Developer's Assessment Report

on

North American General Resources Corporation

Early Stage Mineral Exploration Program

near Wool Bay

Land Use Permit Application MV2003C0008

Submitted to:

Mackenzie Valley Environmental Impact Review Board
Yellowknife, NT

Prepared by:

Consultant

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August 12, 2003

SUMMARY

North American General Resource Corp. (NAGR) has a 70% interest in the WBL 1 mineral claim which has a kimberlite-like geophysical signature.

The Company would like to conduct a first pass small winter exploration sampling program on the claim to determine its merits. The program would involve 2-3 angled 2" diameter core drill holes each approximately 150 metres deep proximal to an island 250 metres off the shore of Great Slave Lake, some 1.5km southeast of Wool Bay proper. Although the duration of the program is expected to be less than 10 days, the program would be conducted sometime between late January and late April 2004. An ice road is expected to be installed to Drybones Bay by other explorers that would provide the majority of the access for crews and equipment. A small (300 – 400m) ice road spur would be ploughed from the main ice road to access the Wool Bay work area. The program would be supported from Yellowknife with crews commuting daily by 4x4 pick-up truck to the work area, so no camp is necessary. Fuel would be transported daily in a Tidy tank on the back of one pick-up truck. Garbage, core and drill cuttings would be removed daily from the work area. The entire drill program would be limited to an area of approximately 200m x 200m on the ice of Great Slave Lake. Each individual drill site would temporarily impact an ice surface of under 10m x 10m.

The Company has proceeded and will continue to proceed in good faith. The Company has made extensive efforts to contact and consult with First Nations representatives regarding access and the proposed drilling program. All work would be conducted in a professional manner in accordance with existing legislation and guidelines. Consultants experienced in northern exploration and aware of the sensitivities in the north would be involved in the program.

Conducting the drilling program during the winter and at the exposed offshore locations on Great Slave Lake in conjunction with the brief duration (<10 days) of the program are the main mitigating measures to accommodate spiritual, cultural, fish and wildlife concerns. No archaeological sites would be compromised. As a result of the short term, highly localized, relatively innocuous and readily reversible nature of this proposed drilling program, no significant environmental or cultural effects are expected to occur.

INDEPENDENT EXPERT REVIEW FORM

I have reviewed this report for scientific content and find the report to be acceptable given the specific purposes of this project. The report is objective and shows a considerable level of effort, information and research relative to the scale of the undertaking by scoping out and mitigating concerns.

Reviewer- Richard A. W. Hoos, MSc., R.P. Bio

August 12, 2003
Date

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1.0 INTRODUCTION

This report has been prepared in support of North American General Resources Corporation's (NAGR) efforts to obtain Land Use Permit Application MV2003C0008 and is submitted to the Mackenzie Valley Environmental Impact Review Board due to the referral made by the Mackenzie Valley Land and Water Board in their preliminary screening. The exploration program was referred due to concerns expressed by the Yellowknives Dene First Nation regarding "cultural, social and traditional land use importance of the Drybones Bay and Wool Bay Areas and expressed concern over cumulative impacts resulting from increased mineral exploration".

This report complies fully with the Terms of Reference and Work Plan prescribed by the Mackenzie Valley Environmental Impact Review Board for the site specific Developer's Assessment Report. Concurrently, the MVEIRB has initiated the preparation of an independent cumulative effects assessment for all proposed exploration activities in the Drybones Bay area. The results will be made available in the form of a report that will be provided to NAGR and all other parties to the review process in late August. We look forward to participating in this study as and when appropriate leading to the resolution of any cumulative effects concerns or issues that may be identified.

Table 1: Conformity Table

Terms of Reference	Developer's Assessment Report
A-1	Preceding Table of Contents
A-2	This Table
	Section 1.0
B-1 thru B-4	Sections 2.1 thru 2.4
C-1 thru C-6	Sections 3.1 thru 3.6
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J-1 thru J-3	Sections 10.1 thru 10.4
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	Section 12.0

As the proposed program is a brief Early Stage Mineral Exploration program, this report should be reviewed in that context. To assist the reader two definitions are provided:

Exploration – means any preliminary stage of data gathering in the form of mapping and sampling from surface of rock and soil, or from subsurface by geophysical means or mechanized drill sampling in order to make a new discovery of or conduct a preliminarily evaluate of a mineral commodity. There are various stages of exploration with increased effort. The advancement to subsequent stages is dependent on the success of the

previous stage. The chance of advancing to subsequent exploration stages is highly speculative.

Explorer – means a company, crew or individual employed in the efforts of Exploration.

2.0 DEVELOPER'S BACKGROUND

2.1 Corporate History

NAGR was incorporated on March 14, 2002 under the laws of the state of Nevada. Its principal offices are located at Suite 80 - 8190 King George Highway, Surrey, British Columbia, Canada, V3W 5B7.

The Wool Bay property is the Company's only property asset, a property of merit in order to list on the BBX exchange in the USA. Until the Securities and Exchange Commission approves its request the company remains a private company.

The Company has only made preliminary exploration efforts in the north, that being towards the Wool Bay property. These include a brief geological site visit to the property in July 2002 by an outside consultant, Robert Brown, P.Geo. and a gravity survey conducted by Aurora Geosciences of Yellowknife, neither of which required a Land Use Permit nor caused any surface disturbance. However, Mr. Cowley, P.Geo., Director and Vice President Exploration has worked in the NWT and Nunavut since 1986 with BHP Minerals, Hope Bay Joint Venture and Cumberland Resources Ltd. Mr. Cowley operated as Project Geologist and later Program Manager for BHP from 1986 to 1995 from Yellowknife to the Coronation Gulf. Mr. Cowley was a geological consultant for Hope Bay Joint Venture in the Hope Bay Volcanic Belt east of Umingmaktuk from January 2000 to December 2001 and with Cumberland Resources Ltd. on their Meadowbank project north of Baker Lake from February to December 2002. He has acted respectfully, responsibly and professionally in his duties.

2.2 Ownership

NAGR has a 70% undivided interest in and to the Wool Bay property with 30% held by 4763 NWT Ltd. by virtue of an option agreement. 4763 NWT Ltd. is a company incorporated under the laws of the Northwest Territories owned by Lou Covello and Gary Vivian of Yellowknife. We have formed a joint venture with respect to further work where NAGR holds a 70% interest in the joint venture and 4763 NWT Ltd. holds a 30% interest in the joint venture. NAGR is the operator of the joint venture.

2.3 Organizational Structure

Our executive officers and directors as of March 20, 2003 are as follows:

Name	Office(s) Held
Martin Ermer	Director, President & Treasurer
Paul Cowley	Director & Vice President Exploration
Teresita Ortiz	Secretary
Gurmeet Sidhu	Vice President

Of direct importance to this exploration program at Wool Bay, we provide a profile of Paul Cowley. Mr. Cowley is a professional geologist with 24 years of technical and managerial experience in North and South America. In addition to geological consulting which he has done since March 1997 for companies such as Hope Bay Joint Venture and Cumberland Resources, he is presently Vice President of exploration for Gold City Industries Ltd. a position he has held since May of 2000. From August 1995 through March 1997, Mr. Cowley was country manager of Bolivia for BHP Minerals. From March 1980 through August 1995 he was a senior geologist for BHP Minerals exploring in western and northern Canada and Chile.

Mr. Cowley will be responsible for technical planning, supervising and decision making for the proposed exploration program. It is his intent to be on site as much as possible to ensure proper environmental and safety procedures are followed. Lou Covello and Gary Vivian of Yellowknife who may provide periodic consulting services have been working in the NWT since 1970 and 1976, respectively, with good local hiring records including from the community of Dettah.

2.4 Environmental Performance Record

The Company initiated a brief geological site visit to the property in July 2002 by an outside consultant, Robert Brown, P.Geo. and a gravity survey conducted by Aurora Geosciences of Yellowknife, neither of which required a Land Use permit or caused any surface disturbance.

Mr. Cowley responsible for technical planning, supervising and decision making for the proposed exploration program maintains an excellent environmental record, having worked in the North since 1986 on NWT and Nunavut projects in strict accordance with all regulatory permits and authorizations issued for the specific work programs. It is his intent to be on site as much as possible to ensure proper environmental and safety procedures are followed. He has acted respectfully, responsibly and professionally in his duties and has encouraged local hires wherever technically possible.

The drill contractor has not been selected as yet. Reputable companies such as Connors Drilling Ltd. and Major Drilling Ltd. will be asked to quote on the short contract. Both companies have many years of effective and successful performance in the north. Mr. Cowley has worked with both in his career.

Lou Covello and Gary Vivian of Aurora Geosciences in Yellowknife, may provide periodic consulting services to the program. They have been working in the NWT since 1970 and 1976 and have maintained good environmental records on all projects undertaken in the NWT and Nunavut.

3.0 PROPOSED EXPLORATION PROGRAM DESCRIPTION

3.1 Timing

The exploration program is timed to take place during the winter period when effects on the environment can be most effectively minimized. The diamond drill program is planned between late January and late April 2004 depending on ice conditions and

winter road access installation. The program is expected to be completed in less than 10 days.

