carried out to support all aspects of the Kiggavik Project, including the field program.

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ᑕᒪᒃᑯᐊ ᐊᑦᒐᒍᑕᒪᖅᓯᐅᑎᑦ ᑎᑎᕋᒃᓯᒪᓂᖏᑦ 2008 ᐱᓕᕆᐊᖑᓪᓚᐅᖅᑐᓂ ᑕᐃᒃᖓᓂ ᑭᒡᒐᕕᒃᒥ ᐱᓕᕕᖓᓂ ᑕᒪᒃᑯᐊ ᐱᔭᕆᐊᖃᑎᑕᐅᓯᒪᖕᒪᑕ ᑕᒪᑐᒨᖓ ᒪᓪᓕᒐᒥ ᓈᓴᐅᑎᖃᑐᒧᑦ ᐱ, ᑎᑎᖃᖓ 2 ᑕᒪᑯᓇᖕᓂ ᓚᐃᓴᒋᔭᐅᔪᒧᑦ ᓇᓴᐅᑎᖃᑐᖅ 2BE-KIG0812 ᑦᒃᕗᖓ ᑐᓂᔭᐅᓪᓚᐅᖅᑐᖅ ᑦᒧᑯᓇᖓᑦ ᓄᓇᖕᓄᑦ (ᐃᒪᓕᕆᔾᖏᓄᑦ.)

ᑕᒪᓐᓇ 2008 ᐱᓕᕆᐊᖑᓚᐅᖅᑐᖅ ᑕᐃᒃᖓᓂ ᑭᒡᒐᕕᒃᒥ ᐱᓕᕆᐊᖃᕈᐊᓚᐅᖅᑐᑦ ᑦᒪᑐᒥᖓ ᐃᑯᑦᑕᖅᓂᖅᒥᒃ ᐊᒪᓗ ᐅᔭᖃᓂᒃ ᖃᐅᔨᓴᖅᓂᕐᒥᒃ ᐅᔭᖃᓂᒃᓗ ᐊᑐᖅᓂᐊᖏᑐᓐᓂᒃ ᑕᒪᒃᑯᐊ ᑐᑭᓯᕙᓪᓕᖅᑎᑕᐅᔪᕆᐊᖃᓂᖏᖕᓄᑦ ᐱᕙᓪᓕᕈᑕᐅᓂᒃᓴᖏᓐᓄᑦᓗ ᑦᒪᑐᒪ ᓄᖑᓯᐃᑐᑉ ᐱᑕᖃᓂᓚᓂᒃ ᑕᐃᒃᖓᓂ ᑭᒡᒐᕕᒃᒥ ᐊᒪᓗ ᕿᑭᒃᑕᓕᒃᒥ. ᐃᑯᑕᓚᐅᖅᒥᔪᑦ ᐊᓯᖏᓂᑦᑕᐅ ᓇᖕᓂᓯᕕᐅᓯᔪᖓᓂ ᑕᒻᓇ ᖃᓄᖅ ᐊᖏᑎᓂᖃᒪᖓᓪᓚᑦ ᖃᐅᔨᓴᖅᓱᒍ, ᐃᑯᑕᐸᓕᐊᕆᐊᓚᐅᖅᑐᑦ ᔪᓐ 4, 2008 ᐃᑯᑦᑕᖅᓂᖃᓚᐅᖅᑐᑦ ᐊᖏᑎᕆᔪᒥᒃ 7,760 ᐱᖓᓱᑦ ᐊᒻᒐᐃᓂᒃ ᐃᑯᑦᑕᖅᓱᑎᒃ ᐊᑐᕐᓱᑎᒃ ᐊᖏᓂᖅᐸᓂᒃᓱ ᐊᑯᓕᖅᓂᒃᓱ ᐃᑯᑕᐅᑎᓐᓂᒃ. ᑦᒪᒃᑯᐊ ᐅᔭᕋᐃᑦ ᐊᑐᓂᐊᖏᑐᑦ ᑲᑎᖅᓱᖅᑕᐅᓚᐅᖅᑐᑦ ᐃᑯᑦᑕᖅᓂᑯᖕᓂᑦ ᐊᐅᓚᖅᑎᑕᐅᓚᐅᖅᑐᑦ ᖃᐅᔨᓴᖅᕕᒃᑯᑦ. ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᒥᔪᑦᓗ ᑕᒪᒃᑯᐊ ᐃᑯᑦᑕᐅᓂᑯᑦ 19ᖑᓚᐅᖅᑐᑦ ᖃᐅᔨᓴᖅᑕᐅᒥᓃᑎᒃᓱ ᑕᒪᑯᓇᖓᑦ ᐃᑯᑦᑕᓂᑯᑦ ᐊᑕᖕᓂᑐᑦ ᐊᑦᓯᑐᒻᒥᑐᑦ ᓄᖕᓇᑉ ᐃᓪᓗᐊᖕᓂ ᑦᒪᑐᒪ ᓄᖕᓇᐅᑉ ᕿᕿᖕᓂᖓᑕ ᐊᑕᓂᑦᑐᑦᒥᑦ. ᓄᓇᐅᑉ ᖃᖕᓄᐃᓂᖓᓄᑦ ᖃᐅᔨᓴᐅᑎᑦ ᐃᓕᐅᖃᑕᐅᓚᐅᖅᑐᑦ 2007ᒥ ᑲᑎᖅᓱᖅᑕᐅᕙᓪᓕᐊᖏᓐᓇᖅᑐᑦ.

ᐊᒻᕙᑎᓪᓕᕆᖕᓂᖅᒧᑦ ᐱᓕᕆᐊᖑᓐᓂᑯᑦ 2008ᒥ ᐱᓕᕆᐊᖑᓗᐊᓪᓘᓚᐅᖅᑐᑦ ᐃᒪᖅᒥ, ᓇᑎᖅᓇᒥ, ᓂᑦᖅᔪᑎᓕᕆᓂᖅᒧᑦᓗ ᖃᐅᔨᓴᖅᑕᐅᓂᖃᓚᐅᖅᑐᑦ.ᑕᒪᒃᑯᐊᓪᓗ ᐱᓕᕆᐊᖑᖃᑕᐅᓚᐅᖅᑐᑦ ᐃᒪᖅᒥᐅᑕᓕᕆᓂᖅ ᐊᒪᓗ ᖃᖓᓯᖅᓂᑕᓕᕆᓂᖅ.

ᑦᒪᖅᒥᒃ ᑕᒪᒃᑯᐊ ᐃᑯᑦᑕᓚᐅᖅᑐᑦ ᑕᐃᒃᖓᑦ ᑭᒡᒐᕕᒃᒥᑦ ᐱᕆᐊᓪᓚᐅᖅᑐᑦ ᐃᑲᔪᖅᑎᖃᕈᑎᒃ ᖁᓖᒥᒍᓕᖕᓂᒃ ᐊᒪᓗ ᖃᒪᓂᑐᐊᖅᒥ ᑎᑎᕋᕕᖓᓂᑦ. 2008ᒥ ᐱᓕᕆᔾᖃᓲᐅᖅᑐᖅ ᐊᒥᓱᑎᕆᔪᓐᓂᒃ 57. ᐱᓕᕆᔪᑎᑎᒍᑦ ᐊᓯᐅᔾᔨᓂᖅᑖᖃᓚᐅᖖᒋᑐᖅ ᓱᓇᑐᐃᓇᕐᒧᑦ ᐊᓃᕙᒃᑯ ᑲᓈᑕᒥ ᐱᓕᕆᔾᖏᓂᒃ ᐊᑕᐅᓯᖅᒥᒃ ᐱᑦᕆᐊᕿᔪᖃᓚᐅᖅᑐᖅ ᑲᓐᑐᕋᒃᖃᑐᒥᒃ. ᑕᒪᒃᑯᐊ ᐅᒪᔪᓕᕆᓂᒃᒧᑦ ᖃᐅᔨᓴᖅᓂᐅᓚᐅᖅᑐᑦ ᐱᑦᓯᐊᓚᐅᖅᑐᑦ ᒥᐊᓂᖅᓯᓂᖅᓯᐊᕐᓯᑎᒃ ᓂᖅᔪᑎᓂᒃ ᐃᔅᓱᐃᓵᖅᑐᖃᓚᐅᖏᑐᖅ ᑕᒪᒃᑯᓄᖓ ᓂᖅᔪᑎᓄᑦ ᐱᓕᕆᕕᐅᔪᒥᒃ.

ᐱᓕᕆᖕᓂᖅᒧᑦ ᐅᑦᔾᖅᑐᕆᐊᖃᓂᖅᒧᑦ ᐅᑦᖅᓇᑐᖃᓂᖅᒧᑦ ᒥᐊᓂᖅᓯ'ᑐ'ᑎᑦ ᐊᕿᑕᐅᓯᒪᓚᐅᖅᑐᑦ ᐊᑐᓚᐅᖅᑐᑦ ᑕᒪᒃᑯᐊ ᐱᓕᕆᐊᖑᔪᑦ ᓇᒪᓯᐊᖁᑉᓗᕆᑦ ᐅᓗᕆᐊᓇᖅᑐᖃᖅᑯᖅᓇᒍ ᑕᒪᒃᑯᐊᓗ ᐱᓕᕆᐅᔪᑦ ᐊᒃᑐᑕᐅᔪᖃᖅᑯᖅᓇᕆᑦ ᑕᒪᑐᒪᖓᑦ ᓄᖑᓯᐃᑐᓪᓕᕆᖕᓂᖅᒥᑦ ᑦᒪᑐᒪᖓᑦ ᐱᓕᕆᕕᕆᔭᖓᓂᒃ.

ᓄᖕᓇᓕᒃᓂᒃ ᖃᐅᔨᕆᐊᖕᓂᖅ ᐱᓕᕆᐊᖑᓚᐅᖅᒥᔪᖅ ᐃᑲᔪᑕᐅᓂᖅᑲᕆᐊᖅᓂᖕᓗᓄᑦ ᑦᒪᑐᖓ ᑭᒡᒐᕕᒃᒥ ᐱᓕᕆᕕᐅᔪᖅ, ᐱᓕᕆᐊᕆᔭᖏᓐᓂᒃᓱ ᓄᖕᓇᒥ.

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1 SUMMARY OF ACTIVITIES UNDERTAKEN IN 2008

1.1 General

Field activities undertaken by AREVA Resources Canada Inc. (AREVA) and its contractors in 2008 have included feasibility work, deposit appraisal, exploration work and environmental baseline work:

- Feasibility work in 2008 was focused on diamond drilling in the Kiggavik and Sissons areas for the purposes of ore and waste rock sampling in order to improve the understanding of the known mineral deposits. Activities also included geotechnical logging, packer testing and ground temperature measurements.
- Exploration geological work in 2008 was focused on diamond drilling in the Bong and Granite areas.
- Environmental baseline work in 2008 was focused on aquatic, terrestrial, wildlife, hydrological, and marine assessments. The program also included an archaeological component.

Operations were conducted out of the Kiggavik camp and were supported by helicopter services and the Baker Lake office. In 2008 the camp accommodated up to 57 persons. Main Project contributors were as follows:

Activity	Contributors
Management	AREVA
Drilling	Boart Longyear
Geological logging and probing	AREVA
Ore and waste rock sampling	AREVA
Geotechnical logging	SRK
Packer testing and thermal monitoring	SRK
Environmental Baseline Work/Aquatic studies	Golder
Environmental Baseline Work/archaeology	Golder
Environmental Baseline Work/Hydrology	Golder
Environmental Baseline Work/Wildlife studies	Gebauer
Environmental Baseline Work/Marine studies	Nunami Jacques Whitford
Civil Engineering Studies	EBA Engineering
Wildlife Monitoring	AREVA & NPS
Helicopter	Forest Helicopters
Environment, Health and Safety	AREVA
Occupational First Aid & Catering	1984 Enterprises
Camp expansion	BLCS
Camp operations & maintenance	AREVA & NPS
Fuel and other Overland Transportation	Peter's Expediting
Expediting	AREVA & Peter's Expediting

1.2 Camp Activities

The temporary wooden camp at the Kiggavik site was expanded in 2008 with additional new buildings, including: 1 generator shack, 6 sleeping units, 3 core logging tents and an Exploration office. Major renovations were done to expand the men's and ladies washroom and dry facilities. Figure 1.1 shows aerial views of the Kiggavik camp in August 2008.

During the third week of September the site was prepared for seasonal abandonment with equipment and supplies that can withstand winter conditions placed in storage, while supplies and equipment requiring heated storage were brought to Baker Lake. The generator was shut down and winterized. Waterlines were drained, flushed, and winterized with antifreeze. All buildings were secured. Windows and doors of all buildings were boarded up for the winter. All personnel vacated the site by September 21, 2008. Figures 1.2 and 1.3 show aerial views of the winterized Kiggavik camp and lay-down area in September 2008.

1.3 Fuel Cache

Two primary fuel cache locations were utilized:

- Fuel cache at esker: 14W 561512, 7145240
- Fuel cache at Kiggavik camp: 14W 564464, 7146782

All drums of jet fuel and diesel fuel were stored in approved 205 litre steel drums. All fuel containers were labelled, identifying the contents and AREVA's name. Fuel drums were stored within a secondary containment system. Figure 1.4 shows an aerial photo of the fuel cache.

Six 50,000L double walled steel EnviroTanks tanks for fuel storage were transported to the esker between January and March 2008. It is AREVA's intention to have these tanks functioning for the 2009 field season. Please refer to Section 2.3 for further details.

1.4 Drilling and Sampling

1.4.1 Deposit Appraisal Program

Drilling started on June 4, 2008. During the drilling period 4,148 metres were completed on 19 drill holes using NQ and HQ sized diamond core equipment. Drilling rates were generally low. All drill core has been geologically and geotechnically logged. Ore and waste rock samples were collected from core drilled in holes and sent to the laboratory for testing. Table 1.1 includes a summary of the 2008 drilling program.

1.4.2 Exploration Program

Diamond drilling for exploration was carried out on two areas in 2008: the Bong Grid and the Granite Grid. Drilling started on June 14, 2008. During the drilling period 3,612 metres was completed on 11 drill holes using NQ sized diamond core equipment. Diamond drilling on the Bong Grid included 10 holes for 3,429 meters. Diamond drilling on the Granite Grid included one hole for 183.6 meters.

Bong Grid

Hole Bong-044 terminated mineralization to the southeast while holes to the northwest extended the mineralization in that direction. Only five holes were able to be probed and only two of those in their entirety, due to technical problems. Five of the 10 holes were drilled to completion. There appears to be two main mineralized lenses plunging to the west-southwest in the northern area of the Bong Grid, increasing in grade and thickness in that direction, but their extent is unknown at this time. Mineralization is broadly coincident with a halo of bleaching, local sporadic argillization, illitization and Fe-Mg chlorite depletion. Chemically there is a distinct Fe_2O_3 depletion coincident with Na_2O_3 depletion in the altered zone. Steeply-dipping structures are ubiquitous and appear in numerous directions cross-cutting the flat-lying stratigraphy. The entire area consists of psammo-pelitic gneiss overlain by quartzite, cross cut by numerous generations of granitoid, syenite, diabase and lamprophyre dikes. Structurally, all lithologic units are cross-cut by at least three orientations of faults. Faulting is locally present in mylonite zones.

Highlights of the program on Bong Grid include a GT of 38.87 (m%) at 0.05% eU cutoff in Bong-039.

Granite Grid

Only one hole was completed on the Granite Grid in 2008. GG-020 (183.6m) intersected mostly psammo-pelitic to arkosic gneiss with interbeds of more pelitic lithologies. Mineralization was weak and occurred in weakly altered pelitic gneiss. There is good correlation of mineralization from the west to the east, and although probing was not possible, it appears that it is of low-grade nature.