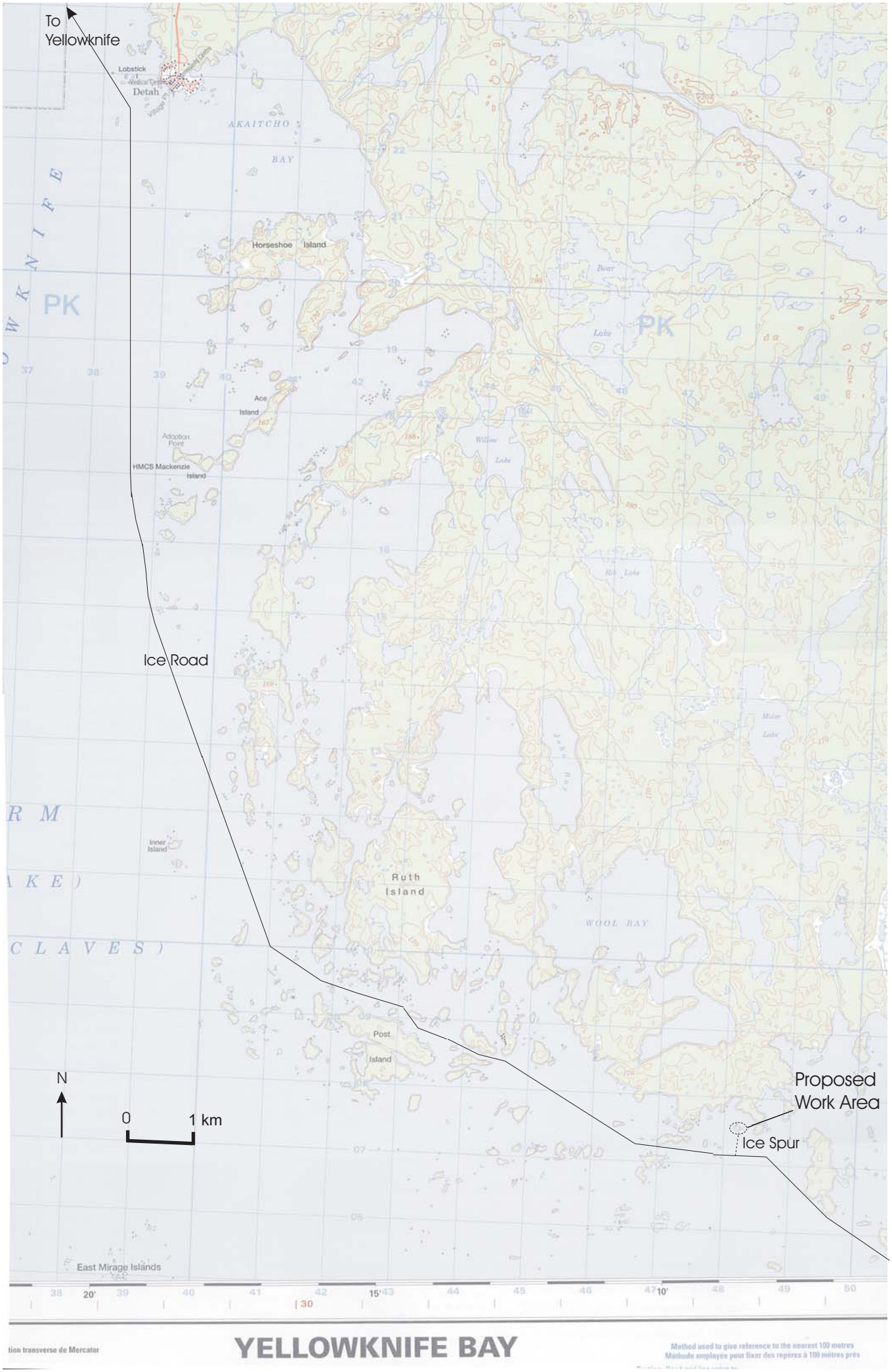
3.2 Location and Access

The Wool Bay property located on Map Sheet 085J/8 is centred on 62^{o} 16' 11" N latitude and 114^{o} 08' 43" W longitude. The work area is located approximately 24 km southeast of Yellowknife and 18 km southeast of Dettah, NWT. The drilling is planned to occur offshore of a small unnamed island located 250 m off the main shoreline of Great Slave Lake (see Figures 1 and 2).

The main exploration winter ice road that was ploughed in the winter of 2002/2003 to provide access to the explorers of the Drybones area is anticipated to be reactivated by those explorers again during the winter of 2003/2004. NAGR plans to access it's offshore drilling work area by ploughing a 300 – 400 m long spur from the main ice road. All temporary access routes will be constructed in accordance with existing guidelines for the construction, maintenance and closure of winter road in the Northwest Territories. Air support by helicopter or fixed wing is not anticipated to be required for this program.

The temporary winter access road would only be open during the relatively short (<10 days) duration of the program. Experience has shown that without constant ploughing any ice road covers over in a couple of days of windy conditions. The ice road would naturally disappear when the ice melts. Most people would have the same access with a skidoo anytime regardless of an ice road.

The program will be conducted exclusively on lake ice in an area of 200m x 200m centred around a small unnamed island, approximately 250m offshore of any area that might provide significant wildlife or wildlife habitat values, medicinal plant or berry growth, traditional burial sites or campgrounds. Since the drilling program will occur offshore, the land will not be disturbed during the implementation of the work program.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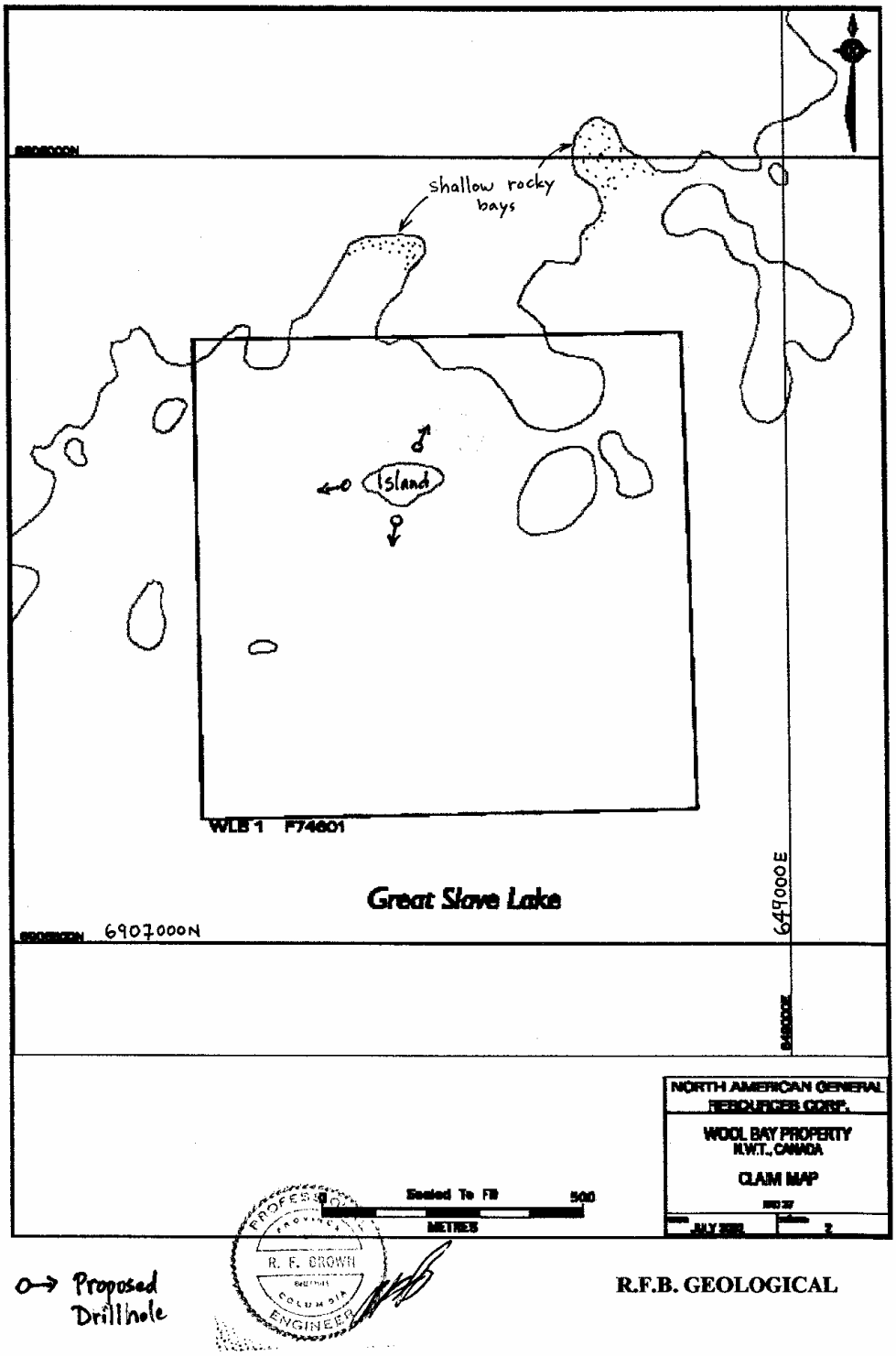


Figure 2: Proposed Drill Area

Segmented Panoramic photo of Wool Bay Property, April 2003, looking west towards island (island is shared in left and center photo)

Wool Bay Property, April 2003, looking southeast from Great Slave Lake shoreline towards island (center right)

3.3 Operations

The short-term and highly localized nature of the program will require only limited on-site personnel at any time. NAGR envisions that the exploration drilling program will be completed in less than 10 days. Diamond drill contactor personnel will be limited to two shifts per day with each crew limited to 2 people. NAGR consultants will be limited to Paul Cowley, VP Exploration and one other geologist. Mr. Cowley would be present as a project supervisor/observer, monitoring drill contractor performance for waste, water and

fuel management and for geological control. The second geologist would conduct daily drill site visits but would be predominantly based in Yellowknife logging core.

As this is an early phase exploration project, the program is not yet at a stage where significant economic benefits or opportunities exist. A new discovery will have to be made first. With continued discussions with local communities and technical successes NAGR will endeavour to build respect, relationships and understandings with local communities so that many may benefit over the longer term.

The following table details the equipment required for the program.

Table 2: Equipment Needed

Type & number	Size	Proposed Use
1-BBS-25A or equivalent	25,000 pounds	2-3 diamond drill holes
2- 4x4 pick-up trucks	¾ ton	Access between YK and work site
1- skidder	240 Timberjack, 21,000 pounds	Providing mobility to rig

It is anticipated that trips to and from Yellowknife and the work area, would be limited to 3-4 trips per day; one trip per drill shift by drillers and 1-2 trips by geologists with core. Travel will generally be by 4x4 pick-up truck.

3.4 Waste Management

Operations are planned during the winter period when environmental impacts can be most effectively minimized. Travel routes and drill sites will be limited to the lake ice surface and as a result will not disturb the land or any associated biophysical and cultural resources. Drilling will be conducted on the lake ice around a small unnamed island in Great Slave Lake. Drill cuttings (waste) produced during the drilling procedure will be collected by the Poly-drill system, an established practice accepted by regulators in the NWT. The system operates by collecting the return (water and drill cuttings) at the drill collar and filters out the particulate material into sausage-like bags for removal. The cleaner water is recycled and reused for drilling in the drilling process for about 1.5 days in this closed re-circulating system. Since the drilling program is located so close to Yellowknife, NAGR intends to transport the rock cuttings bags to Yellowknife daily by pick-up truck and for deposition in the local land fill. It is expected that between 0.2 and 0.5 m^3 of drill cuttings will be produced and disposed of daily.