Table 1.2 Summary of 2008 Drill Holes

			Location (UTM NAD 83)			DH Orientation		Drilling date			
HOLE id	Area	Zone	UTM X Easting	UTM Y Northing	Elevation (m)	Azimuth (TN)	Dip	Start	Finish	Length (m)	Core diameter
MZ-08-01	Kiggavik	Main Zone	564930	7146889	186	0	-90	4-Jun-08	5-Jun-08	117	NQ
MZ-08-01-B	Kiggavik	Main Zone	564930	7146889	186	60	-85	5-Jun-08	6-Jun-08	108	NQ
MZ-08-02	Kiggavik	Main Zone	564930	7146926	182	0	-90	8-Jun-08	12-Jun-08	285	NQ
MZ-08-03	Kiggavik	Main Zone	565293	7147003	181	0	-90	12-Jun-08	17-Jun-08	237	HQ
MZ-08-04	Kiggavik	Main Zone	565143	7146929	178	244	-76	7-Jun-08	18-Jun-08	340.5	HQ
MZ-08-05	Kiggavik	Main Zone	564956	7146893	186	333	-80	19-Jun-08	22-Jun-08	150	HQ
MZ-08-06	Kiggavik	Main Zone	565008	7146861	187	333	-75	20-Jun-08	23-Jun-08	93	HQ
MZ-08-07	Kiggavik	Main Zone	564875	7146852	186	333	-67	23-Jun-08	26-Jun-08	126	HQ/NQ
CZ-08-01	Kiggavik	Center Zone	565877	7147315	182	0	-90	2-Sep-08	9-Sep-08	273	NQ
EZ-08-01	Kiggavik	East Zone	566527	7147305	177	0	-90	10-Sep-08	11-Sep-08	72	NQ
AND-08-01	Sissons	Andrew Lake	553384	7134861	168	0	-90	26-Jun-08	5-Jul-08	255	HQ
AND-08-02	Sissons	Andrew Lake	553371	7134662	166	0	-90	10-Aug-08	30-Aug-08	183	NQ
AND-08-03	Sissons	Andrew Lake	553356	7134763	167	0	-90	27-Jun-08	7-Jul-08	204	HQ
AND-08-04	Sissons	Andrew Lake	553327	7134892	167	92	-60	7-Jul-08	9-Aug-08	300	HQ3
AND-08-05	Sissons	Andrew Lake	553480	7134728	168	220	-55	2-Sep-08	10-Sep-08	357	NQ
END-08-01	Sissons	End Grid	554609	7135838	166	320	-80	10-Aug-08	7-Sep-08	204	HQ3
END-08-02	Sissons	End Grid	554592	7135860	172	320	-80	9-Sep-08	16-Sep-08	459	NQ
END-08-03	Sissons	End Grid	554577	7135881	167	320	-80	5-Jul-08	24-Jul-08	36	HQ
END-08-03A	Sissons	End Grid	554577	7135881	167	320	-80	2-Aug-08	17-Aug-08	348	HQ
BONG-036	Bong	Bong	562391	7144061	155	280	-74	14-Jun-08	21-Jun-08	441	NQ
BONG-037	Bong	Bong	562392	7144061	155	0	-90	22-Jun-08	27-Jun-08	350	NQ
BONG-038	Bong	Bong	562392	7144061	155	280	-68	27-Jun-08	4-Jul-08	333	NQ
BONG-039	Bong	Bong	562322	7144082	156	285	-80	4-Jul-08	13-Jul-08	492	NQ
BONG-040	Bong	Bong	562322	7144082	156	285	-72	13-Jul-08	15-Jul-08	117	NQ
BONG-040A	Bong	Bong	562322	7144082	156	285	-74	15-Jul-08	22-Jul-08	279	NQ
BONG-041	Bong	Bong	562219	7144121	159	0	-90	22-Jul-08	28-Jul-08	302	NQ
BONG-042	Bong	Bong	562323	7144136	157	0	-90	30-Jul-08	7-Aug-08	459	NQ
BONG-043	Bong	Bong	562368	7144116	156	0	-90	8-Aug-08	10-Aug-08	498	NQ
BONG-044	Bong	Bong	562467	7143886	157	0	-90	20-Aug-08	22-Aug-08	158	NQ
GG-020	Granite	Granite	560107	7145821	179	0	-90	23-Aug-08	2-Sep-08	183.6	NQ

1.5 Packer Testing and Water Sampling

Ten packer tests were performed in five deep holes (MZ-08-03, MZ-08-04, AND-08-01, AND-08-04 and AND-08-05) that extended below the base of expected permafrost. The holes tested were drilled using HQ or NQ diamond coring equipment, and packer testing carried out using a hydraulically inflated wireline packer testing. All tests resulted in very low injection inflow and a low estimate of apparent hydraulic conductivity between $1x10^{-9}$ m/s and $8x10^{-8}$ m/s, approximately, as expected in the deep bedrock environment. One test conducted on hole MZ-08-03 at Main Zone resulted in an apparent higher hydraulic conductivity (~ 10^{-6} m/s). However this test was considered unsuccessful as a leakage of injected test water up the annulus of the drill casing occurred.

Water sampling was planned for drill holes that penetrated the bottom of permafrost where packer testing was carried out. However, challenges with respect to packer testing (rods becoming stuck or freezing in, etc...) and the low hydraulic conductivity rock mass encountered made in-situ water sampling unsuccessful.

Water samples were collected from three apparent flowing artesian holes (MZ-08-04, Bong-41 and End-08-02, coordinates as in Table 1.1) and were shipped to the Saskatchewan Research Council (SRC) Laboratory for analysis. However, this sampling did not follow expected protocol; a review of the laboratory results indicates that the water collected is predominantly local lake water used in the drilling and is not representative of deeper formation water. Future sampling efforts will strive to adhere to established protocols.

1.6 Thermistor Installation and Monitoring

One shallow and two deep thermistor strings were installed as part of the 2007 field program. The shallow thermistor string was linked to a datalogger. Four single point temperature probes with dataloggers were also installed during the 2007 field program. The first unit was attached outside the office cabin at the Kiggavik camp, 1.8 m above ground and recorded the ambient air temperatures. The second unit was inserted at 15 cm depth into tundra soil in a relatively flat area. The third unit was placed between large boulders in a prominent boulder field near Main Zone. The last sensor was placed in a shallow lake south-west of the Kiggavik camp, in about 1.5 m of water. Temperature data continued to be collected from these units in 2008. Preliminary interpretation over the September 2007 – June 2008 period shows a range in temperatures depending on the surface conditions, with the temperatures measured in the boulder field being dampened considerably. This is likely due to snow and ice entrapped between the boulders acting as insulation.

The depth of permafrost was inferred from temperature profiles measured with deep thermistor strings in selected boreholes. At Kiggavik, the estimated depth to the bottom of permafrost is about 210 metres. At Sissons site, 10 km south-west of Kiggavik, the permafrost depth is estimated to be between 250 and 270 metres below ground surface.

The temperature data collected in 2008 at Kiggavik and Andrew Lake (i.e., inside MZ-07-03 and ANDW-07-01) is essentially the same as in 2007 with the exception of some erratic readings / high temperature values recorded locally within the frozen ground. These high temperature values are likely due to faulty thermistors.

1.7 Civil Engineering Work

In the Baker Lake area a site visit was undertaken in June to review the ice conditions on the Thelon River and the potential dock sites on the southern shores of Baker Lake. The visit was timed correctly to view the ice breakup on the Thelon River. At the request of the Kiggavik Baker Lake Community Liaison Committee (CLC), meetings were

organized with elder members of the CLC to receive their input on historical ice conditions.

A field bathymetry program was undertaken and information on the south shore of Baker Lake and the Thelon River was obtained. Less detailed information than initially planned was obtained due to bad weather and inability to secure a reliable boat. Sufficient data was picked up however to enable the port designers to determine if a port facility is feasible on a conceptual basis.

In the Kiggavik area field route reconnaissance and site investigations for proposed infrastructure were conducted, including the Sik Sik Lake Dam, the Drumlin and Pointer Lake Airstrips, the Mill site and the Andrew Lake Retention Berm. A ground penetration radar investigation of the mill site, power plant, tank farms, ore pad and Sik Sik Lake took place from Sept 15-21.

1.8 Environment, Health and Safety Monitoring

The 2008 Environmental, Health and Safety program was implemented and carried out by AREVA staff. The wildlife monitoring program involved independent wildlife monitors from the Baker Lake community and AREVA field staff.

Wildlife Monitoring

Caribou protection measures were in place throughout the drilling period and local wildlife monitors were employed. Records were kept of wildlife observed near camp and during flights. Less than 450 caribou were observed during the drilling period. The largest group (approximately 200 animals) was observed at approximately 50 km from the camp. Muskox and wolves were seen near the site on several occasions. During field work, crews also observed several other mammals (arctic fox, lemming, and siksik) and birds (ptarmigan, ducks, geese, cranes, and other birds).

Altitude restrictions were in place for all helicopter flights as per AREVA's Noise Abatement Plan and Wildlife Mitigation and Monitoring Plan. Variable weather conditions in early June and fog in mid and late June caused many flights to be flown at lower than the desired altitudes. In July and August ceilings were generally higher allowing Project altitudes to be maintained more frequently. During September low ceilings required lower altitudes to be flown for the most of the flights. Weather also grounded the helicopter on some days.

Environment Protection

All drill sites were subject to gamma radiation surveys prior to conducting any drilling activities and again following completion of the hole. If elevated levels of gamma radiation were detected during the post-operational survey, clean-up activities were

conducted followed by another gamma survey to ensure remaining gamma radiation readings are below the cleanup criterion of 1 µSv/h.

Three environmental incidents (spills) occurred and were reported during the 2008 season. These are summarized in Section 12. The Spill Contingency Plan was adequately engaged for all three incidents, to ensure proper response, reporting and clean-up of the impacted sites.

Occupational Health and Safety

There were no lost time accidents in 2008 involving AREVA personnel. There was one lost time accident involving a contractor. A helicopter incident occurred when drill split tubes (very long, light hollow aluminum tubes) were caught in the helicopter rotor during unloading. The impact of the split tubes with the rotor caused the helicopter to vibrate severely. The pilot sustained an arm injury while jumping clear of the helicopter during the incident.

From the helicopter accident investigation it was determined that the practice of carrying long, light materials underneath idling rotors in unpredictable environments created the potential for serious injury and equipment damage. Worker complacency and inattention can exacerbate the risk of incident. A number of recommendations were made in the report including the need for additional helicopter safety training for workers and improved operating practices for the loading and offloading of equipment while the helicopter is operating. In February 2009, AREVA is holding a training session for employees who may be at the Kiggavik site during the 2009 field season. The session, facilitated by experienced transportation safety consultants, will focus on helicopter safety in exploration and mine development projects.

Radiation Protection

A Radiation Protection program was implemented to ensure work activities were performed in a safe and responsible manner and that workers were not adversely exposed to radiation from Project activities.

The Radiation Protection program was conducted using:

- Gamma dosimetry: OLDs (Optically stimulated Luminescent Dosimeter) and DRDs (Direct Reading Dosimeter) for personnel dosimetry
- Automess survey instruments for gamma radiation monitoring
- Ludlum survey Instrument / pancake probe and swipes for contamination monitoring
- Portable sample counters and air pumps for radon progeny and long lived radioactive dust (LLRD) monitoring
- Cairs radon monitors placed in core shacks
- Track etch cups for environmental radon monitoring

- 4 PS vols also for environmental radon monitoring

No Code of Practice dosimetry action levels were exceeded during the 2008 program. The worker radiation doses observed were well below regulatory dose limits for members of the public (1 mSv/a) or occupational workers (20 mSv/a). During the 2008 program, worker gamma radiation exposures ranged from 0.00 mSv to 0.51 mSv with an average exposure of 0.02 mSv.

The highest gamma radiation exposure was received by a driller. Worker exposures from radon progeny (RnP) and long-lived radioactive dust (LLRD) were conservatively estimated from workplace monitoring to be less than 0.05 mSv and 0.06 mSv respectively.

1.9 Environmental Baseline Work

1.9.1 Hydrology

The first hydrological field trip was undertaken by Golder Associates hydrologists in early June to collect stream discharges and measure flows during the snowmelt period. Multiple discharge measurements were taken on stream flow monitoring stations that were established in 2007. Leveloggers were installed including at the locations of historic Environment Canada hydrometric stations on Qinguq Creek and the Anigaq River. Lake elevations were measured.

A second hydrological field trip was undertaken in July. A local wildlife monitor from Baker Lake accompanied the hydrology crew over the field survey period. Multiple discharge measurements were taken on stream flow monitoring stations that were established in 2007. Levelogger data were downloaded and additional lake elevations were measured. At four of the proposed bridge crossing locations along the access road to Kiggavik, stream discharge was measured and channel and floodplain topography were surveyed. At the fifth crossing location on the Thelon River, channel banks and water level were surveyed on the left and right banks

For the final surface hydrological investigations the hydrology field crew arrived at Kiggavik on August 31, 2008. Field staff remained on site until September 4, 2008. A local wildlife monitor from Baker Lake accompanied the hydrology crew for most of the field survey period.

1.9.2 Aquatic - Freshwater

The first Golder Aquatic field crew arrived in Baker Lake on June 16, 2008. Two local assistants from Baker Lake participated in the spring field session. Field staff left Baker Lake on June 27, 2008. Field activities conducted during this first campaign included water quality sampling, habitat mapping videography of the streams and fishing (i.e., electrofishing and angling and dip netting).

The second Golder aquatic field crews arrived in Baker Lake on July 21, 2008. One local assistant from Baker Lake participated in the summer field session. Field staff left Baker Lake on August 7, 2008. Water quality sampling stations were established in several lakes. Due to its size and potential variability, five water quality stations were established in Judge Sissons Lake. Phytoplankton, zooplankton, and chlorophyll *a* samples were collected concurrently with the water quality samples. Fish community surveys and fish tissue chemistry collection were performed. Habitat mapping was completed on all lakes which had not previously been assessed. A bathymetry survey was also completed on four lakes (i.e., Rock Lake, End Grid Lake, Calf Lake and Siamese Lake).

For the final aquatic investigations the field crew arrived at Kiggavik on August 31. A complete set of water quality samples (i.e., physical parameters, nutrients, metal, etc.) was taken at each water quality sampling station. Additionally, five duplicate water quality sets were collected and submitted with a trip blank and a field blank as quality assurance measures. Phytoplankton, zooplankton, and chlorophyll *a* samples were collected concurrently with the water quality samples on six lakes. Sediment chemistry samples were also collected. Collection of erosional and depositional benthic invertebrate community, particle size and periphyton samples took place in streams.

A lake trout spawning survey was performed on 14 lakes to determine if lake trout were utilizing any of the lakes as spawning grounds.

A few large-bodied lake trout and arctic grayling were captured and tagged with a Passive Integrated Transponder (PIT) tag to identify possible movement patterns in future studies. None of the fish captured were recaptures from the previous spring and summer field sessions.

1.9.3 Terrestrial Wildlife

The wildlife team (Gebauer and Associates) arrived on site the week of May 19 to initiate the 2008 wildlife program. A number of studies were undertaken to establish baseline wildlife conditions within the Kiggavik study area. The surveys are important in identifying potential issues related to proposed mine development and in establishing baseline data for long-term monitoring purposes.

Caribou, Muskox and Predatory Mammals

Aerial surveys of the Regional Study Area (RSA) were conducted on five occasions between May and October 2008. The primary purpose of the surveys was to determine the number, distribution and group composition of Caribou and Muskox, but information (e.g., den sites, observations etc.) on predatory mammals such as Grizzly Bear, Wolverine and Wolf was also collected. Surveys were flown by fixed-wing aircraft along

14 predetermined transects spaced 10 km apart throughout the RSA. All animals within 500 m of the aircraft (i.e., 1 km transect width) were counted and GPS locations were recorded. Three aerial surveys of the Local Study Area (LSA) were also flown along 18 transects spaced 1.5 km apart.

Ground-based 'Height-of-Land' surveys were conducted to determine the distribution of wildlife (particularly caribou) in the LSA. At each station, wildlife observed within a 15 minute period at any distance were recorded.

Raptors

A survey of raptor nests was conducted by helicopter and by foot along the proposed northern all-weather route and within the LSA. The purpose of the survey was to record all active nests, identify suitable nesting habitats, and investigate potential constraints to mine development.

Waterbirds

Nest surveys were conducted along shorelines of all waterbodies within 200 m of proposed mine infrastructure (did not include the proposed all-weather road). The survey involved two observers walking along the edge of shorelines within the study area and recording all active nests and waterbirds present. The primary purpose of the surveys was to identify waterbird nesting aggregations and potential constraints to mine development.

Upland Breeding Birds

PRISM (Program for Regional and International Shorebird Monitoring) plots were established and surveyed within the LSA to determine the abundance and diversity of upland breeding birds. Twenty-five plots were established in close proximity to mine facilities while an additional 20 plots were established in a control area where the effects from mine-related activities would not be apparent. Plots consisted of a 400x300 m area surveyed by two observers spaced 25 m apart.

Upland breeding bird abundance and diversity was also determined along the proposed northern all-weather road along ten 3 km long transects centred on the proposed road. Each of the 10 transects was surveyed on three occasions in 2008.

Wildlife Habitat

Wildlife habitats within the 9,060 km^2 RSA were mapped using an Ecological Land Classification (ELC) methodology. The methodology involves analysis of spectral imagery leading to identification of habitat classes. The ELC work provides information on the distribution of habitat classes across the landscape and is necessary for

conducting wildlife habitat suitability ratings for key wildlife valued ecosystem components (VECs).

1.9.4 Soil and Vegetation

Permanent sample plots (PSPs) were established to measure baseline radionuclide and trace metal concentrations in soil and vegetation. Ten plots were established in 2008, six of which were used in a previous 2007 study. Five of the PSPs were located within the Kiggavik area and five plots were located within the Sissons area. Plant groups collected for analysis included sedges, foliose lichens and berries. The selected plant groups are important forage for ungulates, small mammals, ptarmigan, waterbirds, and upland breeding birds. Soil samples were collected from the same area that vegetation was collected. Samples were sent to the ALS Laboratory Group (Vancouver, BC) for analysis of trace metal concentrations and to Saskatchewan Research Council (SRC) in Saskatoon, SK for determination of radionuclide concentrations.

1.9.5 Alpha Emissions

Three site alpha dosimeters were installed in 2008; one in Baker Lake, one at Kiggavik and one at Sissons. These instruments included an air sampler, an electronic flow meter for the continuous measurement of the sampling volume of air and a head for the integrated measurement of alpha emissions of short life daughter products of radon 222 and 220 and long life products of uranium and thorium. Twenty-six track etch cups for environmental radon gas measurements were also installed in the Kiggavik and Sissons area.

1.9.6 Archaeology

The archaeological field survey was conducted over the course of 6 days from July 22 – 27, 2008. The team included two Golder employees and a local archaeological assistant from the Baker Lake community.

The survey focused on the proposed all season road extending from Kiggavik to Baker Lake, as well as the proposed haul road to Andrew Lake. Over the six days of survey, 35 new sites were identified and nine previously recorded sites were revisited. Of the newly recorded sites, the most common feature was the hunting cache. Tent rings/squares were the next most common feature. Hearths/firepits, hunting blinds, inuksuit, qarmats and two sets of kayak stands were also recorded. Lastly, lithic scatter sites were identified, which consisted primarily of flakes from stone tool manufacture. One spear point and one biface knife were collected from these sites.

Although the exact age of most of these sites is unknown, it was evident that several were used recently or at least during the historic period.

During September, the Heritage team completed a one page non-technical summary of field investigations. The summary was submitted to the Nunavut Government Department of Culture, Language, Elders and Youth in compliance with the conditions of the Nunavut Archaeologist Permit held by Golder for the Kiggavik Project.

There were no known impacts to heritage resources as a result of the 2008 Project field activities.

1.9.7 Marine Studies

Marine studies were conducted in 2008 in the Baker Lake and Chesterfield Inlet areas by Nunami Jacques Whitford staff and local assistants from the communities.

Aerial marine mammal surveys were conducted from September 10 to September 15, 2008. Weather conditions were favourable, and a total of five days were spent surveying Chesterfield Inlet and the nearshore area between Chesterfield Inlet and Rankin Inlet.

Baker Lake aquatic baseline studies were conducted from September 18 to September 21, 2008. High winds resulted in limited opportunities to access field sites. Nunami Jacques Whitford staff stayed an additional 2 days to complete surveys at 2 potential dock sites on the south side of the lake. Five potential dock sites were surveyed for the following parameters: chemical analysis of sediment, benthic invertebrate analysis of sediment, chemical analysis of water, water column profile, bathymetry and foreshore characterization.

Due to weather and limited access to sites, fish surveys (gill nets, longline) were limited. Gill nets were deployed at three of the five sites and long lines were deployed at two of the five sites. High winds and rough conditions on the lake resulted in the loss of one gill net.

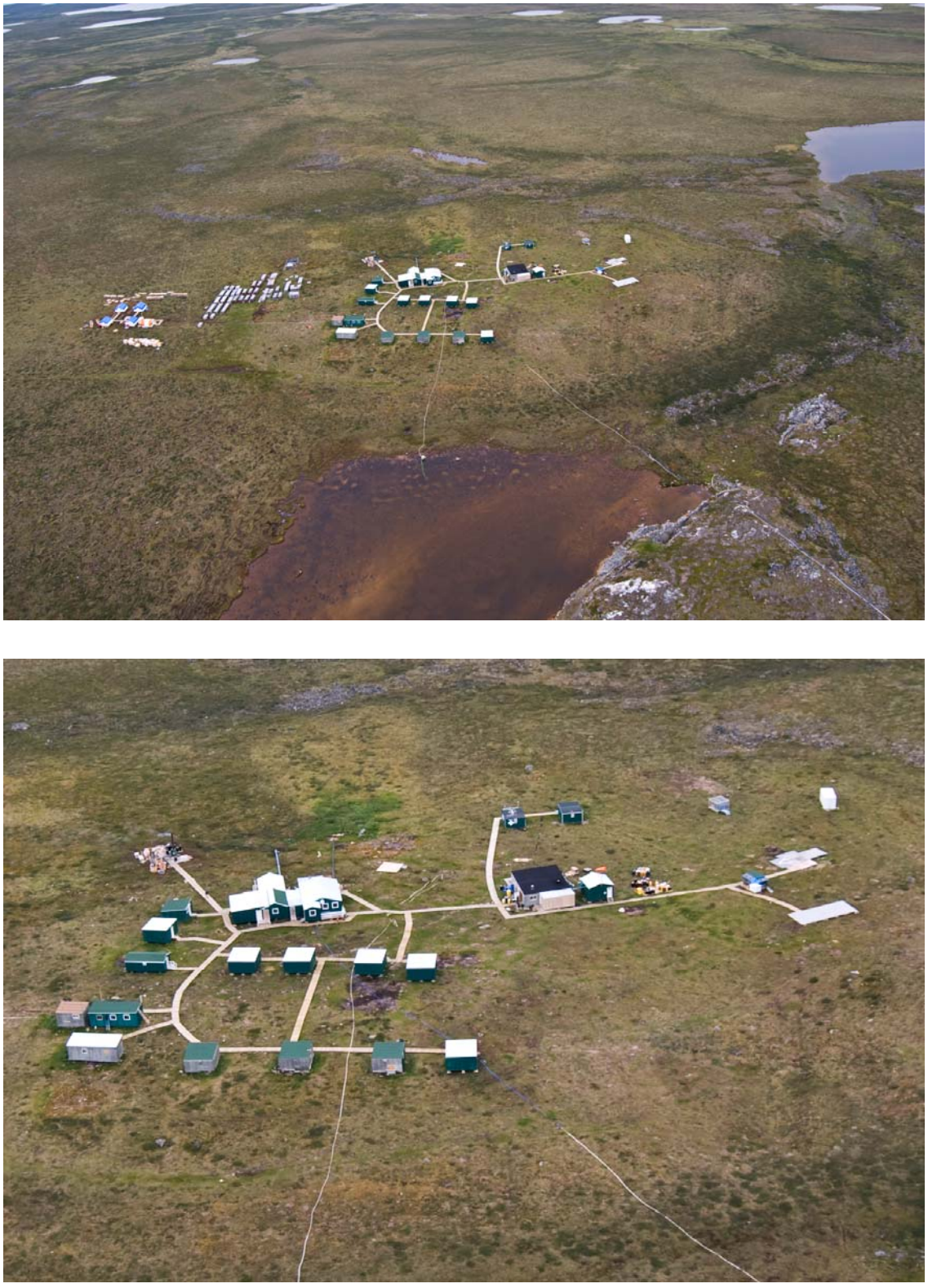

Figure 1.1 Kiggavik Camp Photos, August 2008

Figure 1.2 Winterized Kiggavik Camp, September 2008

Figure 1.3 Winterized Kiggavik Lay-Down Area, September 2008

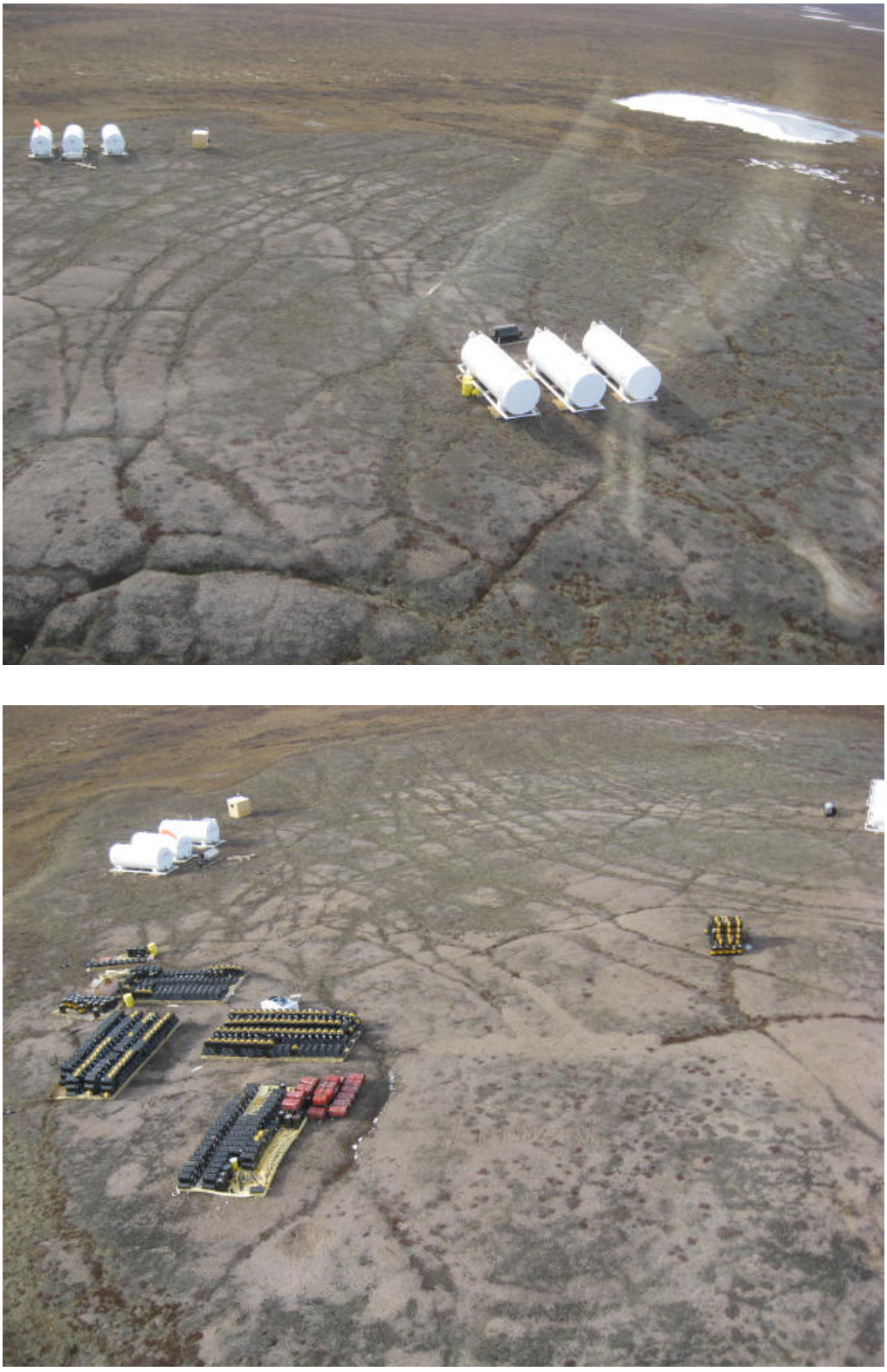

Figure 1.4 Fuel Cache at Esker, September 2008

2 SUMMARY OF PLANNED ACTIVITIES FOR THE 2009 PROGRAM

2.1 General

Activities planned for 2009 field program are relatively similar to the activities conducted during the 2008 program; consisting primarily of diamond drilling and environmental baseline studies to improve the understanding of the Project site and the known mineral deposits. The intent is to gather information required to determine whether these deposits can be safely and economically extracted and processed, while protecting the environment. A limited exploration program will also be carried out throughout the lease areas to identify potential for additional mineral deposits and to further evaluate known potential areas.

It is expected that the drilling and environment crews will be mobilized to the site during May and June 2009. 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 will be conducted out of the Kiggavik camp and will be supported by helicopter services and the Baker Lake office. The maximum number of people at the camp is estimated to be 59 in 2009.

2.2 Camp Expansion

There is no camp expansion planned for 2009. Minor renovations to existing buildings may occur as required, and AREVA plans to expand the existing radioactive storage compound.

2.3 Fuel Cache

The usage of the bulk fuel tank storage systems is planned for 2009. However drums will continue to be used to supplement tank capacity.

The bulk fuel tank storage system includes eight (8) double-walled steel EnviroTanks, each with a capacity of 50,000-litres. Six (6) tanks were installed by an approved installer and in accordance with Canadian Council for Ministers of the Environment (CCME) – Environment Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products during 2008 at an esker on the Kiggavik lease, east of the Kiggavik camp (see Figure 1.4). The tanks have been registered with Environment Canada. Three (3) of the tanks are for the storage of Jet-B fuel and three (3) tanks are for the storage of diesel fuel. It is planned to transport two (2) more tanks to the same esker for diesel fuel requirements during the winter 2009 supply haul. These two tanks will then be installed and set up during the field program.

AREVA will comply with Environment Canada's Storage Tank Systems for Petroleum Products and Allied Petroleum Product Regulations and the Canadian Council for

Ministers of the Environment (CCME) – Environment Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products. Procedures and work instructions for tank operation are under development to support compliance with these regulations.

2.4 Geophysics

The proposed 2009 exploration program includes completion of the airborne gravity survey (started in 2007).

Additional ground penetration radar investigations (i.e., potential mill site, potential Thelon Bridge area, etc…) will be conducted.

2.5 Drilling, Sampling and Testing

Drilling at Kiggavik

- The primary objective of the drilling campaign will be to collect geotechnical data
- Diamond drilling will focus on the existing Main Zone and Center Zone deposits
- Diamond drilling will include a total of 8 to 15 drill holes
- Total meterage is expected to range between 1,500m and 2,500m
- The drill hole size will be mainly NQ
- Core orientation will be conducted using the Ace core orientation system, or equivalent
- Triple tube drilling will be conducted where possible to enhance sample quality for geotechnical purposes
- Holes will be inclined (between 48^{o} and 58^{o})
- Hole length is expected to range between 130m and 300m
- Packer tests will be conducted on some holes below the permafrost. Water samples will be also collected using packer systems and swabbing tools.

Drilling at Andrew Lake

- The primary objective of the drilling campaign will be to collect geotechnical data
- Diamond drilling will focus on the existing Andrew Lake deposit, southwest of Kiggavik
- Diamond drilling will include a total of 3 to 6 drill holes
- Total meterage is expected to range between 1,000m and 2,000m
- The drill hole size will be mainly NQ
- Core orientation will be conducted using the Ace core orientation system, or equivalent
- Triple tube drilling will be conducted where possible to enhance sample quality for geotechnical purposes
- Holes will be inclined (between 48^{o} and 58^{o})

- Hole length is expected to range between 300m and 370m
- Packer tests will be conducted on some holes below the permafrost. Water samples will be also collected using packer systems and swabbing tools.

Drilling at End Grid

- The objectives of the drilling campaign will be to collect resources and geotechnical data
- Diamond drilling will focus on the existing End Grid deposit, southwest of Kiggavik.
- Diamond drilling will include a total of 9 to 15 drill holes
- Total meterage is expected to range between 3,500 and 5,000m.
- The drill hole size will be mainly NQ
- Core orientation will be conducted using the Ace core orientation system, or equivalent
- Triple tube drilling will be conducted where possible to enhance sample quality for geotechnical purposes
- Holes will be inclined (between 80^{o} and 70^{o})
- Hole length is expected to range between 410m and 480m
- Packer tests will be conducted on some holes below the permafrost. Water samples will be also collected using packer systems and swabbing tools.
- An amendment has been approved by the Nunavut Water Board to allow for drilling to occur within 30 meters of the high water mark of streams that enter End Grid Lake.

Bong and Granite Areas

No drilling is planned at Bong or Granite during 2009.

2.6 Thermistor Installation and Monitoring

Additional deep and shallow thermistors will be installed at Kiggavik and Sissons sites to confirm the 2007 and 2008 findings.

2.7 Environment, Health and Safety Monitoring

The 2009 Environmental, Health and Safety (EH&S) monitoring program will continue to be conducted by AREVA staff with some safety oversight provided by contractors. Wildlife monitoring 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, and the Abandonment and Restoration Plan. These Plans have been designed

and implemented to ensure compliance with regulatory conditions and internal AREVA requirements.

2.8 Environmental Baseline Work

The 2009 environmental baseline work will focus on the collection of wildlife, aquatic, marine and terrestrial baseline data to confirm the 2007 and 2008 findings. The archaeological program will be continued.

At the request of the Government of Nunavut – Department of Environment (GN-DoE), it is proposed to discontinue the aerial surveys of the local study area and regional study area in 2009. Instead, resources (financial and manpower) would be made available to support government-lead caribou population studies. Details of these studies need to be agreed with government representatives prior to the 2009 field season.

3 OPERATIONAL PLANS

Prior to initiation of the 2008 field season, seven Environmental Management Plans, originally prepared in 2007, were updated and submitted to the regulatory agencies to aid in developing best management practices and procedures to mitigate any potential adverse environmental impacts. These Plans also ensure compliance with regulatory approval conditions and internal AREVA requirements. It is AREVA's intention to operate in accordance with commitments made in the Plans; however, such Plans are living documents and lessons learned during the field season and AREVA's commitment to continual improvement warranted some revision of these Plans prior to the 2009 season. These revised Plans have been included with the submission of this Annual Report (refer to Appendix A).

The seven plans are as follows and are discussed below:

- Spill Contingency Plan
- Radiation Protection Plan
- Waste Management Plan
- Wildlife Mitigation and Monitoring Plan
- Abandonment and Restoration Plan
- Noise Abatement
- Uranium Exploration Plan

3.1 Spill Contingency Plan

In accordance with existing legislation and AREVA's Environmental Policy, a Spill Contingency Plan exists for the Kiggavik Project. The objectives of the Plan are to:

- identify the potential for and the appropriate response to spills at the Project;
- have procedures to follow to prevent or mitigate adverse environmental effects through effective and efficient response;
- identify personnel and their responsibilities;
- identify emergency contacts; and,
- describe reporting requirements.

To effectively implement this Plan all site staff and contractors are required to review the Plan upon arrival at site, including the location of Material Safety Data Sheets, the location of spill kits and spill response supplies and tools. Training for all site staff consists of how to identify potential or existing leaks or spills, where they are most likely to occur and instruction on how to effectively use spill response supplies and tools. Additional training is provided as necessary.