Proposed disposal methods.

a) Garbage: Removed from site daily
b) Sewage (Sanitary & Grey Water): N/A
c) Brush & trees: no disturbance
d) Overburden (Organic soils, waste material, etc.): Drill cuttings will be collected by the Polydrill system and removed from site.

No surface disturbance is envisioned to require restoration as the program is ice based and all equipment, core and garbage will be removed from the site on completion. No evidence will remain once thawed, as access and drilling will be on ice.

The following table details the fuels needed to accomplish the program. Note that no fuel will be stored on site other than within Tidy tanks on the back of pick-up trucks brought in daily.

Table 3: Fuels Needed

Fuels	Amount	Number of containers	Capacity of containers	Location
Diesel	500 gal	1- Tidy tank	100 gal	Brought in daily on truck
Propane	3000lb	3 tanks daily	100 lb tanks	Brought in daily and removed daily

Enviro-mats would be present on site and placed under any fuel transfer areas. Used mats would be removed daily. Drill pans and spill kits would be present and personnel would be trained in the use of the kits. An electric pump and hose would be used to transfer fuel from the Tidy tank on the back of the pick-up truck to the rig.

A detailed fuel spill contingency plan which will be posted on site at the time of the drilling is provided in Appendix I.

3.5 Water Use

Minimal water would be drawn from Great Slave Lake to conduct drilling. The closed system procedure will ensure that no drill chemicals, fuel or wastes associated with the proposed project will enter Great Slave Lake. The drill procedure will draw about 500 gallons of water into a holding tank. This water will be pumped down the drill pipe to cool the drill bit and free up cuttings generated during the drilling. The drill return carrying particulate rock material will be captured at the drill collar and filtered through the Polydrill system. The drill cuttings will be contained in cuttings bags prior to transport to Yellowknife for disposal at the landfill site.

Drill water will be re-circulated into the 500 gallon holding tank and reused. After about 1.5 days the re-circulated water would be pumped to a localized natural depression on land at least 30m from the shoreline. This water will freeze and during spring thaw will gradually evaporate or disperse naturally. Any suspended solids entrained in the water will settle in place producing a light dust coating in the depression. The natural sump will be located in such a manner that its contents cannot directly enter Great Slave Lake or any other nearby waterbody. The volume of water during each purge will be approximately 500 gallons. The material pumped would contain minimal rock cuttings, water and biodegradable Polydrill polymers (550X which have similar features to ingredients that go into MacDonalds milk shakes). These polymers have been previously approved for use in the NWT by Environment Canada and the Department of Fisheries and Oceans.

This procedure has been an approved and established procedure for many years in the NWT. The application of this closed operating system will eliminate the need for a direct discharge to the lake. The net water used for the entire exploration drilling program is estimated at 3,000 gallons. This volume of water use is below current water licence thresholds. The location of the natural depression receiving the used water will be selected following further consultations on the known cultural and heritage resources of the area.

For background on the effects of drilling on the ice we provide the following summary extracted from the West Kitikmeot Slave Study website entitled **Investigation of Aquatic Impacts of On-Ice Exploratory Diamond Drilling by Ann Wilson of Environment Canada 1997-2000.** This study examined the effects of direct drill effluent released to the lake, a procedure that NAGR is not proposing to employ during its exploration program.

> *"This project looked at the effects of diamond drilling through the ice on water quality, sediment quality and lake bottom organisms. This information is needed by both industry and regulating agencies responsible for granting mineral exploration permits or water licenses. Short drilling holes, like those examined, are typical of first stage mineral exploration drilling; the results are relevant to much of the drilling activity in the Slave Geological Province.*
>
> *Parameters measured included water cloudiness caused when diamond drilling disturbs lake bottom sediments and releases rock particles into the water, and the thickness of material deposited. Sediment samples were analyzed for changes in sediment chemistry and particle size. Lake bottom organisms were identified and counted before and after drilling.*
>
> *The study examined three drilling sites. Two of the sites were non-kimberlite: Baton Lake (near Colomac Mine), and Great Slave Lake in Yellowknife Bay near Yellowknife. Lac de Gras (Diavik Diamond Mines) was a kimberlite drilling site, and had different results.*
>
> *At Baton Lake, approximately one cubic metre of rock fines were released (a typical amount for normal exploratory drilling) forming a layer up to 7mm thick at the discharge point. Sampling one year after drilling waste release showed that the fines layer had been covered with a 10-20mm layer of organic materials which had been recolonized by bottom organisms; there was no significant change in numbers of individuals for the two major taxa (groups or families of animals), though the number of taxa at each hole decreased from four to an average of 2.4. Sediment chemistry showed a slight but not significant increase in aluminum and magnesium after drilling. Water quality measurements were the same as before drilling.*
>
> *Great Slave Lake drilling had little effect on water quality; all measurements were the same as before drilling took place. Sediments settled to the bottom quickly, forming a thin coating of less than 1mm in the area of effluent discharge. There were significantly fewer bottom dwelling organisms at the drilling discharge point but no significant difference 15 metres away, indicating that impacts were localized.*

Findings at Lac de Gras were somewhat different, as drilling through kimberlite produced a more toxic effluent. Effluent chemistry at Lac de Gras showed levels of aluminum and magnesium high enough to be toxic to fish (at the time of drilling). There was a significant drop in numbers of bottom organisms shortly after drilling but numbers had recovered a year later: the number of taxa actually increased, possibly because of a boost in micronutrients resulting from the deposition of sediments.

In a laboratory experiment involving aquaria, organisms from Great Slave Lake were covered with 1, 3, and 7mm layers of drilling wastes, as would happen during drilling. Impacts were not significant. Only a few organisms died; most remained in their own layer, or constructed new burrows.

The study concluded that release of drilling effluent produces temporary and localized effects. For shallow, non-kimberlite drilling targets, diamond drilling through ice does not cause extensive physical or chemical disruption; there was no significant addition of toxic material to the lake bottom, and no significant effect on bottom dwelling organisms. However, the researcher recommended that release of kimberlite-associated drilling effluent not be permitted unless prior testing establishes that the effluent is not toxic to fish."

Wool Bay Property, July 2002, standing on Great Slave Lake shore looking east

The photograph above illustrates the environment or habitat of the NAGR work area. As can be seen from the photo and from descriptions by Robert Brown, P.Geo., who walked the shoreline, the bulk (>80%) of the Great Slave Lake and unnamed island shoreline in

this area is rock outcrop that drops off moderate to steeply into the water (whaleback-like). Small Craft Charts of the area show water depths north of the island of between 1-2 m and south of the island 3-6 m. Two shallow rocky bays are found 400 m north and 800 m northeast of the island. There are no creeks or rivers in the immediate area. The nearest creek is 3 km to the northeast. While Mr. Brown was walking the shoreline he did not see any raptor nests or beaver dams, nor were any raptors disturbed by his presence. Trees in the area are stunted, not lending themselves to the tall trees needed for raptor nesting. No wildlife was encountered during his property visit in July 2003.

3.6 Future Development

Preliminary exploration programs, as implied, represent one of the earliest stages of a typical mining project development cycle. As a result, the possible outcome of the drilling program is highly speculative and the interpretation completely unknown at this time. Therefore no future development plans are associated with this exploration program. If success were encountered, a number of additional years of confirmatory exploration drilling and bulk sampling would be required in order to determine whether a commercially viable mining development could be established.

4.0 EFFECTS OF THE ENVIRONMENT ON THE DEVELOPMENT

4.1 Timing

Operations are planned during the winter period when environmental impacts can be most effectively minimized. The diamond drill program is planned between late January and late April 2004 depending on ice conditions and winter road access installation. Since the work and access to the work is dependent on stable ice support for vehicles and drill rig an adequate thickness of ice is required. The ice road can normally be installed in January. A thickness of 1m is generally accepted as a safety norm. During this period wind and snow conditions can result in temporary suspension of operations until it is safe to operate and roads reopened by ploughing. Should inadequate ice conditions not materialize then the program would not progress, however, this is extremely unlikely due to normal winter conditions for the area.

4.2 Operations

Operations are planned during the winter period when environmental impacts can be most effectively minimized. The diamond drill program is planned between late January and late April 2004 depending on ice conditions and winter road access installation. Since the work and access to the work is dependent on stable ice support for vehicles and drill rig an adequate thickness of ice is required. The ice road can normally be installed in January. A thickness of 1m is generally accepted as a safety norm. During this period wind and snow conditions can result in temporary suspension of operations until it is safe to operate and roads reopened by ploughing. Should inadequate ice conditions not materialize then the program would not progress, however, this is extremely unlikely due to normal winter conditions for the area.

5.0 ALTERNATIVES

5.1 Drilling Season

The drilling program could be conducted during either summer or winter. However, the most cost effective drill testing and access can be achieved during the winter using the lake ice as a stable platform for surface transportation and the drill program. Summer drilling could conceivably be done by barge and supported by helicopter but would be cost prohibitive at this stage. A considerably greater number of environmental concerns would need to be addressed for a summer program. Operations are planned during the winter period when environmental impacts can be most effectively minimized.

5.1 Waste Management

Diamond drilling requires water to cool drill bits and in the process generates rock particles and chips that are pumped from the bottom of the hole to the drill collar located at the surface. During diamond drilling on land, this discharge is generally directed into a natural depression on the land in the immediate vicinity of the drill hole. For diamond drilling on frozen lake ice, companies typically recover and remove drill cuttings off the ice and deposit them into a natural depression on land. (see Ann Wilson's findings above for variances).

Since the drilling proposed in the permit application is on lake ice there are several options.

1) Allow drill cuttings to accumulate on the ice in the vicinity of the hole and allow the rock flour to dissipate into the water as the ice melts. This is not considered to be an acceptable practice.

2) Collect the drill cuttings with the Polydrill system described above and deposit the bags of drill cuttings into a natural depression on the nearby island adjacent to the drill site or somewhere else on the land along Great Slave Lake, thus leaving this benign rock flour material in a confined area on land. NAGR perceives that the local community has some concern with this option.

3) Collect and remove the drill cuttings to the Yellowknife land fill as proposed in the NAGR submission. This alternative, although more costly than option 2, achieves the highest level of environmental protection and is NAGR's preferred approach for handling the drill cuttings.

The same options are available for waste core and garbage handling and disposal. The proposal of removing waste core and garbage from the site to Yellowknife is the environmentally preferable option.

6.0 REGULATORY REGIME

Table 4: Regulatory Regime

Regulatory Authorization Required	Authorizing Authority
Land Use Permit	**Mackenzie Valley Land & Water Board**
Drill Permit- Mines Inspector	**Worker's Compensation Board NWT & Nunavut**
Drilling on Lake Approval	**Department of Fisheries and Oceans**

7.0 PUBLIC CONSULTATION

7.1 Consultation

Below is a table of all NAGR consultations undertaken with the public, Aboriginal organizations, land owners, federal, territorial and municipal governments, and others. The nearest community to the proposed exploration program is Dettah which is located approximately 18 kilometres from the site.

Table 5: Consultation Records

Item	Date	Manner of Consultation	Initiating Party	Contact Person	Outcome
1	Dec 31, 2002	Letter Faxed describing program, asking for access	NAGR	Steven Ellis-Lutselk'e Dene Fist Nation	Successful transmission but NAGR did not receive a response or reaction to letter
2	Dec 31, 2002	Letter Faxed describing program, asking for access	NAGR	Main office-Rae-Edzo Metis National Local #64	Successful transmission but NAGR did not receive a response or reaction to letter
3	Dec 31, 2002	Letter Faxed describing program, asking for access	NAGR	Main office-Rae-Edzo First Nation (Dogrib Rae Band)	Successful transmission but NAGR did not receive a response or reaction to letter
4	Dec 31, 2002	Letter Faxed describing program, asking for access	NAGR	Main office-Yellowknife Dene First	Successful transmission but NAGR did not receive a response or reaction to letter

				Nation (Ndilo)	
5	Dec 31, 2002	Letter Faxed describing program, asking for access	NAGR	Main office-Yellowknife Dene First Nation (Dettah)	Successful transmission but NAGR did not receive a response or reaction to letter
6	Dec 31, 2002	Letter Faxed describing program, asking for access	NAGR	Chris Paci-Dene Nation	Successful transmission but NAGR did not receive a response or reaction to letter
7	Dec 31, 2002	Letter Faxed describing program, asking for access	NAGR	Bob Turner-North Slave Metis Alliance	Successful transmission but NAGR did not receive a response or reaction to letter
8	Dec 31, 2002	Letter Faxed describing program, asking for access	NAGR	Jolene Huskey-Dogrib Treaty 11	Successful transmission but NAGR did not receive a response or reaction to letter
9	Jan 21, 2003	Phone call	NAGR	Steven Ellis-Lutselk'e Dene Fist Nation	Not available, talked to Ann Kendrick who said Howard Townsend will be new contact, call back Jan 27
10	Jan 21, 2003	Phone call	NAGR	Bob Turner-North Slave Metis Alliance	Left message to call NAGR, no response to request
11	Jan 21, 2003	Phone call	NAGR	Jolene Huskey-Dogrib Treaty 11	Talked to Jolene who said she would review the Dec 31 faxed letter and call back, no later response
12	Jan 21, 2003	Phone call	NAGR	Rachel Crapeau-Yellowknife Dene First Nation (Ndilo)	Left message to call NAGR, no response to request
13	Jan 21, 2003	Phone call	NAGR	Main office-Yellowknife Dene First Nation (Dettah)	Secretary said that Rachel Crapeau looks after Dettah and Ndilo land use issues, left message, no later response
14	Jan 21, 2003	Phone call	NAGR	Stephen Conway-Rae-Edzo First Nation (Dogrib Rae Band)	Secretary said Stephen will be in tomorrow, call then
15	Jan 21, 2003	Phone call	NAGR	Yellowknife Metis National	Phone number out of service

				Local #66	
16	Jan 27, 2003	Phone call	NAGR	Bob Turner-North Slave Metis Alliance	Left message to call NAGR, no response to request
17	Jan 27, 2003	Phone call	NAGR	Jolene Huskey-Dogrib Treaty 11	Jolene had reviewed Dec 31 letter but had no decision, an internal meeting was scheduled for Feb 11 to discuss, no later response given
18	Jan 27, 2003	Phone call	NAGR	Rachel Crapeau-Yellowknife Dene First Nation (Ndilo)	Left message to call NAGR, no response to request
19	Jan 27, 2003	Phone call	NAGR	Chris Paci-Dene Nation	Left message to call NAGR, no response to request
20	Jan 27, 2003	Phone call	NAGR	Main office-Rae-Edzo First Nation (Dogrib Rae Band)	Secretary said Stephen wasn't in charge anymore but Nancy, left message to call NAGR, no response to request
21	Jan 27, 2003	Phone call	NAGR	Yellowknife Metis National Local #66	Number given by NWTel was not correct
22	Feb 5,2003	Faxed map	NAGR	Rachel Crapeau-Yellowknife Dene First Nation (Ndilo)	Send scale map detailing work area requested by Rachael to her office
23	Feb 7, 2003	Phone call	NAGR	Bob Turner-North Slave Metis Alliance	Bob said no problem with the program, just update them
24	Feb 7, 2003	Phone call	NAGR	Chris Paci-Dene Nation	Left message to call NAGR, no response to request
25	Feb 7, 2003	Phone call	NAGR	Main office-Rae-Edzo First Nation (Dogrib Rae Band)	Secretary said Chief Edi Paw Labisca was out, call Monday
26	Feb 7, 2003	Phone call	NAGR	Howard Townsend-Lutselk'e Dene Fist Nation	Left message to call NAGR, no response to request

27	Feb 7, 2003	Phone call	NAGR	Rachel Crapeau-Yellowknife Dene First Nation (Ndilo)	Left message to call NAGR, no response to request
28	Feb 7, 2003	Phone call	NAGR	Garth-Rae-Edzo-Metis National Local #64	Left message to call NAGR, no response to request
29	Feb 10, 2003	Phone call	NAGR	Chris Paci-Dene Nation	Left message to call NAGR, no response to request
30	Feb 10, 2003	Phone call	NAGR	Subchief Clifford Daniels-Rae-Edzo First Nation (Dogrib Rae Band)	Subchief Daniels said he would review the faxed letter and call me back, later that day he called and said the program seemed ok for him but needs input from regional person Jolene Huskey
31	Feb 10, 2003	Phone call	NAGR	Rachel Crapeau-Yellowknife Dene First Nation (Ndilo)	Left message to call NAGR, no response to request
32	Feb 10, 2003	Phone call	NAGR	Main office-Rae-Edzo-Metis National Local #64	Left message to call NAGR, no response to request
33	Feb 10, 2003	Phone call	NAGR	Howard Townsend-Lutselk'e Dene Fist Nation	Howard said he would respond within a week
34	Feb 11, 2003	Phone call	NAGR	Chris Paci-Dene Nation	Left message to call NAGR, no response to request
35	Feb 11, 2003	Phone call	NAGR	Rachel Crapeau-Yellowknife Dene First Nation (Ndilo)	Left message to call NAGR, no response to request
36	Feb 11, 2003	Phone call	NAGR	Garth-Rae-Edzo-Metis National Local #64	Left message to call NAGR, no response to request

37	Feb 11, 2003	Expresspost	NAGR	Mackenzie Valley Land and Water Board	Sent Land Use application
38	Feb 12, 2003	Phone call	Garth-Rae-Edzo Metis National Local #64	NAGR	Garth, the band's legal representative, called and gave me his fax number to send original Dec 31 letter for his review, no follow-up response
39	Feb 13, 2003	Phone call	Chris Paci-Dene Nation	NAGR	Returned NAGR call, his opinion was that the YK Dene Dettah would not want development, should contact Rachael or Chief Edjericon for their input
40	Feb 17, 2003	Letter	Mackenzie Valley Land and Water Board	NAGR	Stephen Mathyk requested additional information for application
41	Mar 10, 2003	Fax	Chief Edjericon-Yellowknife Dene First Nation (Dettah)	NAGR	Invitation for April 2, 2003 community consultation at Dettah
42	Mar 14, 2003	Letter	NAGR	Mackenzie Valley Land and Water Board	NAGR responded to MVLWB-Stephen Mathyk with requested information
43	Mar 18, 2003	Fax	NAGR	Chief Edjericon-Yellowknife Dene First Nation (Dettah)	Letter thanking for the invitation and that Mr. Cowley would attend
44	Mar 21, 2003	Letter	Mackenzie Valley Land and Water Board	NAGR	Land Use Permit MV2003C0008 will be reviewed and a decision with be provided 42 days after March 21, 2003
45	April 2, 2003	1 on 1 meeting	NAGR	Malcolm Robb Mineral development DIAND	Discussed the community meeting to see what issues could be brought up and be prepared for.
46	April 2, 2003	1 on 1 meeting	NAGR	Tom Andrews-Prince of Wales Heritage	NAGR identified the area it was interested in and requested info on known archaeological sites. Old Fort Reliance was the only site known in the area but a more

					comprehensive search is required by internet.
47	April 2, 2003	Dettah Meeting		NAGR	Five exploration companies explained their programs including Mr. Cowley representing NAGR followed by the community responding with concerns and historical mining issues
48	April 7, 2003	Fax	NAGR	Rachel Crapeau-Yellowknife Dene First Nation (Ndilo)	Letter thanking for the April 2 meeting and the exchange of information and views
49	April 7, 2003	Fax	NAGR	Chief Richard Edjericon-Yellowknife Dene First Nation (Dettah)	Letter thanking for the April 2 meeting and the exchange of information and views
50	April 7, 2003	Fax	NAGR	Chief Darrell Beaulieu-YK Dene First Nation (Ndilo)	Letter thanking for the April 2 meeting and the exchange of information and views
51	April 7, 2003	Fax	NAGR	Chief Archie Catholique-Lutselk'e Dene First Nation	Letter thanking for the April 2 meeting and the exchange of information and views
52	Apr 11, 2003	Fax	Ron Bujold-Environment Canada	Mackenzie Valley Land and Water Board	Letter responding to program stating 6 conditions to proceed, all standard items
53	Apr 15, 2003	Fax	Chief Richard Edjericon-Yellowknife Dene First Nation (Dettah)	Mackenzie Valley Land and Water Board	Community stated concerns to Drybones Bay and Wool Bay programs
54	Apr 28, 2003	Fax	Mackenzie Valley Land and Water Board	NAGR	MVLWB refers Land Use Application to Mackenzie Valley Environmental Impact Review Board for environmental assessment
55	June 9, 2003	Meeting-YK			NAGR met with representatives of MVEIRB for exchange of