Spill prevention is addressed by the implementation of secondary containment and spill kits at locations identified to be potential hazards, daily inspections are carried out at all storage locations and MSDS sheets are readily available. Spill response is reviewed with all site staff and contractors and site supervisors and designates are aware of spill reporting procedures.

The Plan was implemented three times during the 2008 field season as a result of one unplanned release of drill water and two releases of radiologically contaminated drill cuttings onto land. These incidents and the associated responses are discussed in Section 12.

A revised Spill Contingency Plan has been submitted with this Report to reflect opportunities for improvement.

3.2 Radiation Protection Plan

The Radiation Protection Plan is designed to meet the requirements of the applicable Nunavut Occupational Health and Safety Regulations, Saskatchewan Mineral Exploration best practices, the Canadian Nuclear Safety Commission (CNSC) Regulations (although current activities are not regulated by CNSC) and the AREVA Integrated Quality Management System (IQMS). The administrative and program elements are as follows:

Administrative Elements

- Program documentation
- Training
- Designation of Occupational Workers
- Dose limits and dose levels
- Obligations of Occupational Workers
- Pregnant workers

Program Elements

- Exposure as Low as Reasonably Achievable (ALARA)
- Radiological monitoring
- Dosimetry monitoring
- Code of Practice
- Management of radioactive materials
- Shipping of radioactive materials
- Site abandonment and restoration
- Emergency response

All employees and contractors receive appropriate radiation protection training prior to beginning work at the Project site to ensure worker safety and protection of the environment. Any personnel involved with the shipment of radioactive materials are required to receive training and certification in the Transportation of Dangerous Goods (TDG).

The Plan is implemented by the development and implementation of a routine monitoring schedule carried out by the EH&S Group; dosimetry monitoring to determine worker exposure; proper management of radioisotopes (cesium-137 used for testing the operation of down hole probes); proper shipping and receiving of radioactive material, the proper storage and collection of radioactive materials and the development of a corporate emergency response plan.

A more detailed description and results of the Plan are discussed in Section 5. A revised Radiation Protection Plan has been submitted with this Report to reflect opportunities for improvement.

3.3 Waste Management Plan

In accordance with AREVA's Environmental Policy, a Waste Management Plan has been developed and implemented to adequately address any concerns regarding waste and to mitigate any potential adverse environmental impacts. AREVA is committed to ensuring that all wastes generated at the Kiggavik Project site are collected, stored, transported and disposed of in a safe, efficient and compliant manner.

In the development of this Plan, potential waste streams were identified, followed by identification of a treatment strategy and disposal plan. All site staff and contractors review this Plan and are trained in the aspects required to effectively adhere to the Plan (i.e. proper identification of waste, proper storage methods, proper handling and transport methods).

All food, paper and non-treated wood waste are incinerated in an approved incinerator. All other wastes are properly sorted and stored for future handling.

The Waste Management Plan was updated in October 2007 and implemented during the 2008 field season. AREVA is committed to the removal of all non-incinerating waste off-site to approved facilities. Due to the limited number of approved facilities for recyclable or hazardous waste dangerous goods in the immediate area, AREVA ensures that all materials are properly sorted, packaged and stored on-site until approved facilities or handlers can be identified and contracted.

Internal Waste Disposal forms have been implemented for any domestic waste requiring transport from site to the Baker Lake landfill. Materials transported during 2008 are shown in Table 3.1.

Table 3.1 Kiggavik Site Waste Manifest 2008

Date	Waste Material	Description / Quantity	Transported To
18-Jun-08	untreated wood	1600 lbs	Baker Lake dump
20-Jun-08	untreated wood	1400 lbs	Baker Lake dump
30-Jun-08	untreated wood	1400 lbs	Baker Lake dump
25-Jul-08	ashes	3 drums	Baker Lake dump
26-Jul-08	ashes	9 drums	Baker Lake dump
12-Sep-08	untreated wood	1800 lbs	Baker Lake dump
15-Sep-08	ashes	5 drums	Baker Lake dump
18-Sep-08	untreated wood	1010 lbs	Baker Lake dump
19-Sep-08	used oil	615 L	Re-used in Baker Lake
21-Sep-08	used oil	615 L	Re-used in Baker Lake

As required, an inventory of all waste and material remaining on site was recorded upon seasonal shutdown and is summarized in Table 3.2.

All radiologically contaminated drill cuttings are collected and stored in the radioactive storage area for future handling.

The Waste Management Plan is frequently reviewed and revised upon the identification of new waste streams, new handling methods or requirements and improved logistics. The current Waste Management Plan has been submitted with this Report.

Table 3.2 Kiggavik Site End of Season Inventory 2008

Type of Waste/Product	Quantity	Storage Method
Waste oil and fuel	6 – 205 litre bung drums	Shipped back to Baker Lake – used by BLCS in their furnaces
Incinerator Ashes	4 – 205 litre ring top drums from 2007 13 – 205 litre ring top drums from 2008	All taken and emptied at Baker Lake land fill. Empty drums returned to Kiggavik.
Empty metal drums	171– 205 litre drums empty Jet and Diesel fuel	Stacked and stored (35 at camp, 136 at fuel esker) to be shipped during winter back-haul
Scrap metal	6 - Wooden crates 4x4x4 with lids	Located beside incinerator until can be shipped off site for handling
Engine filters Oil and Fuel	2 – 205 litre ring top drum	In sea-can type storage container until can be shipped off site for handling
Oil cans Empty	2 – 205 litre ring top drum	In sea-can type storage container until can be shipped off site for handling
Oil contaminated rags	2 – 205 litre ring top drum	In sea-can type storage container

Type of Waste/Product	Quantity	Storage Method
		until can be shipped off site for handling
Empty/used paint cans	1 – 205 litre ring top drum	In sea-can type storage container until can be shipped off site for handling
Generator Oil	3 – 20 litre pails 2 – 10 litre pails 8 – 1 litre jugs	In secondary containment in generator building
Diesel contaminated soil and rags from spill clean-up	1 – overpack drum	In sea-can type storage container until can be shipped off site for handling
Calcium Chloride and cement bags	65 bags $CaCl_2$ 52 bags of cement	In sea-can type storage container for use in 2009
Jet Fuel	2 – 205 litre drums	In secondary containment at fuel cache
Diesel Fuel	725 – 205 litre drums	In secondary containment at fuel cache
Propane	42 – 100 lb bottle	Upright in a locked fence compound
Empty propane	12 – 100 lb bottle	Stored beside propane compound to be shipped back during winter haul.
Aerosol cans – empty and punctured	1 – 205 litre ring top drum	In sea-can type storage container until can be shipped off site for handling
Boart Longyear Supplies	12 – 1 litre Engine Oil 3 – 20 litre Hydraulic Oil 12 – Grease	In sea-can type storage container for use in 2009

It is expected that during the winter fuel haul to the Kiggavik site (early 2009) Peter's Expediting will backhaul, to a storage location for re-use in Baker Lake, approximately 171 empty metal drums and four (4) rock bags containing cement and calcium chloride, which have been ruined by moisture.

AREVA is currently in the process of seeking registration with the Government of Nunavut – Department of Environment for the storage and shipping of hazardous materials.

Kiggavik Incinerator

3.4 Abandonment and Restoration Plan

An Abandonment and Restoration Plan has been developed to address conditions of permits, regulations and industry standards throughout the operational season, at seasonal shut-down and at final closure of the site. The 2008 implementation of the Plan is discussed in Section 9. This Plan is frequently reviewed and revised to reflect the expansion of infrastructure, changing field programs and the identification of improved reclamation practices. The current Abandonment and Restoration Plan has been submitted with this Report.

The objectives of the Plan are to:

- Protect human health
- Reduce or eliminate environmental effects
- Re-establish conditions which permit the land to return to a similar pre-exploration land use
- Establish physical and chemical stability of disturbed areas

3.4.1 Abandonment

As required by the Abandonment and Restoration Plan the following activities were conducted for the seasonal shutdown of the Kiggavik camp:

- All equipment has been stored in secure buildings or containers
- Plywood has been nailed over windows and doors have been secured to prevent inadvertent opening

- Pumps and hoses have been drained and dismantled
- Full inventory of chemicals, products and wastes remaining on site has been conducted
- Final inspection of all storage areas and secondary containment
- Removal of chemicals or storage in secure buildings
- A final inspection of drill sites, including gamma surveys and the removal of any fuel or radiologically contaminated soil
- Drill rigs have been dismantled

Photos are shown in Figures 1.3 and 1.4.

3.4.2 Restoration

AREVA intends to implement progressive restoration practices and incorporate new abandonment and/or reclamation methods and procedures, when applicable. The current Plan has been implemented at all drill sites operated during the field season to establish chemical stability. All drill sites from the current year's field program are inspected for fuel stained soil and undergo a gamma survey for radioactive contamination. Contaminated soil or cuttings are collected in appropriate containers and stored in the long-term core storage area for future handling, which may include transfer to an operating mine site.

Drill sites must be remediated to the extent that gamma dose at a height of 1 m from surface is less than 1 µSv/h. To the greatest extent possible, all residual radioactive materials accumulated during drilling are disposed of down the drill hole. Where this is not practicable, as in most cases, radioactive material is collected, appropriately packaged and stored in the existing core storage areas. Gamma radiation levels at 1 m from the surface of the core storage area should be reduced as much as practical with the target of less than 1 µSv/h and in no instances exceed 2.5 µSv/h. If necessary, residual radioactive material will be transported to the McClean Lake Operation for storage and disposal.

Challenges surrounding physical reclamation of disturbed surfaces include lack of local knowledge or available information. To minimize the affected footprint and therefore the amount of required physical reclamation there is a focused effort on proper planning of infrastructure placement and drill sites. It is AREVA's intention to reclaim disturbed sites in an acceptable manner, when adequate information becomes available. Proper reclamation techniques are currently being investigated and will be implemented under the direction and approval of experienced consultants, community members and regulatory agencies. Restoration work will be completed prior to the expiry of the land use licence.

3.5 Noise Abatement Plan

A Noise Abatement Plan was developed to mitigate the effects from noise generated during camp set-up, camp operation, winter road use and drilling activities. Noise controls and abatement serve a combination of environmental and occupational health and safety purposes. The main focus of this Plan is the control of environmental noise for the protection of wildlife.

Implementation of this Plan ensures that drill rigs and vehicles are equipped with mufflers and/or silencers and is subject to commitments made in the Wildlife Mitigation and Monitoring Plan regarding minimum required flying altitudes and the take-off and landing of aircraft.

This Plan is reviewed with all site staff and contractors, as well as head office contract administrators to ensure all contractors operating drill rigs, vehicles or aircraft are aware of the requirements of this Plan.

Frequent review allows for revision to occur with the expansion of infrastructure, changing field programs and the identification of improved practices. The current Noise Abatement Plan has been submitted with this Report.

3.6 Wildlife Mitigation and Monitoring Plan

A Wildlife Mitigation and Monitoring Plan has been developed to address wildlife protection and monitoring objectives. Mitigation and monitoring plans are based on recommendations made by the Government of Nunavut, Environment Canada and the Beverly and Qamanirjuaq Caribou Management Board; permit and lease conditions from NIRB, KIA, INAC and the NWB; and the experience and knowledge obtained from wildlife effects monitoring programs at the BHP Billiton Ekati Diamond Mine, Diavik Diamond Mine and the De Beers Snap Lake Project. The Plan is designed to protect wildlife from Project activities, increase the current understanding of wildlife interactions with human development and to determine the effectiveness of mitigation measures.

The revised 2009 Plan has evolved with lessons learned during the 2007 and 2008 field seasons, discussions with regulators, and community concerns. Evolution of this Plan is evidenced most notably in the movement away from aerial survey work. Daily low-level aerial surveys were once recommended but are now used less as AREVA works with the GN-DoE to collect meaningful caribou population data while reducing aerial disturbance. The 2009 Plan was also updated to more closely reflect the content and function of an operational plan.

3.6.1 Summary of 2008 Monitoring Activities and Results

In 2008, daily aerial reconnaissance surveys to monitor caribou within the Project area (mineral leases) were not conducted for monitoring purposes. These surveys were

replaced by stationary ground observations along with the use of DoE satellite caribou collar data to monitor locations of caribou. Daily reconnaissance surveys were conducted during regular air transport of field personnel. Site staff reported any wildlife sightings in the Wildlife Logbook (refer to Table 3.4 appended to this section). Observations guided implementation of applicable mitigation measures.

AREVA hired independent wildlife monitors and made efforts to have one on site at all times. Wildlife monitor observations and observations during flights resulted in less than 450 recorded caribou during the drilling period (Table 3.3). The largest group of approximately 200 caribou was observed north of Thom Lake, approximately 50 km from the Kiggavik site, on June 30, 2008. There were 24 observations of muskoxen ranging in group size from one to 27 individuals. There were also five wolf, 11 fox and a single wolverine sighting. There were no known reports of satellite-collared caribou near the Project site.

Table 3.3 Results of 2008 caribou monitoring program at Kiggavik (orange indicates Project-related disturbance)

Date	Observation	Comments
June 2, 2008	7 bulls and 2 cows at 1km from camp	Feeding and Walking
June 5, 2008	5 caribou at 1km	Eating and walking
	2 caribou at 2.5km	Walking and Eating
June 6, 2008	5 caribou near camp	Feeding and Resting
June 7, 2008	2 bulls at 1km from camp	Feeding and Walking
June 8, 2008	2 caribou at 2km from camp	Walking
June 15, 2008	3 caribou at 4.5km from camp	
June 17, 2008	caribou walking NE	Bedded, Eating and Walking
	6 caribou NE of Pointer Lake	Eating and walking
	7 caribou NE of Pointer Lake	Eating and Walking
June 19, 2008	1 caribou at 4km	
	3 bulls at Willow Lake	
	2 caribou at 4.5km	
	5 caribou at 4.5km from camp	Grazing
June 20, 2008	1 cow and juvenile at Lower lake	Walking
June 21, 2008	1 bull at 2km of Fuel Esker	Feeding - Helicopter Disturbance - Standing
June 22, 2008	1 bull at 3km from camp	Feeding - Helicopter Disturbance - Standing
June 24, 2008	1 bull and 1 cow at Fox Lake	Grazing
	2 caribou at 4.5km from camp	Grazing
June 25, 2008	1 caribou at Andrew Lake	Feeding - Helicopter Disturbance (300m) - Feeding
June 26, 2008	1 caribou at 600m from camp	walking
June 28, 2008	1 cow and juvenile at 1km from camp	Feeding
	3 caribou at 1km from camp	walking
June 29, 2008	1 bull at 1km from camp	Feeding and Walking
	1 cow and juvenile	
June 30, 2008	200 caribou north of Tom Lake	
	5 bulls south of camp	resting
July 1, 2008	1 caribou 600m from camp	Walking
	22 caribou 1.5km from camp	Feeding and Walking

Date	Observation	Comments
	21 caribou 2.5km from camp	Feeding
	1 caribou 10-15km from camp	Walking
July 2, 2008	1 caribou near Andrew Lake	Feeding
July 5, 2008	15 caribou west of camp	Feeding and walking
	1 bull 2km from AND-08-01	
	5 caribou 5km from camp	feeding
July 8, 2008	15 caribou 100m from camp	Walking
	4 caribou at 10.5km from camp	Standing, Feeding and walking
July 22, 2008	1 caribou in camp	trotting
July 23, 2008	1 caribou in camp	trotting
July 24, 2008	1 caribou in camp	walking
	1 caribou 50m from camp	standing
July 25, 2008	1 caribou 50m from camp	walking
	1 caribou 50m from camp	walking
July 26, 2008	1 caribou 150m from camp	walking
July 27, 2008	2 caribou east of camp	walking
	1 caribou west of camp	running
	1 caribou in camp	Walking / Running from Bugs
	2 caribou east of camp	Walking
	2 caribou 50m from camp	walking
August 6, 2008	1 caribou 1km from camp	trotting
August 9, 2008	1 cow and juvenile south of camp	
	1 bull 200m from camp	Running
	1 cow and juvenile south of camp	
August 13, 2008	1 bull	trotting
August 15, 2008	6 caribou 2km from camp	grazing
August 17, 2008	1 cow and juvenile east of camp	Walking
	6 caribou 200m from camp	grazing
	caribou at camp landing pad	Walking - Helicopter Disturbance (30m) - Running; Pilot did not see caribou flying in but later noticed it running near the helipad
	1 bull and 2 cows near camp	Running and Walking
August 18, 2008	6 caribou 800m from camp	Walking
	2 bulls and 2 cows south of camp	Walking
August 23, 2008	20 caribou 3km from camp	walking

3.6.2 Summary of Mitigation Actions

Altitude restrictions were in place for all helicopter flights as per AREVA's Noise Abatement Plan and Wildlife Mitigation and Monitoring Plan. Variable weather conditions in early June and fog in mid and late June resulted in many low-level flights. In July and August, ceilings were generally high allowing altitude restrictions to be maintained most days. During September, low ceilings required lower altitudes to be flown for the most of the flights. Weather also grounded the helicopter on some days.

There were no wildlife incidents associated with the Kiggavik Project in 2008. The only wildlife disturbances recorded were the result of helicopter activity. In all four instances

the disturbance involved a single caribou. AREVA intends to increase pilot awareness by improving the on-site review of required mitigation and communication of monitoring results.

The Plan also outlines mitigation measures to be taken when conducting aerial geophysical surveys; however, there were no geophysical surveys conducted in 2008.