					information, procedure and protocol
56	July 14, 2003	Phone call	NAGR	Rachel Crapeau-Yellowknife Dene First Nation (Ndilo)	Left message to call NAGR seeking community information, no response to request.
57	July 15, 2003	Phone call	NAGR	Rachel Crapeau-Yellowknife Dene First Nation (Ndilo)	Left message to call NAGR seeking community information, no response to request.
58	July 15, 2003	Fax and Expresspost letter	NAGR	Dana Lampi-Prince of Wales Northern Heritage Centre	NAGR identified the area it was interested in and requested info on known archaeological sites. Followed by a response July 16, 2003 that no sites are known within 1 km of work area, map sent by e-mail July 22, 2003 to cover 5km radius
59	July 16, 2003	Phone call	NAGR	Rachel Crapeau-Yellowknife Dene First Nation (Ndilo)	Left message to call NAGR seeking community information; Rachel returned message; NAGR asked if she would share the community map of multi-purpose sites in the area so as to incorporate the information into this report, she refused, saying the information will be available in their community report.
60	July 18, 2003	Phone call & e-mail	NAGR	George Low-DFO Hay River	Requested summary info on fish harvesting industry and species info, habitat
61	July 18, 2003	Phone call	NAGR	Malcolm Robb-DIAND YK	General discussions on experience of drilling on Great Slave Lake.
62	July 18- 23, 2003	Phone calls and e-mails	NAGR	George Low-DFO	General discussions and info on fishing and species in Great Slave Lake.
63	July 23, 2003	Phone call	NAGR	Gordon Stewart & Wayne Johnson-Gardner Lee	Called to provide opportunity for interview related to Cumulative report, Wayne called back, conducted his interview.

64	July 24, 2003	Phone call	NAGR	Ann Wilson-Environment Canada	General discussions on study on effects of ice drilling
65	July 24, 2003	E-mail	NAGR	Tom Andrews-PWNHC	Sent draft segment of DAR regarding Heritage sites to Tom for review on presentation formatting; Tom responded with an approval of material

Copies of letters listed above are provided in Appendix II.

7.2 Issues Resolution

Below is a summary table of all issues raised, their resolution and any outstanding issues. Concerns to date from First Nations have not been site specific. The table shows there are no outstanding issues. All concerns can be mitigated. A cross-referencing is given to the portion of the development description where issues are explicitly addressed.

Table 6: Issues Resolution

Issue	Resolution	Outstanding Issue	Section
Culturally vital: many residents grew up and spent summers in the area and continue to actively use area.	Issue as stated indicates predominantly a summer concern and usage; program conducted in winter would be confined to an area of 200m x 200m exclusively on ice and 250m offshore and would not have had normal human activity: therefore, spatially, program area does not conflict with referenced area of concern, timing of program does not conflict with any summer activities in the area, and the program duration is so short that any winter recreation activities would not be compromised. No remnant impact to area affecting continued use.	None	Sec. 3.1-3.3, 11.0
Spiritually Significant (uncertain if concern pertains to Wool Bay or Drybones Bay)	Program would be conducted in winter and confined to an area of 200m x 200m exclusively on ice and 250m offshore and would not have had normal human activity. Access to work area would be along ice road. Therefore, spatially, program area is small and would not conflict with referenced area of concern; no archaeological sites were identified by Prince of Wales North Heritage Center within 1 km of the work area but 1 site lies about 3km from the work area; local community sources have not provided any information as yet but should information be provided we will ensure that all sites will be respected and avoided. No remnant impact to area.	None	Sec. 3.1-3.3, 11.0

Numerous grave sites at the bay and along shoreline (uncertain if this pertains to Drybones Bay only)	Program would be conducted in winter and confined to an area of 200m x 200m exclusively on ice and 250m offshore and would not have had normal human activity. Access to work area would be along ice road. Therefore, spatially, program area is small and would not conflict with referenced area of concern; no archaeological sites were identified by Prince of Wales North Heritage Center within 1 km of the work area but 1 site lies about 3km from the work area; local community sources have not provided any information as yet but should information be provided we will ensure that all sites will be respected and avoided. No remnant impact to area.	None	Sec 11.0
Actively used for hunting	Program would be conducted in winter and confined to an area of 200m x 200m exclusively on ice and 250m offshore in an exposed area that would not provide any significant habitat for wildlife. Furthermore, program duration is short to minimize any negligible impact on hunting. No remnant impact to area or future hunting.	None	Sec 3.5, 3.6,Sec 10.4.3
Actively used for fishing	Program would be conducted in winter and confined to an area of 200m x 200m exclusively on ice. Temporary localized noise disturbance in area. Drill cuttings will be removed to minimize impact and used water would be pumped on shore. Program would not have any significant impact beyond negligible temporary and local disturbance to fish. Fish harvesting by local business is 5km away from site and is not active during winter months. No remnant impact to area or future fishing.	None	
Historical village at Wool Bay	Program would be conducted in winter and confined to an area of 200m x 200m exclusively on ice and 250m offshore and would not have had normal human activity. Access to work area would be along ice road. Therefore, spatially, program area is small and would not conflict with referenced area of concern; no archaeological sites were identified by Prince of Wales North Heritage Center within 1 km of the work area but 1 site lies about 3km from the work area; local community sources have not provided any information as yet but should information be provided we will ensure that all sites will be respected and avoided.	None	Sec 11.0
Actively used for trapping	Program would be conducted in winter and confined to an area of 200m x 200m exclusively on ice and 250m offshore in an exposed area that would not provide any significant habitat for wildlife. No trapping occurs on the lake ice. No remnant impact to area or future trapping.	None	Sec 10.4.3
Actively used for berry picking	Program conducted in winter would be confined to an area of 200m x 200m exclusively on ice and 250m offshore. Therefore, spatially, the program area does not conflict with berry harvesting; timing of program does not conflict with any summer berry harvesting activities in the region. No remnant impact to area or future berry picking.	None	Sec. 3.1-3.3
Site of Bald eagles (raptors) (not sure if this pertains to Wool Bay)	Program area is 250m offshore of Great Slave Lake, centered on whale-back shaped and treed island, site visit by author in July 2002 and April 2003 did not identify nesting area on island or shoreline. Duration of program and not conducted during spring/summer nesting period. Bald eagles not present at time of program due to migration south. No remnant impact to area or eagles.	None	Sec 10.4.2

Actively used for camping and campground areas	Issue as stated indicates predominantly a summer concern and usage; program conducted in winter would be confined to an area of 200m x 200m on ice and 250m offshore that would not draw normal camping activity. Therefore, spatially, program area does not conflict with referenced area of concern, timing of program does not conflict with any summer activities in the area, and the program duration is so short that any negligible winter camping activities would not be compromised. No remnant impact to area or future camping activities.	None	Sec. 3.1-3.3, 11.0
Actively used for goose hunting	Program conducted in winter and exclusively on ice so no perceivable conflict with geese that are absent from the area at this time of year. Nearest marshland that could provide spring/summer habitat is at least 800m northeast of work area on the other side of a projecting peninsula of land. No remnant impact that would affect future summer goose hunting.	None	Sec 10.4.2
Actively used for duck hunting	Program conducted in winter and exclusively on ice so no perceivable conflict with ducks that are absent from the area at this time of year. Nearest marshland that could provide spring/summer habitat is at least 800m northeast of work area on the other side of a projecting peninsula of land. No remnant impact that would affect future summer duck hunting.	None	Sec 10.4.2
Ecologically unique because they are the largest bays on the shoreline and provide a unique microclimate and unique ecosystem.	Program not in Wool Bay proper; Program would be conducted in winter and confined to an area of 200m x 200m exclusively on ice and 250m offshore and does not provide any significant habitat for wildlife. Program conducted in winter, of short duration and on ice so no perceivable conflict. No remnant impact to area.	None	Sec. 3.1-3.3, 11.0
Unique habitat makes it excellent for wildlife	Program would be conducted in winter and confined to an area of 200m x 200m exclusively on ice and 250m offshore and does not provide any significant habitat for wildlife. Program conducted in winter, of short duration and on ice so no perceivable conflict. No remnant impact to area for future wildlife use.	None	Sec 10.4
Sheltered bays are regularly used during lake travel (impact current use and activity patterns)	Ice road built by and for exploration companies and their program, traffic use would be minimal, 3-4 trips per day; Wool Bay proper is not the location of the program, no spatial overlapping conflict; for the short duration of program drill rig and traffic could potentially be a benefit to other users caught in bad weather conditions. Access route would not conflict with skidoo usage.	None	Sec. 3.1-3.3, 11.0
Good places for picking medicinal plants (not sure this pertains to Wool Bay)	Program conducted in winter would be confined to an area of 200m x 200m exclusively on ice and 250m offshore. Therefore, spatially, program area does not conflict with medicinal plant harvesting; timing of program does not conflict with any summer medicinal plant harvesting activities in the region. No remnant impact to area or future medicinal plant habitat or harvesting. No spatial overlapping conflict seen.	None	Sec. 3.1-3.3

Main boat moorage on Windy days	Program would be conducted in winter so there would not be any boating conflict; program not in Wool Bay proper. No overlapping conflict occurs.	None	Sec.3.1-3.3
Wool Bay birth place of many current residents of Dettah and Ndilo	Program would be conducted in winter and confined to an area of 200m x 200m exclusively on ice and 250m offshore and would not have had normal human activity. Access to work area would be along ice road. Therefore, spatially, program area is small and would not conflict with referenced area of concern; no archaeological sites were identified by Prince of Wales North Heritage Center within 1 km of the work area but 1 site lies within 3km of the work area; local community sources have not provided any information as yet but should information be provided we will ensure that all sites will be respected and avoided.	None	Sec 11.0
Significant impact on Treaty rights and alienation of current access to the land	Not an environmental Impact issue.	None	
Forest Resource impact-all trees getting knocked down	Travel and work area would be conducted exclusively on lake ice in an area of 200m x 200m. No cutting of trees needed, no trees impacted.	None	Sec. 3.1-3.3
Sound effects on fish and wildlife for year round sound.	Duration of program would be short to minimize any negligible impact, site does not provide good habitat for wildlife, most wildlife hibernating, migrated or in land during program. Depth of water in area is 1-6 m. The depths of ice development may be right to bottom thus not providing winter fish habitat. Any impact on fish and wildlife would be negligible.	None	Sec 10.4
Improved Access	Winter road would be open only during program. Without constant ploughing ice road covers over in a couple of days of windy conditions. Ice road would naturally disappear when ice melts. Therefore, there is no improved access except for this short duration and is not a normal route for others. Most would have same access with skidoo anytime regardless of program and ice road.	None	Sec 3.2

8.0 ASSESSMENT BOUNDARIES

8.1 Spatial

Because of the geographic position of the proposed program, the work area can be considered isolated with respect to many issues. The shoreline of Great Slave Lake forms a natural boundary for wildlife habitat and most human activities. The diamond drill program would be confined to an area of 200m x 200m centred adjacent to a 100m x 75m unnamed island, 250m offshore in Great Slave Lake. Within that area each drill site would only temporarily impact an area of 10m x 10m indicating how localized the work would be. Therefore, NAGR considers the 200m x 200m work area on Great Slave Lake

to be the appropriate assessment boundaries. However, NAGR does discuss potential impacts to the immediate shoreline and fringe land north of the work area.

8.2 Temporal

Operations are planned during the winter period when environmental impacts can be most effectively minimized. The diamond drill program is planned for a less than 10 day period of time between late January and late April 2004 depending on ice conditions and winter road access installation. Since the work and access to the work is dependent on stable ice support for vehicles and drill rig an adequate thickness of ice is required. The ice road can normally be installed in January. A thickness of 1m is generally accepted as a safety norm. During this period wind and snow conditions can result in temporary suspension of operations until it is safe to operate and roads reopened by ploughing.

Because of weather uncertainties NAGR cannot limit the program any narrower at this point than the January through April weather window. However, the actual drill program will be very short within that period. Thus, NAGR considers the period between January and April to be the temporal boundaries of the assessment. Issues are discussed for that period. However, because NAGR believes there are no perceivable direct and lasting impacts it discusses effects on year round habitat and use in its review.

9.0 SUBSISTENCE AND TRADITIONAL LAND USE

9.1 Compatibility

The general area is used for subsistence or traditional land use such as hunting, trapping, and fishing. However, because the lake shore forms a natural boundary to wildlife habitat and the program located exclusively on ice offshore, wildlife are expected to be scarce in the immediate area work. There would be no impacts to hunting and trapping in the proposed work area. NAGR will cooperate with the community to ensure compatibility.

NAGR requested a copy of the community map of multi-purpose sites in the area so as to incorporate the information into this report, but was unable to gain direct access to the map. The information will apparently be available in a future community generated report.

9.2 Timing

The following table depicts the schedule of subsistence and traditional use within the vicinity of the proposed undertaking. Discussions of any subsistence or traditional land uses, their potential land use conflicts that could occur at the same time as the proposed undertaking and their mitigating measures are found in 9.1.

Activity	January-April	Summer	Fall
Fishing	x	x	x
Hunting Mammals	x	x	x

Hunting Waterfowl		x
Trapping	x	

10.0 FISH AND WILDLIFE RESOURCES

10.1 Local Resources

The following list and material in 10.1 through 10.3 has been generated from the Department of Renewable Resources, Wildlife and Economic Development and the Canadian Wildlife Service websites. The list identifies species that by virtue of their known broad distribution could inhabit the study area. However, no attempt has been made to conduct site specific counts or sightings of any species. The proposed work area is not exceptional in any way as a habitat for fish and wildlife compared to the surrounding region. Therefore, the material regarding general descriptions, distributions and density, behaviour and habitant that has been gleaned from their website applies to this typical site. The information provides scientific background in order to draw realistic and rational conclusions in 10.4 regarding the proposed exploration program's effects on fish and wildlife that may use the area and are a) important to supporting traditional harvesting, or b) may be species at risk.

Table 7: List Fish and Wildlife Potentially in the Proposed Work Area

Kingdom	Species	Important to Supporting Traditional Harvesting	Species at Risk
Fish	Arctic Grayling	x	
	Burbot	x	
	Lake Trout	x	
	Pike	x	
	Walleye	x	
	Whitefish	x	
Birds	Raptors-Hawks		
	Raptors-Bald Eagle		
	Raptors-Osprey		
	Raptors-Northern Harrier		
	Canada Goose	x	

	Duck	x
Mammals	Moose	x
	Caribou	x
	Black Bear	x
	Wolves	x
	Lynx	x
	Marten	x
	Red Fox	x
	Beaver	x

10.2 Description of Fish and Wildlife Potentially in the Proposed Work Area

10.2.1 FISH

Arctic Grayling

The arctic grayling is a beautiful fish, dark blue on the back and purple grey on the sides. A distinctive characteristic is its large, sail-like dorsal fin, which is coloured a blackish blue with violet spots.

Burbot

Burbot has a white, firm flesh and is often said to be tastier than whitefish. Colouring ranges from olive to a medium/ dark brown-greenish shade, and sometimes almost black, depending on the clarity of the water. Mature burbot in the NWT have been known to weigh up to 22 pounds.

Lake Trout

Lake trout are coloured with light spots on a darker background and a light-coloured belly. The background colour may vary from light green or grey to dark green, brown or black. The best trophy recorded was a world record catch from Great Bear Lake weighing 32.5 kg (72 lbs). Many others have come close to this, and 13 to 18 kg (30 to 40 lbs.) fish are common.

Pike

Pike have a long body with a dark green to brown colour along their back. The sides are lighter and marked with 7 to 9 irregular vertical rows of yellow to white, bean-shaped spots. Pike generally run between 2 and 7 kg (5 to 15 lbs.), but quite a few pike weighing 13 to 18 kg (30 to 40 lbs.) have been taken.

Walleye

The walleye is a member of the perch family and has sharp teeth and two dorsal fins on its back, the front one supported by large spines. Walleye are olive-brown flecked with gold, shading to a white belly. The large, silvery eyes are distinctive.

Whitefish

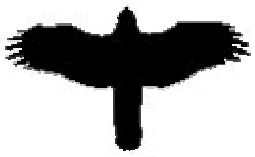
Whitefish is a large and somewhat egg-shaped fish with silver sides that may shade to dark or olive brown. The snout overhangs the lower jaw and has two flaps between the openings of each nostril.

10.2.2 BIRDS

Raptors – General

In the NWT, the birds of prey can be classified into five groups – the woodland hawks or accipiters, the soaring hawks and eagles, the harrier hawks, the osprey, and the falcons. Within in this category, species of hawks, eagles and osprey are detailed below.

Raptors-Hawks



As the name implies, the body structure of woodland hawks or accipters is adapted to forested areas. Their short rounded wings and long tail increase manoeuvrability as they dodge branches while in pursuit of small birds, squirrels or mice. Those hawks will often be seen sitting quietly on an exposed tree limb in the forest waiting to spot a mouse or small bird.

Goshawk

Grey underparts, a light white stripe over the eye and five finger-like wing tip feathers (emarginate primaries) characterize North America's largest accipiter, Goshawk (Accipiter gentilis), (50-60 cm tall).

Sharp-shinned hawk

The only other accipiter of the NWT is the Sharp-shinned hawk (Accipiter striatus), which is distinguished from the goshawk by its rusty, barred breast markings and much smaller size (25-35 cm tall). This hawk has long, slender toes and talons, indicating a diet of predominantly small woodland birds supplemented with small rodents.

Raptors-Bald Eagle

The pure white head, neck and tail of the adult Bald Eagle (Haliaeetus leucocephalos) distinguishes it from all other raptors in the NWT. The immatures are dark brown with varying amounts of white on the head, neck and tail. Bald eagles are similar in size to golden eagles (75-108 cm tall) and also require 4 years to achieve adult plumage.

Raptors-Osprey

Osprey (Pandion haliaetus) are fish-eaters and inhabitants of river and lake country. Their powerful long, narrow, slightly crooked wings can lift them out of the water after having plunged in after a fish. Their feet have spiny scales, long curved talons and a reversible outer toe, all of which increase their ability to hang onto their slippery prey.

Raptors-Northern Harrier

Harriers (Circus cyaneus) are slim-bodied hawks with slim long wings, long tail and long legs. They fly low over open marshlands hoping to flush a small bird or mouse from cover and frequently hover over their quarry before pinning it to the ground.

Formerly known as the “marshhawk,” the northern harrier is the only harrier found in the NWT. Similar in size (46-56 cm tall) to Swainson’s hawk, it can be identified by a distinctive white rump patch. The male is slate grey in colour while the dark brown plumage of the female allows her to remain camouflaged as she sits on her nest, which is located on the ground amongst marshland shrubbery.

Canada Goose

Many people can recognize a Canada Goose by its characteristic black head and crown, long black neck, and whitish cheek patches. However, there are probably more than 40 subpopulations, so a Canada Goose in one region may be quite a different bird from a Canada Goose in another.

Canada Geese range in size and weights from 1.1 to 8 kg and their wingspreads from about 90 cm to 2 m. Their underparts vary in colour from light pearl-grey to chestnut, and even blackish brown. Variations in body proportions, particularly the relative length of the neck, the body shape, and the body stance, further distinguish the different races. In general, the larger the size of the bird, the longer the neck and the more elongated the body; the smaller races have very short necks and compact, almost blocky bodies. However, all the races have whitish cheek patches and a black head, crown, and neck.

Duck

The male Mallard in breeding dress is unmistakable. The glossy head and upper neck are brilliant green, separated from the rich chestnut of the breast by a white collar. The rest of the underparts and the sides are light grey.