3.7 Uranium Exploration Plan

The Uranium Exploration Plan is designed to meet the requirements of the Water License issued by the Nunavut Water Board (2BE-KIG0708) and the Saskatchewan Environment Mineral Exploration Guidelines and Best Management Practices and the Canadian Nuclear Safety Commission (CNSC) Regulations (although CNSC does not regulate exploration activities).

The Plan discusses activities related to uranium exploration including:

- Training requirements
- Drilling practices
- Core storage and logging
- Radioisotopes
- Spills
- Shipping radioactive material
- Site abandonment and restoration

On August 16 and September 18, shipments of core samples (low specific activity) were sent via air from Kiggavik to Points North, Saskatchewan and by truck from Points North to Saskatoon for eventual shipment to a laboratory in France. Shipper's Declaration for Dangerous Goods were completed and filed by appropriately trained AREVA staff.

The Uranium Exploration Plan is reviewed on an annual basis and revised if necessary; the current version has been accepted by the Nunavut Water Board via Part F(1) of the licence 2BE-KIG0812 issued May 12, 2008.

Table 3.4 Wildlife Observation Log Book – 2008

Date	Time	Species	Age	Sex	#	Disturbance	Cause of Disturbance	Behaviour Before Disturbance	Behaviour After Disturbance	Actions Taken to Avoid Disturbance	Distance from Disturbance in meters	Physical Location	Other Comments
6/2/2008	19:00	Caribou	unknown	Male Female	7 2	No	NA - No Disturbance	Feeding and Walking		not applicable		1km south of camp	
6/3/2008	21:00	Sandhill Crane	unknown	unknown		No	NA - No Disturbance			not applicable		600m south of camp	Nest with 1 egg
6/3/2008	21:00	Sandhill Crane	unknown	unknown	1	No	NA - No Disturbance			not applicable		600 m South of camp	Nest with 1 egg
6/3/2008	21:00	Parasitic Jaeger	unknown	unknown	5	No	NA - No Disturbance			not applicable		2km south of camp	
6/4/2008	11:00	Wolf	unknown	unknown	6	No	NA - No Disturbance	Walking and Running		not applicable		1.5 km east of camp	
6/4/2008	12:00	White Crowned Sparrow	unknown	unknown	1	No	NA - No Disturbance	Foraging		not applicable		outside kitchen	
6/4/2008	12:00	Herring Gull	unknown	unknown	1	No	NA - No Disturbance			not applicable		outside kitchen	
6/5/2008	12:00	Caribou	unknown	unknown	5	No	NA - No Disturbance	Eating and walking		not applicable		1 km	
6/5/2008	14:00	Canada Geese	unknown	unknown	2	No	NA - No Disturbance	Flying		not applicable		100 west of camp	
6/5/2008	21:00	Caribou	unknown	unknown	2	No	NA - No Disturbance	Walking and Eating		not applicable		2.5 km	
6/6/2008	9:00	Speckle Belly Geese	unknown	unknown	3	No	NA - No Disturbance	Flying		not applicable		Camp	
6/6/2008	14:00	Raven	unknown	unknown	1	No	NA - No Disturbance	Flying		not applicable		Sissons	

Date	Time	Species	Age	Sex	#	Disturbance	Cause of Disturbance	Behaviour Before Disturbance	Behaviour After Disturbance	Actions Taken to Avoid Disturbance	Distance from Disturbance in meters	Physical Location	Other Comments
6/6/2008	14:00	Geese	unknown	unknown	50	No	NA - No Disturbance	Flying		not applicable		Sissons	
6/6/2008	15:30	Sandhill Crane	unknown	unknown	1	No	NA - No Disturbance	Eating and walking		not applicable		Sissons	
6/6/2008	15:30	Short-tailed Weasel	unknown	unknown	1	No	NA - No Disturbance			not applicable		Sissons	
6/6/2008	16:00	Caribou	unknown	unknown	5	No	NA - No Disturbance	Feeding and Resting		not applicable		Camp	
6/6/2008	21:00	Muskox	unknown	Male	1	No	NA - No Disturbance			not applicable		4 km from camp	
6/7/2008	10:30	Caribou	unknown	Male	2	No	NA - No Disturbance	Feeding and Walking		not applicable		1 km South West of Camp	
6/7/2008	13:30	Sandhill Crane	unknown	unknown	2	No	NA - No Disturbance	Eating and walking		not applicable		300 m NE of camp	
6/8/2008	17:30	Caribou	unknown	unknown	2	No	NA - No Disturbance	Walking		not applicable		2 km north of camp	
6/10/2008	7:30	Geese	unknown	unknown	32	No	NA - No Disturbance	Standing		not applicable		200 m west of camp	
6/10/2008	7:39	muskox	unknown	unknown	2	No	NA - No Disturbance	Grazing		not applicable		2 km north of camp	
6/10/2008	10:00	Pintails	unknown	Male Female	4 4	No	NA - No Disturbance	Swimming		not applicable		Pond beside camp	
6/10/2008	13:00	Geese	unknown	unknown	2	No	NA - No Disturbance	Standing		not applicable		15 ft from kitchen	
6/11/2008	14:00	muskox	unknown	unknown	4	No	NA - No Disturbance	Grazing		not applicable		2 km north of esker	
6/12/2008	2:00	Fox	unknown	unknown	1	No	NA - No Disturbance	Running		not applicable		drill site	

Date	Time	Species	Age	Sex	#	Disturbance	Cause of Disturbance	Behaviour Before Disturbance	Behaviour After Disturbance	Actions Taken to Avoid Disturbance	Distance from Disturbance in meters	Physical Location	Other Comments
6/13/2008	16:00	Sandhill Crane	unknown	unknown	1	No	NA - No Disturbance	Walking and Eating		not applicable		50-100 m east of core shack	
6/13/2008		muskox	unknown	unknown	13	No	NA - No Disturbance	Resting and Feeding		not applicable		4 miles NW of camp	
6/14/2008	6:45	Geese	unknown	Male Female	1 1	No	NA - No Disturbance	Feeding		not applicable		By kitchen	
6/15/2008	2:00	Fox	unknown	unknown	1	No	NA - No Disturbance	walking		not applicable		By MZ-08-02	
6/15/2008	8:00	Crane	unknown	unknown	1	No	NA - No Disturbance	walking		not applicable		20m from office	
6/15/2008		Caribou	unknown	unknown	3	No	NA - No Disturbance			not applicable		3 miles west of camp	
6/17/2008	5:45	Fox	unknown	unknown		No	NA - No Disturbance	Sneaking around drill		not applicable		300 m e of camp	
6/17/2008	9:30	Caribou	unknown	unknown		No	NA - No Disturbance	Bedded, Eating and Walking		not applicable		walking NE	
6/17/2008	9:30	Caribou	unknown	unknown	6	No	NA - No Disturbance	Eating and walking		not applicable		NE of pointer lake	
6/17/2008	9:30	Sandhill Crane	unknown	unknown	2	No	NA - No Disturbance	Walking		not applicable		NE of pointer lake	
6/17/2008	9:30	Ptarmigan nesting and 6 eggs	unknown	unknown	1	No	NA - No Disturbance			not applicable		NW of Pointer Lake	
6/17/2008	15:30	Caribou	unknown	unknown	7	No	NA - No Disturbance	Eating and Walking		not applicable		NE of Pointer Lake	
6/17/2008		Fox	unknown	unknown	1	No	NA - No Disturbance	Walking		not applicable		outside first aid cabin	

Date	Time	Species	Age	Sex	#	Disturbance	Cause of Disturbance	Behaviour Before Disturbance	Behaviour After Disturbance	Actions Taken to Avoid Disturbance	Distance from Disturbance in meters	Physical Location	Other Comments
6/18/2008	21:00	Muskox	unknown	unknown	6	No	NA - No Disturbance			not applicable		2.5km west of camp	
6/18/2008	21:00	Muskox	unknown	unknown	6	No	NA - No Disturbance			not applicable		2.5km west of camp	
6/19/2008	7:30	Caribou	unknown	unknown	1	No	NA - No Disturbance			not applicable		4 km NW Sissons	
6/19/2008	10:00	Caribou	unknown	male	3	No	NA - No Disturbance			not applicable		Willow Lake	
6/19/2008	15:00	Snow Geese	unknown	unknown	2	No	NA - No Disturbance	Swimming		not applicable		Rock Lake	
6/19/2008	15:30	Caribou	unknown	unknown	2	No	NA - No Disturbance			not applicable		4.5 km NW Sissons	
6/19/2008	17:00	Caribou	unknown	unknown	5	No	NA - No Disturbance	Grazing		not applicable		4.6 km NW of Camp	
6/20/2008	11:00	Caribou	Adult and Juvenile	Female and Unknown	2	No	NA - No Disturbance	Walking		not applicable		Lower Lake	
6/20/2008	12:00	Fox	unknown	unknown	1	No	NA - No Disturbance	Hunting		not applicable		Shack Lake	
6/21/2008	2:30	Sandhill Crane	unknown	unknown	2	No	NA - No Disturbance			not applicable			
6/21/2008	9:30	Caribou	Adult	Male	1	Yes	Inadvertent-Helicopter	Feeding	Standing	look more carefully		2 km west of fuel esker	
6/22/2008	14:00	Lemming	unknown	unknown	1	No	NA - No Disturbance			not applicable		North east of Pointer Lake	
6/22/2008		Muskox	unknown	unknown		No	NA - No Disturbance	Feeding		not applicable			

Date	Time	Species	Age	Sex	#	Disturbance	Cause of Disturbance	Behaviour Before Disturbance	Behaviour After Disturbance	Actions Taken to Avoid Disturbance	Distance from Disturbance in meters	Physical Location	Other Comments
6/22/2008		Caribou	Adult	Male	1	Yes	Inadvertent-Helicopter	Feeding	Standing	look more carefully		3 km west of camp	
6/23/2008	14:00	Sik Sik	unknown	unknown	1	No	NA - No Disturbance			not applicable		North east of Pointer Lake	
6/24/2008	13:00	Caribou	Adult	Male Female	1 1	No	NA - No Disturbance	Grazing		not applicable		Fox Lake	
6/24/2008	16:00	Peregrine Falcon	unknown	unknown	2	No	NA - No Disturbance			not applicable		12.5 km NW from camp	
6/24/2008	17:30	Muskox	unknown	unknown	5	No	NA - No Disturbance	Grazing		not applicable		Sleek Lake	
6/24/2008	17:40	Caribou	unknown	unknown	2	No	NA - No Disturbance	Grazing		not applicable		4.7 NW of camp	nest with 3 eggs
6/25/2008	16:00	Peregrine Falcon	unknown	female	1	No	NA - No Disturbance	on nest		not applicable		10 km NW from camp	
6/25/2008	16:30	Rough-legged Hawk	unknown	unknown	2	No	NA - No Disturbance			not applicable		12.5 km W of camp	nest with 3 eggs
6/25/2008		Muskox	unknown	unknown	6	No	NA - No Disturbance						
6/25/2008		Caribou	unknown	unknown	1	Yes	Inadvertent-Helicopter	Feeding	Feeding	look more carefully	300 m	Andrew Lake	
6/25/2008		Muskox	unknown	unknown	20	No	NA - No Disturbance	Resting and Feeding		not applicable			
6/26/2008	9:06	Caribou	unknown	unknown	1	No	NA - No Disturbance	walking		not applicable		600 m east of camp	
6/26/2008	14:30	Muskox	Adult	Male Female	1 1	No	NA - No Disturbance	Grazing		not applicable		3.4 km NE of camp	

Date	Time	Species	Age	Sex	#	Disturbance	Cause of Disturbance	Behaviour Before Disturbance	Behaviour After Disturbance	Actions Taken to Avoid Disturbance	Distance from Disturbance in meters	Physical Location	Other Comments
6/27/2008	21:00	muskox	unknown	unknown	6	No	NA - No Disturbance			not applicable		2.5km west of camp	
6/28/2008	9:00	Sandhill Crane	unknown	unknown	1	No	NA - No Disturbance			not applicable		in camp	
6/28/2008	14:00	Muskox	unknown	unknown	24	No	NA - No Disturbance	Feeding and Walking		not applicable		4km south of camp	
6/28/2008	21:30	Caribou	Adult and Juvenile	Female and Unknown	2	No	NA - No Disturbance	Feeding		not applicable		1km West of camp	
6/28/2008	16;00	Caribou	unknown	unknown	3	No	NA - No Disturbance	walking		not applicable		1 km East of camp	
6/29/2008	8:00	Muskox	unknown	unknown	27	No	NA - No Disturbance	Resting		not applicable		10km SW of camp	
6/29/2008		Caribou	Adult	Male	1	No	NA - No Disturbance	Feeding and Walking		not applicable		1km West of camp	
6/29/2008		Caribou	Adult and Juvenile	Female and Unknown	2	No	NA - No Disturbance			not applicable			
6/29/2008		Muskox	unknown	unknown	25	No	NA - No Disturbance			not applicable		1.5 km East of END-08-036	
6/30/2008		Caribou	juvenile	male	5	No	NA - No Disturbance	resting		not applicable		south of camp	
6/30/2008		Caribou	unknown	unknown	200	No	NA - No Disturbance			not applicable		east of camp, north of Thom Lake	
7/1/2008	9:06	Caribou	unknown	unknown	1	No	NA - No Disturbance	Walking		not applicable		600 m East of camp	
7/1/2008	12:30	Caribou	unknown	unknown	22	No	NA - No Disturbance	Feeding and Walking		not applicable		1.6 km SE of camp	

Date	Time	Species	Age	Sex	#	Disturbance	Cause of Disturbance	Behaviour Before Disturbance	Behaviour After Disturbance	Actions Taken to Avoid Disturbance	Distance from Disturbance in meters	Physical Location	Other Comments
7/1/2008	14:10	Caribou	unknown	unknown	21	No	NA - No Disturbance	Feeding		not applicable		2.4 km SE of camp	
7/1/2008	19:30	Caribou	unknown	unknown	1	No	NA - No Disturbance	Walking		not applicable		10-15 km from camp	
7/2/2008	8:00	Wolf	unknown	unknown		No	NA - No Disturbance			not applicable		West of Sleek Lake	
7/2/2008	17:45	Caribou	unknown	unknown	1	No	NA - No Disturbance	Feeding		not applicable		Andrew Lake	Den
7/2/2008	17:50	Wolf	unknown	unknown	1	No	NA - No Disturbance	Traveling		not applicable		West side of Sleek Lake	
7/4/2008	5:00	Wolverine	unknown	unknown	1	No	NA - No Disturbance	Walking		not applicable		3.5 km SW of camp	
7/5/2008	9:00	Caribou	unknown	unknown	15	No	NA - No Disturbance	Feeding and walking		not applicable		West of camp	
7/5/2008	14:00	Caribou	Adult	Male	1	No	NA - No Disturbance			not applicable		2km SE of AND-08-01	
7/5/2008		Caribou	unknown	unknown	5	No	NA - No Disturbance	feeding		not applicable		5km SW of camp	
7/6/2008	8:10	Muskox	unknown	unknown	16	No	NA - No Disturbance	Feeding		not applicable		7.6 km South of camp	Stayed for 2 days
7/8/2008	21:00	Caribou	unknown	unknown	15	No	NA - No Disturbance	Walking		not applicable		100m N of camp	15 caribou (walked from West to East)
7/8/2008		Muskox and Caribou	unknown	unknown	204	No	NA - No Disturbance	Standing, Feeding and walking		not applicable		6.5 miles SE of camp	20 muskox and caribou
7/19/2008	8:00	Wolf	unknown	unknown	1	No	NA - No Disturbance			not applicable		West of Sleek Lake	1 lone wolf

Date	Time	Species	Age	Sex	#	Disturbance	Cause of Disturbance	Behaviour Before Disturbance	Behaviour After Disturbance	Actions Taken to Avoid Disturbance	Distance from Disturbance in meters	Physical Location	Other Comments
7/22/2008	20:00	Caribou	unknown	unknown	1	No	NA - No Disturbance	trotting		not applicable		in camp	
7/23/2008		Caribou	unknown	unknown	1	No	NA - No Disturbance	trotting		not applicable		in camp	
7/24/2008	16:00	Caribou	unknown	unknown	1	No	NA - No Disturbance	walking		not applicable		Camp	
7/24/2008		Caribou	unknown	unknown	1	No	NA - No Disturbance	standing		not applicable		50m North of camp	
7/25/2008	10:30	Caribou	unknown	unknown	1	No	NA - No Disturbance	walking		not applicable		50 m from camp	
7/25/2008		Caribou	unknown	unknown	1	No	NA - No Disturbance	walking		not applicable		50m North of camp	
7/26/2008	10:30	Caribou	unknown	unknown	1	No	NA - No Disturbance	walking		not applicable		150 m from camp	
7/26/2008	19:00	Rabbit	unknown	unknown	2	No	NA - No Disturbance	hopping		not applicable		Camp	
7/27/2008	15:00	Caribou	unknown	unknown	2	No	NA - No Disturbance	walking		not applicable		east of camp	
7/27/2008	16:52	Caribou	unknown	unknown	1	No	NA - No Disturbance	running		not applicable		west side of camp	
7/27/2008		Caribou	unknown	unknown	1	No	NA - No Disturbance	Walking		not applicable		Camp	running from bugs
7/27/2008		Caribou	unknown	unknown	2	No	NA - No Disturbance	Walking		not applicable		east end of camp	
7/27/2008		Caribou	unknown	unknown	2	No	NA - No Disturbance	walking		not applicable		50 m East of camp	
7/27/2008		Fox	unknown	unknown	1	No	NA - No Disturbance	walking		not applicable		1.5 km east of camp	