The back and wings of the bird are greyish brown, with a purplish-blue speculum, or wing patch, on the wing. The whitish tail has black above and below it. Two central black feathers that curve back above the tail give the breeding male its characteristic curly-tailed appearance. The male has a yellow bill and orange legs and feet.

The female Mallard is a much less colourful bird. Its back is mottled brown, its breast heavily streaked with buff and darker brown. It is best recognized by the white-bordered speculum on the wing, which is similar to that of the male. The female has an orange bill, sometimes blotched with black, and its legs and feet are orange.

10.2.3 MAMMALS

Moose

The moose (Alces alces) is the largest member of the deer family. Bulls (males) average a weight of 500 kilograms, however may weigh as much as 700 to 750 kilograms. Cows (females) are lighter in weight. Both sexes stand about 2 meters at the shoulder. The body is bulky with a short, stubby tail and a disproportionately large head. The long, square muzzle ends with an overhanging upper lip.

Photo credit: GNWT/RWED - C. Gates Cow in autumn

Moose are well-known for their distinctive palmate antlers. Only bulls grow them and the rack is in its prime when the animal is about six years of age. Antlers begin growing in April and reach their maximum size in August or September. Older bulls lose their antlers in December, following the rut, while the younger males may keep theirs as late as February.

Caribou

Adult male barren ground caribou are about 110 cm high at the shoulder. They weigh about 140 kg in the fall when they are in their prime, but only about 100 kg in November after a month of mating activity. Generally, woodland caribou are larger and heavier, while Peary caribou are smaller.

Caribou have long legs ending in large, broad, sharp-edged hooves, which give good support and traction when travelling over snow, ice or muskeg. In winter, the pads between the hooves shrink, and the hair between the toes forms tufts that cover the pads, so the animal walks on the horny rims of its hooves and the hair protects the fleshy pads from contact with the frozen ground. The exceptional warmth of the winter coat is the result of individual hairs which are hollow. The air cells in the hair act as an

Caribou G. Calef

insulating layer to conserve body heat. Barren-ground caribou have the largest antlers in relation to their body size of any deer species and are the only species in which females grow antlers. Antlers are shed and regrown each year.

Black Bear

Black bears (Ursus americanus) are chunky in shape, 1.5 to 1.8 m long and almost 1 m tall at the shoulder. On average, males weigh 115 to 170 kg, while females are smaller at 90 to 155 kg. Black bears have a broad head and short neck. Their eyes are small and black, their ears rounded and the snout long. A short tail is usually obscured by the bear's long coarse hair. Black bear colours range from blond to brown to black. In the Northwest Territories the most common is black, with a tan muzzle and often a white V on the chest. Their eyesight is poor but their senses of hearing and smell are excellent. They can run surprisingly quickly, gathering their feet together underneath themselves and bounding through the trees. They also swim well and are capable of covering distances of 1 km in the water.

Wolves

Wolves of many large arctic islands and Greenland usually appear snow-white from a distance, but closer up often reveal grey, black, or reddish shades. This colour variation is a good example of natural selection, which enables those animals best suited to a particular environment to survive. On the arctic islands, where much of the ground is snow-covered for at least nine months of the year, being white is a distinct advantage, so wolves in the Arctic may be nearly white. Wolves in the Arctic have extremely dense underfur, which insulates them against rigorous winters. Another adaptation to environment is their habit of hunting in packs, or groups, which enables them to kill large animals -- deer, elk, moose, caribou, bison, and muskox.

Lynx

The lynx (Lynx canadensis) is a member of the "felid" or cat family. Lynx are medium-sized animals, with the adults weighing an average of 10 kg for males and 8.5 kg for females. Some distinctive features of lynx are ear tufts, a ruff of fur around the face, a short black-tipped tail, snowshoe-like paws, and long legs. With their broad, well-furred paws, a necessary adaptation for chasing snowshoe hares in deep snow, lynx are particularly well suited to their northern environment. Their fur is a grey-brown mixture with paler grey or brown on the belly, legs, and feet. In late spring, their colour darkens to a reddish brown.

Lynx live in the boreal forest where there are thickets and windfalls.
Photo credit: P. Nicklen

Marten

Marten (Martes americana) are members of the family Mustelidae, which also includes wolverines, weasels and fishers. The marten has many of the characteristics of the weasel family: pointed face, rounded ears, long thin body and short legs. The long, bushy tail is half as long as the rest of the marten's body. Markings above the inner corners of the eyes make the face look inquisitive or expressive. The marten is agile and quick, able to go down trees head first. It is well adapted to northern winters, since it has warm, dense fur and relatively large, well-furred feet which allow it to travel across soft or deep snow. The toes have unsheathed claws that help the marten climb but a protective pad of hair usually hides the claw marks in the tracks.

In the Northwest Territories the winter coat starts growing in mid-October. The winter fur is warm because of the combination of stiff glossy guard hairs that trap pockets of insulating air and fine dense under-fur. The fur thins by March.

Marten Photo credit: P. Nicklen

Red Fox

The red fox (Vulpes vulpes) is a member of the dog family. It has a pointed face and ears and a long, bushy tail. It is larger than the arctic fox and lives in more southern ranges. The red fox is a small animal, weighing 3.0 to 7.0 kg. It is about 100 cm long with its tail accounting for almost half this length. Red foxes are shy, nervous animals, which are most active at night. They have acute hearing and a keen sense of smell. They run with a quick, airy gait, leaving paw prints in a line in the snow.

Beaver

The beaver is the largest rodent in North America and largest in the world except for the capybara of South America. An adult weighs from 16 to 32kg and, including its 30-cm tail, a large beaver may measure 1.3m long.

Very compact and rotund, a beaver walking on land appears to have no neck at all; the round profile of its head merges into the round profile of its back. Because its legs are short, it is ungainly and slow on land. The beaver is a graceful, strong swimmer, both under water and on the surface.

It has many adaptations to its watery habitat. Its small beady eyes are able to see as well in the water as out of it thanks to a specialized transparent membrane that can be drawn over the eye for protection while diving. Its nostrils are small and can be closed for underwater swimming, and its ears too, can be closed under water. The tail of a large beaver may be 30cm long, up to 18cm wide, and 4cm thick. It is covered with leathery scales and sparse, coarse hairs. In the water, the animal can use its tail as a four-way rudder. When diving after being frightened, a beaver slaps the water with its tail which warns all beavers in the vicinity. The beaver's hind feet are very large and fully webbed, for swimming. Its forepaws are small, without webs suited to digging.

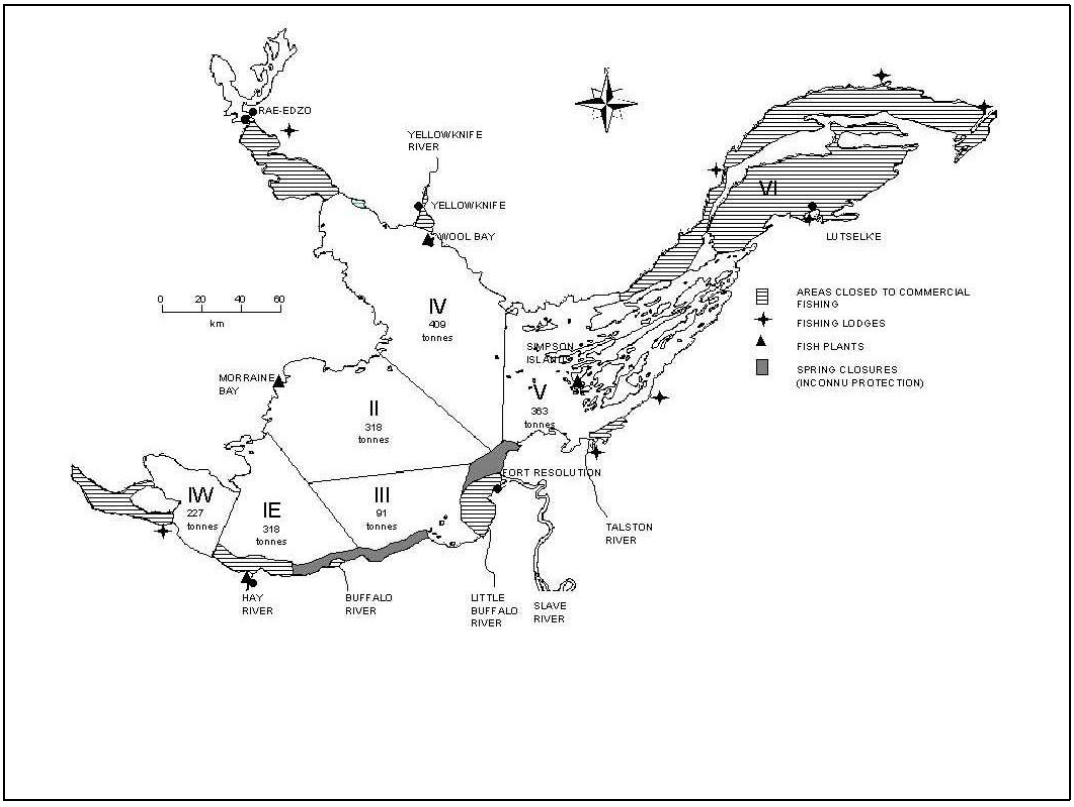
Finally, the animal has exceptional teeth. Its long, sharp, strong incisors grow continuously and are hardened with a dark orange enamel on the forward face.

10.3 Distribution, Habitat and Seasonal Behaviour

10.3.1 FISH AND FISHING

For general distribution of fish species in Great Slave Lake and most specifically near Wool Bay we provided the following references.

In a November 1978 report by **R.W. Moshenko and G. Low: An Experimental Gillnetting Program on Great Slave Lake, 1977**, four gillnetting studies in Great Slave Lake stock assessment were carried out including the Wool Bay area (in the channel between East Mirage Islands and the Drybone Rocks, fishing grounds used by most skiff fishermen out of Wool Bay). Gilnetting produced four species of fish, Lake Cisco (53% by number, 25% by weight), Lake Whitefish (32% by number, 52% by weight), Burbot (10% by number, 20% by weight) and Least Cisco (5% by number, 2% by weight). Similar distributions were found at the Hay River sample site. The study found Lake Trout only from the Moraine Bay, Inconnu at Moraine Bay and Simpson Islands, and Northern Pike, Walleye and Trout Perch only at Simpson Islands.