Date	Time	Species	Age	Sex	#	Disturbance	Cause of Disturbance	Behaviour Before Disturbance	Behaviour After Disturbance	Actions Taken to Avoid Disturbance	Distance from Disturbance in meters	Physical Location	Other Comments
7/28/2008	9:00	Muskox	unknown	unknown	2	No	NA - No Disturbance	walking		not applicable		35 km SW of camp	
7/28/2008		muskox	Adult and Juvenile	Female and Unknown	2	No	NA - No Disturbance	walking		not applicable		3.5 km S of camp	
7/28/2008		Sandhill Crane	unknown	unknown	3	No	NA - No Disturbance	flying		not applicable		1 km north of camp	
8/6/2008	17:00	Caribou	unknown	female	1	No	NA - No Disturbance	trotting		not applicable		1 km East of camp	
8/8/2008	15:15	Muskox	Adult and Juvenile	Female and Unknown	2	No	NA - No Disturbance	walking		not applicable		0.5 km SW from camp at lake	
8/9/2008	3:15	Caribou	Adult and Juvenile	Female and Unknown	2	No	NA - No Disturbance			not applicable		south of camp	
8/9/2008	8:10	Caribou	Adult	Male	1	No	NA - No Disturbance	Running		not applicable		200 m West of Camp	
8/9/2008	9:00	Caribou	Adult and Juvenile	Female and Unknown	2	No	NA - No Disturbance			not applicable		south of camp	
8/10/2008		Muskox	unknown	unknown	1	No	NA - No Disturbance	Resting		not applicable		2km SW of camp	
8/12/2008		Muskox	unknown	unknown	14	No	NA - No Disturbance			not applicable		6km SW of camp	
8/13/2008	14:43	Caribou	adult	Male	1	No	NA - No Disturbance	trotting		not applicable		0565739 7147401	
8/13/2008	14:53	Crane	unknown	unknown	2	No	NA - No Disturbance	flying		not applicable		0565096 7147510	

Date	Time	Species	Age	Sex	#	Disturbance	Cause of Disturbance	Behaviour Before Disturbance	Behaviour After Disturbance	Actions Taken to Avoid Disturbance	Distance from Disturbance in meters	Physical Location	Other Comments
8/14/2008	22:00	Muskox	unknown	unknown	4	No	NA - No Disturbance	walking		not applicable		3 km SW of camp	
8/15/2008	14:00	Caribou	unknown	unknown	6	No	NA - No Disturbance	grazing		not applicable		2 km North of camp	
8/15/2008	15:00	Muskox	unknown	unknown	2	No	NA - No Disturbance	walking		not applicable		5 km South of camp	
8/17/2008	5:45	Fox	unknown	unknown	1	No	NA - No Disturbance			not applicable		300m E of camp	
8/17/2008	5:55	Caribou	Adult and Juvenile	Female and Unknown	2	No	NA - No Disturbance	Walking		not applicable		east of camp on ridge	
8/17/2008	9:00	Caribou	adult	unknown	6	No	NA - No Disturbance	grazing		not applicable		200 m behind men's dry	
8/17/2008	18:40	Caribou	unknown	unknown		Yes	Inadvertent-Helicopter	Walking	Running	look more carefully	30 m	at camp landing pad	Chopper Flew in and did not see the caribou but saw it running near the helipad.
8/17/2008		Caribou	Adult	Male Female	1 2	No	NA - No Disturbance	Running and Walking		not applicable		near camp	
8/18/2008	6:45	Caribou	unknown	unknown	6	No	NA - No Disturbance	Walking		not applicable		800 m South of camp	
8/18/2008	8:00	Caribou	adult	Male Female	2 2	No	NA - No Disturbance	Walking		not applicable		South of camp	
8/23/2008	5:00	Caribou	unknown	unknown	20	No	NA - No Disturbance	walking		not applicable		3 km SW of camp	
8/30/2008	7:00	Weasel	unknown	unknown	1	No	NA - No Disturbance	hunting ptarmigan		not applicable		by incinerator	

Date	Time	Species	Age	Sex	#	Disturbance	Cause of Disturbance	Behaviour Before Disturbance	Behaviour After Disturbance	Actions Taken to Avoid Disturbance	Distance from Disturbance in meters	Physical Location	Other Comments
8/31/2008	7:00	Wolf	unknown	unknown	2	No	NA - No Disturbance	walking		not applicable		14 km SW of camp	
9/4/2008	16:30	Snow Geese	unknown	unknown	Approx. 117	No	NA - No Disturbance	resting		not applicable		2 km north of camp	
9/5/2008	14:00	fox	unknown	unknown	1	No	NA - No Disturbance			not applicable		south of camp	
9/11/2008	7:00	fox	unknown	unknown	1	No	NA - No Disturbance	trotting		not applicable		south of kitchen	
9/14/2008	14:00	fox	unknown	unknown	1	No	NA - No Disturbance	trotting		not applicable		south of kitchen	
9/19/2008	8:00	fox	unknown	unknown	1	No	NA - No Disturbance	walking		not applicable		30 m South of kitchen	
21/20/2008	9:30	Sandhill Crane	unknown	unknown	1	No	NA - No Disturbance	Walking		not applicable		N of Pointer Lake	

4 ENVIRONMENTAL STUDIES

There were five main components of the environmental studies undertaken in 2008, including hydrology, aquatics, terrestrial, archaeological and marine. The following sections detail the content and results of these studies. Figures are appended to the end of this section.

4.1 Hydrology Component

The focus of the 2008 hydrological assessment, performed by Golder Associates, was to gather baseline streamflow and lake water level information from drainage areas which could be impacted by the Project, both in terms of reduced flow due to water usage or augmented flows due to treated water releases.

The collection of stream discharge data and lake level monitoring is to meet the following objectives for the Project:

- collect sufficient water data to document the natural range in streamflow from selected locations to satisfy regulatory requirements;
- collect hydrology information that can be used for engineering design purposes; and
- collect baseline hydrology information that will be used in support of the Environmental Assessment.

Three hydrology field programs were conducted over the course of the 2008 open water season: June 1 to 13, July 21 to July 28, and August 31 to September 3. Three types of hydrological monitoring were performed for the Project, including instantaneous stream discharge measurements, continuous water level measurements, and lake water level measurements.

A total of 12 stream discharge monitoring stations and 7 lake elevation monitoring stations were installed near the Project (Figures 4.1 and 4.2). The locations of each monitoring station are also presented in Table 4.1. Two additional continuous water level monitoring stations were installed in 2008, each at the location of a historical hydrometric station on the Anigaq River and on Qinguq Creek.

Stream surveys of six of the larger streams along the proposed all-weather road (Table 4.1) were also conducted during the summer and fall programs. These surveys included collection of stream topographic data and stream flow measurement.

During the spring field program stream discharge and lake elevation monitoring locations were re-established and continuous stage recorders were installed. Water elevations were measured relative to local benchmarks, which in each case were large boulders

located in the vicinity of the monitoring location. Stream velocity and depth measurements were made using a standard flow meter and these measurements were used to calculate discharge. During the summer field program, water elevation and stream discharge measurements were taken at the monitoring locations and data from the continuous stage recorders were downloaded. Measurements were again taken at each location during the fall program; continuous stage recorders were again downloaded and were removed for the winter. All stream discharge measurements and lake elevation measurements are presented in Tables 4.2 and 4.3, respectively. Preliminary results for the estimations of discharge in the streams that had continuous stage recorders are provided in Table 4.4. Note that these results are preliminary only. As more data are collected, better estimations of mean discharge may be provided.

Table 4.1 Stream Discharge and Lake Elevation Monitoring Locations

Stream Discharge Monitoring Stations		
Station	**Description**	**Crossing Location (UTM - NAD 83)**
SF1	Outflow of Skinny Lake	14 W 571655 7155266
SF2	Fox Lake Inflow(a) 1	4 W 563554 7146242
SF3	Northeast Inflow of Pointer Lake	14 W 565717 7147088
SF4	Outflow of Sik Sik Lake(a)	14 W 565790 7140386
SF5	Outflow of Pointer Lake(a)	14 W 566477 7140840
SF6	Outflow of Shack Lake(a)	14 W 558223 7131912
SF7	Anigaq River(a)	14 W 574605 7134734
SF8	Outflow of Siamese Lake(a)	14 W 580364 7146775
SF9	Outflow of Squiggly Lake(a)	14 W 552993 7163630
SF10	Tributary to the Northeast Inflow of Pointer Lake	14 W 565328 7146771
SF11	Northwest Inflow of Pointer Lake	14 W 565015 7144882
SF12	Outflow of Jaeger Lake	14 W 567690 7143581
SF13	Anigaq River(a)	14W 617197E 7123147N
SF14	Qinguq Creek(a)	14W 629926E 7128166N
28	All Weather Road Crossing	14W 609698 7151158
32	All Weather Road Crossing	14W 599843 7148079
33	All Weather Road Crossing	14W 590167 7152092
36	All Weather Road Crossing	14W 586366 7151107
57	Haul Road Crossing	14 W 561309 7140009
58	Haul Road Crossing	14W 558421 7138323
Lake Elevation Monitoring Stations		
Station	**Description**	**Benchmark Location (UTM - NAD 83)**
LE1	Pointer Lake	14 W 565652 7142467
LE2	Unnamed Lake Downstream of Cirque Lake	14 W 563603 7146244
LE3	Judge Sissons Lake	14 W 574537 7134751
LE4	Squiggly Lake	14 W 556354 7156066
LE5	Skinny Lake	14 W 571626 7154893
LE6	Kavisilik Lake	14 W 571712 7155299
LE7	Siamese Lake	14 W 576086 7151648

Table 4.2 Stream Discharge Measurements in 2008

Station	Date	Discharge (m^3/s)	Station	Date	Discharge (m^3/s)
SF1	22-Jul-08	0.2467	SF8	22-Jul-08	1.869
	31-Aug-08	0.7446		24-Jul-08	1.616
SF2	2-Jun-08	0.0634		24-Jul-08	1.561
	6-Jun-08	0.0227		1-Sep-08	0.574
	8-Jun-08	0.2505	SF9	22-Jul-08	0.631
	23-Jul-08	0.0302		31-Aug-08	0.749
	1-Sep-08	0.2636	SF10	2-Jun-08	0.007
SF3	2-Jun-08	0.0205		6-Jun-08	0.001
	8-Jun-08	0.1459		10-Jun-08	0.049
	23-Jul-08	n/a		2-Sep-08	0.008
	2-Sep-08	0.0305	SF11	2-Jun-08	0.113
SF4	4-Jun-08	0.0295		6-Jun-08	0.061
	9-Jun-08	0.1533		8-Jun-08	0.403
	23-Jul-08	0.0041		22-Jul-08	0.004
	1-Sep-08	n/a		1-Sep-08	0.169
SF5	10-Jun-08	3.3033	SF12	24-Jul-08	0.127
	23-Jul-08	0.3443		1-Sep-08	0.343
	1-Sep-08	0.3049	28	26-Jul-08	0.361
SF6	6-Jun-08	0.154	32	26-Jul-08	0.299
	8-Jun-08	0.166	33	25-Jul-08	3.296
	21-Jul-08	0.218	36	25-Jul-08	1.109
	1-Sep-08	0.507	57	2-Sep-08	0.274
SF7	5-Jun-08	1.149	58	2-Sep-08	0.181
	8-Jun-08	3.363			
	10-Jun-08	10.572			
	23-Jul-08	12.001			
	2-Sep-08	4.296			

Table 4.3 Measured Lake Elevations, 2008

Station	Lake	Date	Elevation (m)
LE1	Pointer Lake	12-Jun-08	98.595
		23-Jul-08	98.241
		1-Sep-08	98.236
LE2	Unnamed Lake Downstream of Cirque Lake	2-Jun-08	98.905
		6-Jun-08	98.812
		8-Jun-08	98.941
		12-Jun-08	99.033
		22-Jul-08	98.769
		1-Sep-08	98.858
LE3	Judge Sissons Lake	5-Jun-08	99.623
		8-Jun-08	99.645
		10-Jun-08	99.690
		23-Jul-08	99.679
		2-Sep-08	99.616
LE4	Squiggly Lake	22-Jul-08	96.486
		31-Aug-08	96.416
LE5	Skinny Lake	22-Jul-08	99.264
		31-Aug-08	99.312

Station	Lake	Date	Elevation (m)
LE6	Kavisilik Lake	22-Jul-08	98.229
		31-Aug-08	98.196
LE7	Siamese Lake	22-Jul-08	97.135
		1-Sep-08	97.012

Table 4.4 Monthly Mean Discharge Estimates (m^3/s) in 2008

Station	Jun	Jul	Aug	Sep
SF2	0.55	0.08	0.04	0.19
SF3	0.19	0.01	n/a	n/a
SF4	0.21	0.01	0.01	0.03
SF5	4.71	0.85	0.04	0.28
SF6	2.36	0.77	0.05	0.73
SF7	23.99	11.77	3.09	3.33
SF8	n/a	1.31	0.57	0.57
SF9	n/a	n/a	0.36	0.14
SF13	125.14	53.09	11.46	21.18
SF14	23.43	5.38	2.89	10.65

4.2 Aquatic Component

There were three objectives for the 2008 aquatics baseline program (conducted by Golder Associates) selected to support various components of the Project, including lakes and streams in the vicinity of the proposed mine site, streams along the proposed access road, and studies in Baker Lake. These are discussed in the following sections, with figures presented at the end of Section 4.

4.2.1 Kiggavik Area

The objective of the 2008 Kiggavik area program was to continue to collect aquatics baseline information in various lakes, streams, and rivers of the Kivalliq region. The baseline data will be used to support the preparation of an environmental impact assessment and fish habitat.

The program included 22 lakes, 22 streams, and 1 river during three sampling seasons (spring, summer, and fall). The study area for the program included lakes (Pointer, Sik Sik, Rock, Willow, Mushroom, End Grid, Cigar, Knee, Lunch, Andrew, Shack, Lower, Ridge, Cirque, Crash, Fox, Caribou, Calf, Judge-Sissons, Siamese, Skinny, and Squiggly lakes [Figure 4.3]) and their streams tributaries (Figure 4.4). Several stream crossings along the proposed all-season road corridor were also sampled; including stream crossings 28 and 33 as well as the Thelon River (Figure 4.5).

The baseline aquatics program included water and sediment sampling; benthic invertebrate community (BIC), periphyton, phytoplankton, and zooplankton collection; habitat and lake bathymetry mapping; spawning surveys for Arctic grayling (*Thymallus arcticus*) and lake trout (*Salvelinus namaycush*); fish community and health surveys; and

collection of fish tissue for chemical analysis. The road crossing program included fish habitat assessment and fish limited fish sampling.

Spring Baseline Program – The primary objective of the spring program was to assess tributary streams, immediately following ice-out, for spawning Arctic grayling. Stream sampling included water collection, fish habitat assessment, and Arctic grayling spawning survey. Non-lethal fish capture methods such as angling, backpack electrofishing, and minnow trapping were utilized. External health assessments; length and weight data; and non-lethal ageing structure were collected from all fish captured. Passive Integrated Transponder (PIT) tags were applied to Arctic grayling and lake trout prior to release. Fish species captured during the 2008 spring program included Arctic grayling (*n*=1), lake trout (*n*=19), and ninespine stickleback (*Pungitius pungitius*; *n*=3).

Summer Baseline Program – The summer program was focused on the lakes in the Project area. Lake sampling included collecting water, phytoplankton, and zooplankton samples; fish habitat assessments and bathymetry surveys; fish community surveys, and collection of fish tissue samples for chemical analysis. Non-lethal and lethal capture methods were used to capture fish, including angling, short-duration and overnight gill netting, and minnow trapping. External health assessments were carried out on captured fish and non-lethal ageing structures were collected. A PIT tag was applied to Arctic grayling and lake trout prior to release. Fish species captured during the 2008 summer program included: Arctic grayling (*n*=108), burbot (*Lota lota*; *n*=7), cisco (*Coregonus artedi*; *n*=92), lake trout (n=122), ninespine stickleback (*n*=41), round whitefish (*Prosopium cylindraceum*; *n*=50). Specimens from the following species were retained for chemistry analysis: Arctic grayling (*n*=15), round whitefish (*n*=11), and lake trout (*n*=15). An internal health examination was performed on retained fish and tissue samples were taken for chemical analysis.

Fall Baseline Program – The fall program included both stream and lake components. Stream sampling included collection of water, BIC, and periphyton (algae that grows attached to boulders) samples. Benthic invertebrate samples were collected in erosional areas of the streams. Lake sampling included collection of sediment, BIC surveys, water, phytoplankton, and zooplankton samples. Fish sampling was focussed on lake trout to attempt to locate spawning areas. The fall program included only non-lethal fish capture methods, such as angling and short-duration gill nets. Only 21 lake trout were captured during the fall sampling. Lake trout in spawning condition were captured in five lakes (Mushroom, Cigar, Ridge, Judge Sisson and Siamese lakes).

A summary of the fish species captured or observed during the 2008 aquatic field program are presented in Table 4.5 (lakes) and Table 4.6 (streams). The tables present only the lakes and streams where fish were caught or observed. Arctic grayling and round whitefish were the most widely distributed species in the lakes sampled in 2008. Lake trout were commonly found in streams (Table 4.6), which suggests that the

streams are important habitat (e.g., movement corridors) for this normally lake dwelling species.

Table 4.5 Summary of the fish species captured or observed in Kiggavik area lakes

Location	Arctic grayling	Lake trout	Round whitefish	Cisco	Burbot	Ninespine stickleback
Willow Lake Sub Basin						
Pointer Lake	√	√		√		√
Rock Lake	√					
Lower Lake Sub Basin						
Mushroom Lake	√	√	√			
Cigar Lake		√	√	√	√	
Knee Lake	√					
Lunch Lake	√		√			
Andrew Lake	√		√			
Shack Lake	√					
Lower Lake	√		√		√	√
Caribou Lake Sub Basin						
Ridge Lake		√				
Fox Lake	√			√		√
Caribou Lake	√	√	√	√	√	√
Calf Lake				√	√	√
Other Systems						
Judge Sissons Lake	√	√	√	√	√	√
Siamese Lake		√				

Table 4.6 Summary of the fish species captured or observed in streams

Location	Arctic grayling	Lake trout	Ninespine stickleback
Willow Lake Sub Basin			
Northeast Inflow of Pointer Lake			√
Northwest Inflow of Pointer Lake		√	
Rock/Willow Stream	√		

Location	Arctic grayling	Lake trout	Ninespine stickleback
Lower Lake Sub Basin			
Mushroom/End Grid Stream		√	
End Grid/Shack Stream	√		
Knee/Lunch Stream		√	
Shack/Lower Stream		√	
Lower/Judge Sissons Stream		√	√
Calf/Judge Sissons Stream	√	√	
Road Crossings			
Thelon River		√	
X-28		√	
X-33		√	

Fall Road Crossing Program – Due to time constrains, only three crossings along the proposed road corridor were sampled. Sampling included documenting fish habitat upstream and downstream of each crossing. Limited fish sampling (angling only) was conducted. Only lake trout (*n*=11) were captured during the stream crossing assessments. Lake trout were captured at all three crossings assessed in 2008 (Table 4.6).

4.2.2 Baker Lake

The objective of the Baker Lake aquatic surveys (conducted by Nunami Jacques Whitford and local assistants) was to collect and summarize baseline information on water and sediment quality, fish presence, zooplankton and benthic invertebrate populations, lake bathymetry and foreshore habitat characteristics of Baker Lake. The water, zooplankton and fish survey data provide a snapshot of conditions at the time of sampling, whereas sediment, benthic invertebrate, bathymetry and foreshore surveys provide information useful in characterizing baseline conditions throughout the year. To ensure local input to the studies, Nunami staff met with the Baker Lake HTO and the Community Liaison Committee.

The baseline freshwater assessment was conducted between September 18 and 21, 2008. Field surveys were conducted at five sites on Baker Lake to assist in selection of suitable sites for loading facilities and access road (Figure 4.6). Sites 1, 2 and 3 were on the north shore of the lake, Site 4 was on the south shore in a bay protected by islands and Site 5 was on the west shore. Water depths ranged from 8 m to 13.5 m at Sites 1, 2 and 3 and were 1.5 m and 1.25 m, respectively at Sites 4 and 5.

Water samples were collected to provide information on water quality of Baker Lake during autumn. Temperature and dissolved oxygen profiles for Sites 1, 2 and 3 indicate that waters were isothermal, suggesting a well mixed water column. Profiles were not developed for Sites 4 and 5, as they were very shallow (1.5 m or less). In general, water quality was typical of an undisturbed, oligotrophic lake, as reported for previous studies in the Kivalliq region. Concentrations of nutrients, hardness, alkalinity and most metals were low and water was clear with circum-neutral pH. Levels of many metals were below analytical detection limits and, with the exception of aluminum at Site 4, metals levels were below Canadian Council of Ministers of Environment (CCME) guidelines for protection of aquatic life.

Sediment samples were analyzed for particle size, nutrients, metals, polycyclic aromatic hydrocarbons (PAH) and radionuclides. Sites 1, 2, 3, and 4 had similar substrate composition (mainly sand), and Site 5 had a higher proportion of silt along with sand. Organic content was low (<0.6% total organic carbon). In most samples, metals levels were below CCME Freshwater Interim Sediment Quality Guidelines (ISQG), and antimony and cadmium were below laboratory detection levels. Levels of arsenic exceeded ISQG in samples from Sites 2, 4 and 5, but were below the probable effects level (PEL). Chromium concentrations at Sites 1 and 3 were higher than ISQG levels but not PEL guidelines. Results were similar to historic data in the Kivalliq region, although concentrations of boron (Site 5), chromium (Sites 1 and 3), titanium (Site 5) and uranium (Site 3) were higher for 2008 than for historic results. PAH levels were low in the 2008 survey, near analytical detection limits, with values for individual compounds well below CCME ISQG and PEL guidelines.

Fish populations were assessed using long-lining and gillnets at Site 1. However, neither sampling method yielded fish. Historic information for Baker Lake indicate eleven species are likely to be present, including lake trout, burbot, Arctic char, Arctic grayling, lake cisco, longnose sucker, ninespine stickleback, fourhorn sculpin, slimy sculpin, round whitefish and lake whitefish.

Zooplankton populations were sampled to provide information about the ecology and productivity of Baker Lake. Mean density ranged from 27,000 organisms/m^2 (Site 5) to 340,000 organisms/m^2 (Site 4). Rotifers were the most abundant organisms, with *Kellicottia longispina* predominant at all sites and *Keratella cochlearis* predominant at Sites 2 and 4. Taxon richness, diversity and density of organisms were highest at Site 4, perhaps due to its location in a small, protected bay, with inputs from freshwater tributaries and little flushing.

Benthic invertebrate community composition and abundance were assessed. Mean density ranged from 821 organisms/m^2 (Site 2) to 2,058 organisms/m^2 (Site 3). Taxon richness and diversity were highest at Site 4; richness was lowest at Site 3 and diversity was lowest at Sites 2 and 5. Chironomids (midges), Nematodes (roundworms), Enchytraeidae (Oligochaete worms) and Naididae (Oligochaete worms) were

predominant, with relative abundance varying among sites. Number of taxa and density were similar to results from previous surveys in the Kivalliq region.

Bathymetric surveys were conducted at the five sites on Baker Lake to assist in selecting a suitable location for docking facilities. Conditions were most suitable at Site 2, which had the deepest water (up to 14.4 m), the most uniform lake bottom and steepest slopes close to shore.

Foreshore habitat was characterized at transects perpendicular to the shoreline at the five sites. At each surveyed site, two or three distinct habitat zones were identified: one shoreline and one or two backshore zones. In general, the shoreline zone consisted of a relatively homogeneous mix of sand, gravel, cobble and boulder, with no vegetation present. The backshore zones consisted of more varied substrate composition and vegetation species such as grasses and willow (*Salix* sp.).

4.3 Terrestrial Component

The terrestrial baseline work completed in 2008 consisted of both wildlife studies and vegetation and soil studies. These studies were conducted by Gebauer and Associates with assistants from the community and the results were presented to the Community Liaison Committee.

4.3.1 Wildlife

The primary objectives of the wildlife assessment were to document relevant existing traditional and scientific knowledge on key wildlife species and to supplement this knowledge with dedicated wildlife surveys in the Kiggavik area. Comprehensive information on species status, biology, distribution and abundance will be particularly important in determining potential Project effects on wildlife resources. The specific objectives of the terrestrial environmental studies were to:

- Collect information on the current wildlife species and habitats in the study area, including the identification of listed and uncommon species, and critical terrestrial habitats;
- Obtain estimates of natural variation in biophysical variables, and species presence, richness, abundance, and distribution;
- Implement environmental design features and management plans during the design of the Project to avoid or limit disturbance to biophysical variables and habitats, particularly sensitive ecological attributes;
- Help predict effects from the Project on current ecological conditions, species and habitats; and
- Provide data for comparison to environmental effects monitoring programs during construction and operation to test impact predictions, and the effectiveness of environmental design features and management plans.

4.3.2 Study Area

In 2008, a revised Regional Study Area (RSA) was established, which incorporated all of the proposed Project components including several proposed access road options. The RSA is 150 km long and 70 km wide (9,060 km^2), and includes all of Judge Sissons Lake and southern portions of Aberdeen and Schultz lakes (Figure 4.7). The spatial extent of the RSA was selected based on current study area sizes for caribou and other large mammals (Muskox, Grizzly Bears, wolves) for other mining projects in Nunavut, the proposed mine plan for the Project, and known caribou water crossing locations along the Thelon River basin. The RSA may be reduced in 2009 if a preferred access road location has been determined.

The 2008 Local Study Area (LSA) at the Project site is centered on the Kiggavik and Sissons deposits with an approximate 5 km buffer around all proposed Project facilities, including proposed airstrips and inter-mine access roads. Dimensions of the site LSA are approximately 29 km wide by 20 km wide for a total area of 450 km^2 (Figure 4.8). The Access Road LSA includes a 5 km wide LSA centered on the proposed road alignment.

4.3.3 Ungulates (Caribou and Muskox)

Height-of-Land Surveys

Height-of-land surveys were conducted on an almost weekly basis during the 2008 field season (i.e., June to September). The three primary objectives of the height-of-land surveys were: 1) to identify wildlife species utilizing the Kiggavik LSA; 2) determine seasonal abundance and group composition of key species such as Caribou; and 3) to identify wildlife aggregations or predator presence that may have implications for current camp or drilling operations. The methodology allows discontinuation of aerial surveys of the LSA, which were an unnecessary disturbance to wildlife, particularly Caribou.

Twenty (20) height-of-land survey locations were established within the LSA (Figure 4.9). Surveys are stationary and consist of a 15 minute observation period where all wildlife presence and distance from survey point are documented. The following information was collected during the height-of-land surveys:

- date and time;
- number of animals, group size;
- sex (male or female);
- age (calf, yearling, adult);
- habitat use (Ecological Land Classification unit);
- behaviour (resting, foraging, walking, running, etc.);
- direction of travel (N, NE, E, SE, S, SW, W, NW); and
- location and proximity to mine facilities.

In general, few Caribou and Muskox were observed on Height-of-Land Surveys between June 2 and September 6, 2008.

Aerial Survey of RSA

Aerial surveys of the RSA were conducted on five occasions between May and October 2008. The 14 transects (i.e., variable length and spaced every 10 km) (Figure 4.7) are oriented perpendicular to the proposed access road in order to better determine whether Caribou or Muskox are utilizing all habitats (both near and far from road) at similar levels. With an effective viewing or survey distance of 1,000 m (i.e., 500 m on each side of the fixed-wing aircraft), approximately 10% of the RSA was covered during the surveys. Total transect length was 1,030 km.

Prior to each aerial survey, weather conditions were documented and the aircraft windows and/or wing struts were calibrated to the proper transect strip width (included putting a piece of tape on the window to aid each observer in determining animals that are 'in' or 'out' of the survey area). All animals seen below the tape were considered to be within the transect strip. Flight altitude and ground speed averaged approximately 150 m (agl) and 160 kph, respectively. A minimum of three observers participated on each survey: the pilot, a navigator/ observer, and an observer on the pilot's side of the aircraft. The pilot concentrated on maintaining altitude, ground speed and staying on transect. The navigator/observer assisted the pilot in staying on track, plotting individual observations on a map, collecting waypoints for each observation, and reporting animals on his/her side of the aircraft. The second observer communicated his/her observations for the navigator to record.

The GPS locations of all wildlife sightings or observations were recorded. At a minimum, the number of individuals was determined and, if possible, information on sex and age class. Observations of animals made while ferrying between transects were recorded separately.

Caribou were commonly seen on the fall and early winter aerial surveys, while Muskox were more commonly encountered in spring and summer. The largest group of Caribou observed during the surveys was of 200 animals (early October), while the largest herd of Muskox, seen on the May survey, consisted of 80 individuals. Table 4.7 provides a preliminary summary of Caribou and Muskox numbers by RSA survey in 2008.

Table 4.7 Caribou and Muskox Abundance on 2008 Aerial Surveys of the Kiggavik RSA

	Caribou		Muskox	
Survey Date	**Cumulative #**	**# of groups**	**Cumulative #**	**# of groups**
23 May	19	7	127	7
22 July	44	4	52	11

	Caribou		Muskox	
Survey Date	**Cumulative #**	**# of groups**	**Cumulative #**	**# of groups**
09-10 September	120	23	130	10
02-03 October	802	70	40	5
30 October (partial)	619	47	0	0

Aerial Survey of LSA

Aerial surveys of the LSA were conducted on three occasions between May and September 2008. Eighteen transects of variable length and spaced at 1.5 km were required to survey the 450 km^2 study area. With an effective viewing or survey distance of 1,000 m (i.e., 500 m on each side of the aircraft), approximately 67% of the RSA was covered during the surveys. Total transect length was 330 km. Survey methodology was similar to that described above for the RSA surveys.

Table 4.8 provides a preliminary summary of Caribou and Muskox numbers by LSA survey in 2008. In general, few Caribou and Muskox were observed within the LSA during aerial surveys.

Table 4.8 Caribou and Muskox Abundance on 2008 Aerial Surveys of the Kiggavik LSA

	Caribou		Muskox	
Survey Date	**Cumulative #**	**# of groups**	**Cumulative #**	**# of groups**
25 May	40	3	5	1
28 July	0	0	3	2
07 September	13	5	0	0

4.3.4 Predatory Mammals

Although no dedicated surveys were conducted for large mammalian predators, sign and individuals were recorded on aerial, Height-of-Land and other wildlife surveys undertaken in 2008.

Wolves were observed on three of the five surveys of the RSA. A pack of seven wolves was seen on the early September aerial survey, a lone individual was seen on the early October survey and pack of five wolves and an individual were seen on the late October survey.

Grizzly Bear or Wolverine were not seen on any of the aerial surveys; however, Grizzly Bear sign, and a small number of individuals were reported anecdotally during the course of the 2008 field season.

4.3.5 Upland Breeding Birds

In 2008, twenty-five (25) PRISM (Program for Regional and International Shorebird Monitoring) plots (300 x 400 m) were established at the proposed mine site and 20 plots were established at a nearby reference site, in an area not likely to be influenced by proposed mine-related activities (but within the RSA) (Figure 4.10). The primary purpose of the program was to document bird abundance and diversity within the LSA and to establish a baseline data set for long-term monitoring purposes. Upland breeding birds, including all passerines (migratory songbirds), ptarmigan and shorebirds, were the primary focus of the surveys.

Two observers, spaced at 25 m intervals, walked slowly back and forth (north-south direction) across each plot (~1.5 hours per plot) and recorded all birds and nests observed. Orientation on the plots was accomplished with handheld GPS units. Sightings were recorded on plot maps using predetermined codes for nests, probable nests, pairs, males, females, birds of unknown sex, and groups. The plot surveys were conducted in the latter half of June, which is the primary nesting period for most upland bird species. All 45 plots were surveyed during the 2008 monitoring period.

Ten 3 km long breeding bird transects were also established perpendicular to the proposed northern access road. Upland breeding birds, including all passerines (migratory songbirds), ptarmigan and shorebirds, were the primary focus of the transect surveys (Figure 4.11). Survey results were recorded in 100 m intervals, so that potential 'zone of influence' or 'reduced habitat effectiveness' impacts could be determined. Three replicates of the 10 bird transects were conducted in 2008. Surveys were conducted in the latter half of June, which is the primary nesting period for most bird species.

A detailed analysis of PRISM plot and transect surveys has not yet been completed. Preliminary results indicate that the most common breeding bird species include Lapland Longspur, Horned Lark, Savannah Sparrow, Willow Ptarmigan, Rock Ptarmigan and Semipalmated Sandpiper.

4.3.6 Waterbirds

All shorelines within 200 m (considered to be the "zone of influence" for waterbirds) of Project facilities within the Kiggavik LSA were surveyed for the presence of waterbird nests in 2008 (Figure 4.12). Total length of waterbird nest transects was approximately 40 km. Surveys were conducted in the first two weeks of July, the prime nesting period for waterbirds. Two observers walked around the edges of islands, wetlands or shorelines, with one observer 5 m from the water's edge and the second observer 15 m from the water's edge (i.e., 10 m between observers). UTM locations (taken with a

handheld GPS unit) of all waterfowl and shorebirds and their nests were recorded on datasheets.

Migratory waterfowl were also counted during the RSA and LSA aerial surveys. Aerial survey methodology was similar to what was described previously.

A number of waterbirds were recorded during the waterbird nest surveys, but few nests were encountered (see Table 4.9 for a preliminary summary of the waterbird nest surveys). The most common waterbird species were Long-tailed Duck, Semipalmated Sandpiper, Red-necked Phalarope and Dunlin.

Table 4.9 Waterbird Species and Nests Observed within the Kiggavik LSA during Waterbird Nest Surveys

Waterbird Species	Cumulative # of Individuals	# of Nests
American Golden-Plover	2	
Canada Goose	5	Probable nest on island
Dunlin	14	Nest with 2 eggs
Greater Scaup	3	Nest with 4 eggs
Greater White-fronted Goose	3	
Green-winged Teal	1	
Long-tailed Duck	56	Nest with 7 eggs
Northern Pintail	6	
Parasitic Jaeger	2	Nest with 2 eggs
Red-breasted Merganser	1	Nest with 7 eggs
Red-necked Phalarope	16	
Sandhill Crane	3	
Semipalmated Sandpiper	29	
Stilt Sandpiper	2	Significant occurrences

On the aerial surveys of the RSA and LSA, numerous migrating Snow Geese were observed during the fall surveys. Preliminary results are provided in Tables 4.10 and 4.11, respectively.

Table 4.10 Waterbird Abundance on 2008 Aerial Surveys of the Kiggavik RSA

	Snow Goose		Canada Goose		Tundra Swan	
Survey Date	**Cum #**	**# Groups**	**Cum #**	**# Groups**	**Cum #**	**# Groups**
23 May	72	6	0	0	0	0
22 July	50	1	234	9	33	16
09-10 September	11,994	59	72	6	24	11
02-03 October	0	0	0	0	9	3

	Snow Goose		Canada Goose		Tundra Swan	
Survey Date	**Cum #**	**# Groups**	**Cum #**	**# Groups**	**Cum #**	**# Groups**
30 October (partial)	0	0	0	0	0	0

Table 4.11 Waterbird Abundance on 2008 Aerial Surveys of the Kiggavik LSA

	Snow Goose		Canada Goose		Tundra Swan	
Survey Date	**Cum #**	**# Groups**	**Cum #**	**# Groups**	**Cum #**	**# Groups**
25 May	4	1	45	4	0	0
28 July	0	0	101	5	1	1
07 September	18,670	46	131	6	0	0

4.3.7 Raptors

Raptor nest surveys were conducted in June 2008 along the proposed all-weather road and within the proposed mine development area. The survey along the proposed all-weather road involved three transects along the proposed alignment, one situated on the alignment and two situated 500 m on either side of the proposed centreline.

Raptors were also encountered on aerial, waterbird nesting, breeding bird and other ground surveys.

Six active Peregrine Falcon nests and one active Rough-legged Hawk nest were recorded on the aerial and ground-based surveys of the proposed northern all-weather road (see Figure 4.13). Some of the nests were situated in close proximity to the proposed road alignment.

Other raptors observed during 2008 monitoring work included, Snowy Owl, Gyrfalcon, and Short-eared Owl. Short-eared Owl is a species of Special Concern federally. One individual was observed in the Sissons area, while another was encountered adjacent to the proposed haul road between Caribou and Sleek lakes. Nesting is expected to occur given the availability of suitable habitats in the area.

4.3.8 Wildlife Habitat

Initially, an unsupervised classification was performed on the Landsat TM satellite image (scene 036/015) that covers the RSA. Spectral signatures of individual pixels were compared to the signatures of computer-derived classes and then each pixel was assigned to one of these classes. The classification yielded 67 unique classes, which were then examined against the imagery and grouped into similar ELC types resulting in 16 unique ELC classes. These 16 classes were subsequently used as the basis for the delineation of the field sample sites used to 'ground truth' the information. 'Ground Truth' sample sites are important to the ELC mapping process as they provide additional

information on the landscape and help with the following aspects of the mapping process:

The field program was conducted in the later part of July 2008, which is within the growing season. Detailed information related to 107 of the pre-selected sites was recorded and photographs were taken during the sample program. Information relating to landform characteristics (e.g., slope, hummocks, tussocks, etc.), moisture regime, substrate (e.g., peat, moss, boulder, bedrock, etc.) and vegetation breakdown was collected and entered into a Microsoft Access database once back in the office.

For the final classification, the detailed information for each sample site, including substrate, vegetation composition, moisture regime and landform characteristics were examined and assigned an ELC class. The classified sites were overlaid on the preliminary ELC classification in order to compare attribute assignments. Each preliminary class was then examined and refined based on the sample site class and details. Any preliminary class that contained multiple ELC classes (derived from the sample sites) was then extracted and a supervised classification was performed on this subset. A supervised classification uses areas defined by the interpreter (training areas) to assign each pixel to pre-defined ELC classes. The training areas were defined from the sample sites collected in the field program. This method allows better separation of similar types of classes (e.g., Graminoid/Shrub Tundra, Shrub Tundra and Heath Tundra).

The ELC dataset developed from the Landsat imagery provides a baseline for future analysis. For example, the dataset can be used to derive wildlife habitat suitability maps or to assess the amount of ELC units being removed by development. The results of the ELC mapping are summarized for the RSA and LSA in Tables 4.12 and 4.13, respectively and illustrated in Figure 4.14.

Table 4.12 Percentage of ELC Classes in the Kiggavik RSA

ELC Class	Area (ha)	% of RSA
Water	173,397	19.2%
Sedge Association	181,772	20.1%
Graminoid/Shrub Tundra	223,015	24.7%
Shrub Tundra	102,662	11.4%
Heath Tundra	145,016	16.0%
Heath/Rock Complex	10,870	1.2%
Lichen/Rock Complex	36,683	4.1%
Gravel/Sand	1,771	0.2%
Rock	15,317	1.7%
Disturbance	40	0.0%

ELC Class	Area (ha)	% of RSA
Cloud/Shadow	13,675	1.5%
Total	904,217	100%

Table 4.13 Percentage of ELC Classes in the Kiggavik LSA

ELC Class	Area (ha)	% of LSA
Water	5,792	12.9%
Sedge Association	8,219	18.3%
Graminoid/Shrub Tundra	12,039	26.7%
Shrub Tundra	9,502	21.1%
Heath Tundra	8,657	19.2%
Heath/Rock Complex	261	0.6%
Lichen/Rock Complex	347	0.8%
Gravel/Sand	36	0.1%
Rock	156	0.3%
Total	45,009	100%

4.3.9 Vegetation and Soil Chemistry

To assess the future impacts of airborne contaminants on wildlife, plant tissue (i.e., berries, sedges, lichen) and soil samples were collected from 10 locations (seven mine or treatment sites and three far field sites) in the vicinity of the proposed Kiggavik mine site, and analyzed for metal content (Figure 4.15). At each of the 10 sampling locations, five samples were selected within a 200 to 300 m radius, at least 150 m from each other. Within each sample site, five grab samples each of tissue and soil samples were collected within a 10 to 30 m area depending on the tissue. Soil samples were collected using a composite sampling method at each sample site. Representative grab samples were collected from five separate test pits per sample site using a stainless steel ladle. Plant tissues were collected by randomly selecting and simply grabbing/pulling representative plant tissues within an approximate 5 m radius area. For berries, approximately two cups were collected at each site.

Metal analyses were undertaken by the ALS Laboratory Group in Vancouver, BC. Analytical results are not yet available.

4.4 Archaeological Component

In July 2008, Golder Associates (Golder) and a local assistant conducted an archaeological survey on behalf of ARC. The survey was completed under Permit No. 08-024A. This was the second field season of survey conducted by Golder for the Project.

The primary purpose of the 2008 archaeological survey was to continue to collect information on heritage resources in proximity to the Project. This included pedestrian survey and low level helicopter survey. The survey included areas in proximity to several lakes including parts of Siamese Lake, Judge Sissons Lake, Skinny Lake, and Mushroom Lake in addition to the Thelon River. Also, numerous uplands features were examined.

Over the six days of survey, 34 new sites were identified and nine previously recorded sites were revisited (see Figure 4.16). Of the newly recorded sites, the most common feature was the caribou cache. Thirteen sites contained a total of 31 caches. Although the majority of these features were opened, several were relatively recent and caribou bone was visible within them. Tent rings/squares were the next most common feature, with a total of 25 features identified at 18 campsites. Eight hearths/fire pits were recorded, most often found within the tent rings. Eight hunting blinds, five inuksuit, three qarmats, and two sets of kayak stands were also recorded. Lastly, four lithic scatter sites were identified, which consisted primarily of flakes from stone tool manufacture.

Looking east to the Thelon River

Measuring in a stone feature

4.5 Marine Component

Field surveys were conducted by Nunami Jacques Whitford and community assistants between September 10 and 15 and were designed in part from information provided by the Aqigiq Hunters and Trappers Organization and the Chesterfield Inlet Council. Standard aerial survey protocols and equipment were employed for coverage of Chesterfield Inlet, nearshore and offshore regions of Chesterfield Inlet.

The 2008 field survey was successful in collecting available literature, expert and local knowledge and field data to better understand temporal and spatial variability in marine mammal abundance and distribution in relation to the study area. As anticipated, beluga whales and seals were observed during the survey. Contrary to expectations, the majority of beluga whales were sighted close to shore, and not farther offshore as other information on fall beluga use of the area would suggest. Behaviours observed of beluga whales, and relative widespread sighting distribution within the survey area is consistent with the predicted northward migration. The coastal nature of 2008 beluga sightings may be natural variation (seasonal or annual), presence of killer whales or inadequate offshore survey coverage.

A notable difference in relative abundance of beluga whales during the survey period (between the first two, and following three, survey days) suggests a notable change in

habitat use; however conclusions relating to possible causes were not possible with available information.

Ringed and/or harp seals are likely common throughout the survey area, and in similarly low densities as observed elsewhere in Nunavut. Seals were observed up to 160km in land. Surveys conducted here confirm earlier conclusions that the survey area is not common bowhead whale habitat, but contradict predictions of suitable habitat, historic bowhead use of this region and Inuit local information of the area. As anticipated, field surveys did not record polar bears, walrus or killer whales during the 2008 field season. However, reports of killer whales one week prior to surveys suggest this species may not be as uncommon as historically believed.

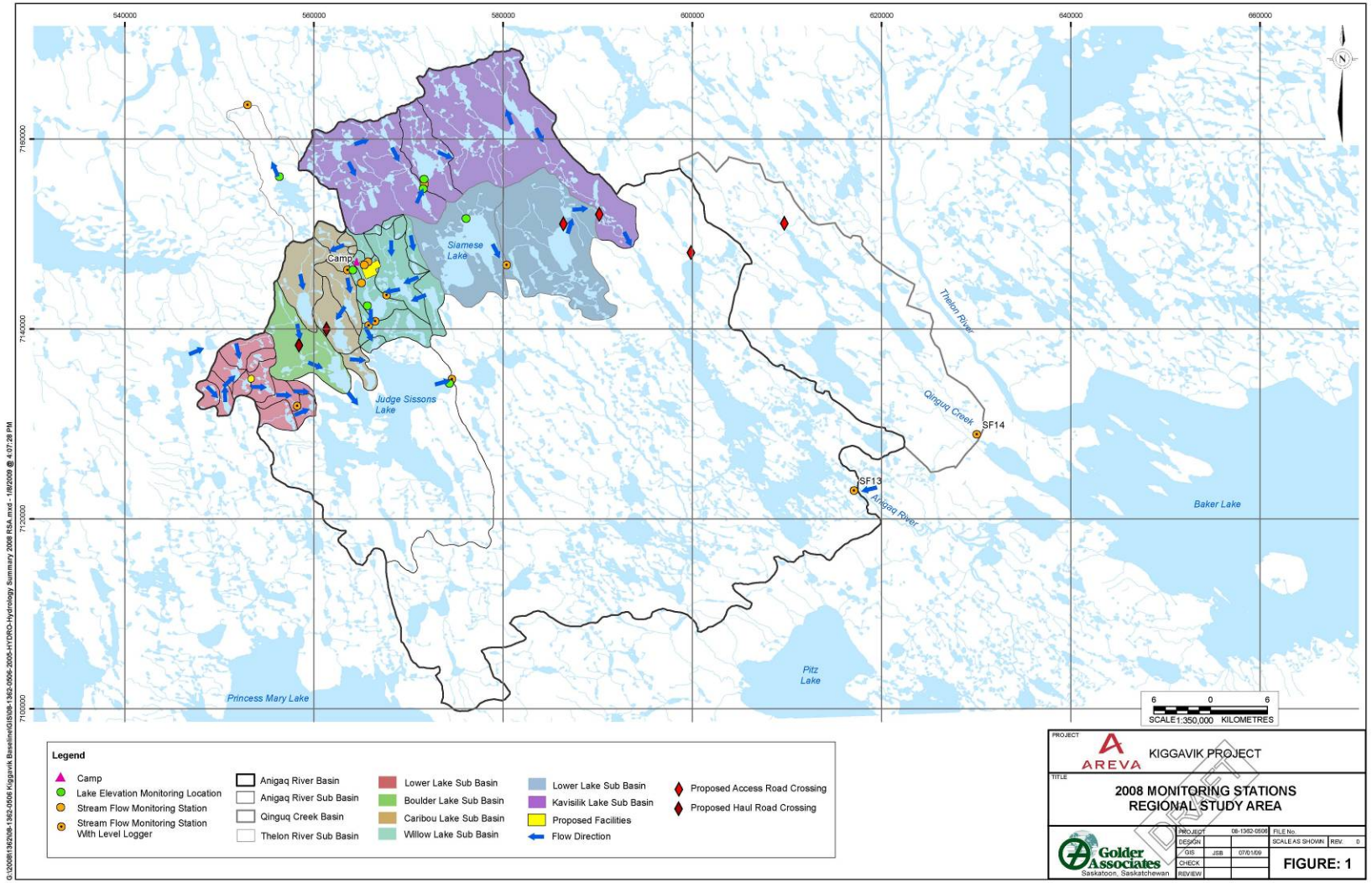

Figure 4.1 Hydrology 2008 Regional Monitoring Stations

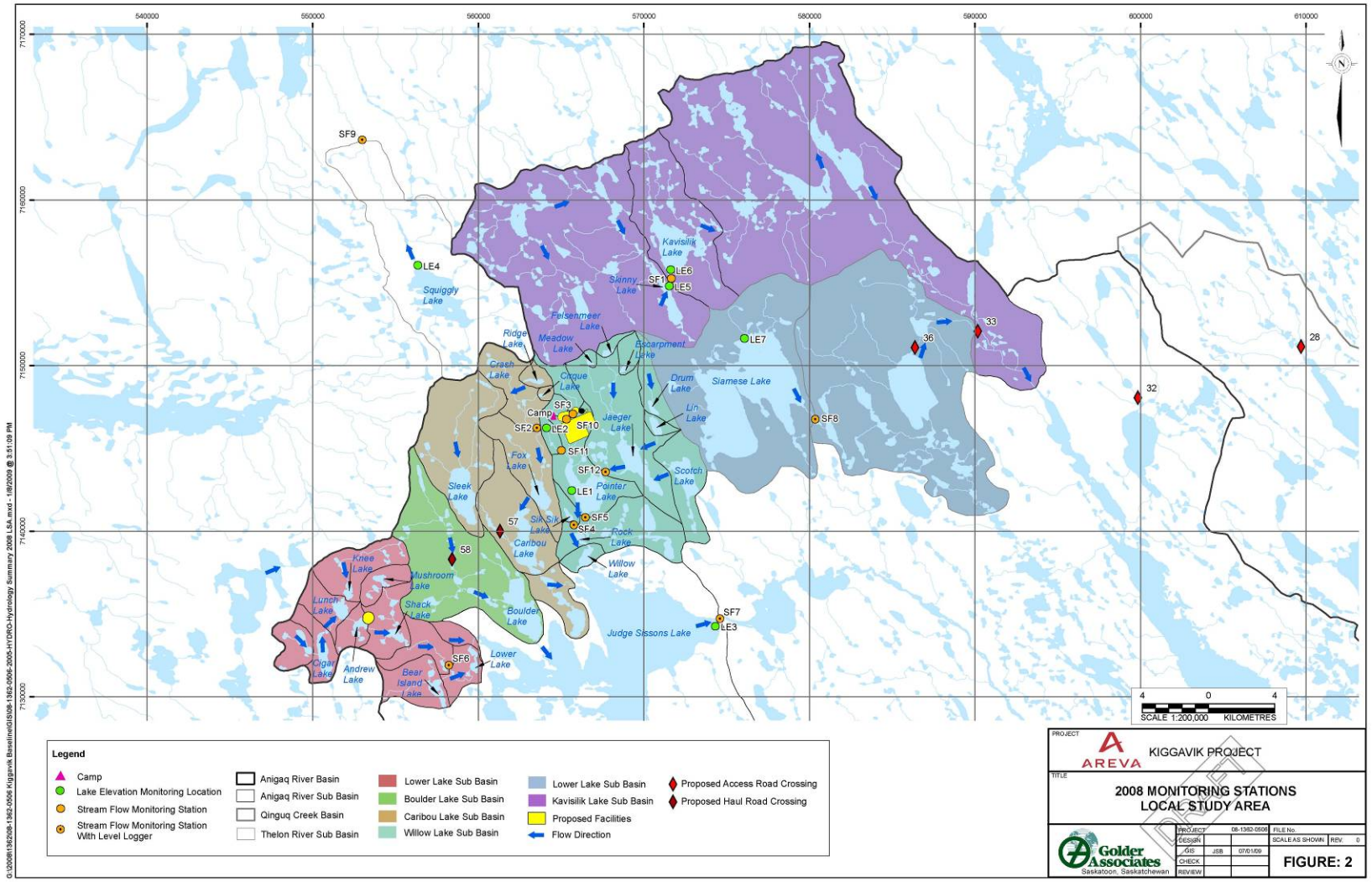

Figure 4.2 Hydrology 2008 Local Monitoring Stations