From a later study by **M.M. Roberge, G. Low and C.J. Read: November 1985, Data From An Experimental Gillnetting Program on Great Slave Lake, 1980-1981**, the following information was gleaned. There are 6 commercial fishing areas of Great Slave Lake as shown above. The Wool Bay area lies within Area IV which produced 409 tonnes of fish the largest catch on the lake. Twenty three sets were made in the Area IV during 1981, more than half between East Mirage and Jackfish Islands. In this test area,

gillnetting produced Lake Cisco (31% by number, 16% by weight), Lake Whitefish (52% by number, 58% by weight), Burbot (5% by number, 15% by weight), Least Cisco (8% by number, 3% by weight), Inconnu (1% by number, 1% by weight), Northern Pike (1% by number, 4% by weight) and Longnose Sucker (2% by number, 3% by weight),

Great Slave Lake commercial fishery is a restricted entry fishery. There are summer and winter certificates for large and small boats and the same in winter for vehicles. There are normally 28 certificates for Summer A (large boat ~4 man crew) and 61 certificates with Summer B (small boats 1 or two man crew) in Great Slave Lake. In the winter there are usually 32 certificates for Winter A (Bombardier type vehicle up to 4 man crew) and 49 certificates for Winter B (skidoos like vehicle 1 or 2 man crew). Fishermen may fish any lake quota anywhere on the lake.

The number of operators who fish in the Wool Bay area (area IV) varies from year to year. Recently there have been about 6 Summer A's and 6 Summer B's fishing the area and in the winter about 6 Winter A's and 8 winter B's fishing the area. They are spread out in the area and move around so by no means are there this many fishermen in outer Yellowknife Bay and Drybones Bay.

The Wool Bay fish plant 4 km west of the proposed work area receives fish during the summer months only June to October. In the winter commercial fishermen who fish the area deliver their fish to the Hay River fish plant.

Arctic Grayling

The grayling is particularly common in the Mackenzie, Coppermine, Anderson, Thelon and Back drainages. Grayling generally inhabit large rivers, rocky creeks and lakes with cold, clear water. During the summer, they can be caught in cold, swift rivers and in bays of some larger lakes. Spawning occurs in the spring in smaller streams with gravel or rock substrates.

Burbot

Burbot is plentiful and wide spread around the NWT. Mature burbot can likely be found in the Mackenzie Delta, and in rivers and larger lakes of the NWT. Younger fish are frequently along rocky shores and sometimes in weedy areas of tributary streams. The Burbot is one of the few freshwater fishes that spawn under the ice in midwinter, from January to March. Burbot spawn in late winter under ice in streams or lake shallows, dispersing their eggs over coarse rubble substrates in water depths from 3 to 5 metres.

Lake Trout

One of the most widely spread fish in the Territories, the lake trout is found throughout the Mackenzie, Thelon, Back and Coppermine drainage systems. Although most angling has occurred on Great Slave and Great Bear Lakes, "lakers" are plentiful and provide spectacular sport in hundreds of fast-flowing rivers and streams. Lake trout spawn in the fall. Spawning takes place primarily over gravelly areas along lakeshores in water depths of 3 to 10 metres. The embryos develop over the winter and hatch during the spring.

Pike

Pike, or jackfish, prefer warm, slow, heavily-vegetated rivers, or warm, weedy bays of lakes. They occur throughout most of mainland Northwest Territories. Pike spawn in the spring after the ice on lakes has melted. They prefer to spawn in heavily vegetated marshes and the shallow bays of large lakes.

Walleye

Also known as doré or pickerel, walleye are plentiful in smaller lakes around Hay River and Yellowknife, and to a lesser extent farther north. Walleye spawn in the early spring or summer. They prefer to spawn in fast-moving water below falls and dams in rivers, or in bouldery or coarse gravel shoal areas in lakes.

Whitefish

The lake, or humpback, whitefish occurs mainly in lakes, although some are taken in larger rivers and some in lakes with brackish waters. The lake whitefish has the widest distribution of all whitefish species in the NWT. The whitefish is mainly a bottom feeder, eating clams, snails, insects and invertebrates. Some may feed on plankton. Spawning occurs in the fall when their eggs are broadly dispersed over gravel or coarse substrates. The fry emerge in the spring. Spawning takes place in the fall on rocky reefs in lakes or the shallows of rivers. The lake whitefish is the most common commercially sold fish found in the Northwest Territories.

10.3.2 BIRDS

Raptors - General

Goshawks, and occasionally golden eagles are year-round residents of the NWT (although varying proportions of their populations also migrate south). Most other raptors are summer visitors.

The number of raptors in the NWT varies annually and this fluctuation is related primarily to prey abundance. Species that rely on a fluctuating prey base include rough-legged hawks and northern harriers (voles and lemmings) and goshawks (snowshoe hares). Raptors that eat mostly birds (peregrine falcons, sharp-shinned hawks) or fish (osprey, bald eagle) and species that hunt a broader variety of prey (Swainson's hawk, red-tailed hawk, gyrfalcon) have much more stable populations.

Summer is breeding season for raptors as well as other birds. Thus, their distribution in the NWT during summer usually coincides with the location of nesting sites. During summer throughout the taiga or forested areas, you can expect to see goshawks, sharp-shinned hawks, red-tailed hawks, Swainson’s hawks, bald eagles, northern harriers, ospreys, and peregrine falcons.

Selection of mates often occurs at a nesting site. The same pair will return year after year to the same nesting area and frequently to the same nest. Hawks, eagles, and ospreys tend to construct bulky stick nests.

The nest site of the diurnal raptors is known as an eyrie. Incubation takes anywhere from 29 days (kestrels) to 44 days (eagles). The young birds are called eyasses and remain in the nest for a minimum of 30 days. The vulnerability of eggs and young birds over such a long time period requires that the eyrie be situated in a location where it is inaccessible or invisible to most predators. It is very important not to disturb raptors at their nest sites. Human activity near a nest site during mating and incubation may cause a nest to be deserted.

During spring and fall, most diurnal birds of prey migrate from and to their wintering areas, which range from southern Canada to southern South America.

Raptors-Hawks- Goshawk

The large, bulky stick nest of goshawks is usually built by the tiercel and located in a tall tree within the forest. The nest may be reused in subsequent years. Two or three eggs are laid in mid-June. The young birds are fed lemmings, squirrels, hares and grouse by both parents and learn to fly when they are 45 days old.

Nest success as well as the distance travelled south every winter seems to reflect prey abundance. During fall, most goshawks leave the NWT and migrate south to over-winter in southern Canada and the USA. Some however remain, making the goshawk one of the few raptor species resident in the NWT throughout the year.

Raptors-Hawks-Sharp Shinned Hawk

Sharp-shinned hawks prefer to build their nests in conifers. Unlike the goshawk, a new stick platform nest is constructed each year. The female lays four to five eggs in late May. The young birds grow rapidly and fledge approximately 23 days after hatching.

As fall approaches, the immature hawks begin the long migration to the wintering grounds in and south of Mexico. The adults follow and, like other raptors, migrate predominantly during daylight hours.

The sharp-shinned hawk is uncommon. Pesticides were responsible for widespread decline of this species between the 1960's and the early 80's. Although this species has not been studied in the NWT, it has likely returned to its former levels of abundance.

Raptors-Bald Eagle

A large stick nest is constructed, usually in a tall tree near water, and used for many years. Two eggs are laid in April. The adults are opportunistic feeders and supply their young a varied diet ranging from fresh fish (caught by the adult or stolen from an osprey or fisherman) to hares and carrion. One or two young are fledged after 77 days in the nest. Bald eagles over-winter in southern Canada and the USA, frequently concentrating in large numbers along spawning salmon

streams. In the NWT, bald eagles frequent the forested lake country.

Photo Credit: Kim Poole

Raptors-Osprey

Osprey are similar to the soaring hawks in size (53-60cm), and in building large stick nests on tops of isolated tall trees, poles or cliff pinnacles near rivers and lakes. Its habit of nesting on power poles has caused power interruptions in the city of Yellowknife. This problem has been countered by the construction of nest platforms on the poles.

Nests are reused in successive years, with three eggs being laid in early June. The adults are tireless fishermen, often diving below the water surface to capture fish. The young fledge after 50 days in the nest, and both immature and mature birds migrate south during fall to overwinter in locations as far south as Peru.

Ospreys appear to be uncommon in the NWT, but have been observed most frequently along the southern portions of the Mackenzie River.

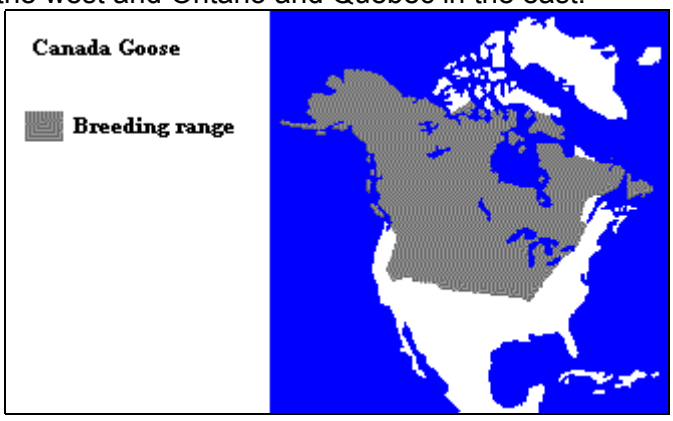
Raptors-Northern Harrier

Northern Harrier build their nests on the ground amongst marshland shrubbery. Four to six eggs are laid in late May. Northern harriers are very sensitive to disturbance and will quickly desert their nests if they are bothered during the incubation period. The adults feed themselves and their offspring small rodents, frogs, birds and insects from the marshes. The eyasses learn to fly once they are 37 days old and precede the mature birds to the wintering grounds throughout southern Canada and the USA.

Canada Goose

In 1950 there were perhaps 1 million Canada Geese; in 1965, 1.5 million. Now there are as many as that in eastern Canada alone, and the continental population, before hunting begins in September, probably exceeds 5 million.

Few species of North American birds are so widely distributed over the continent. The breeding range of the Canada Goose extends in Canada from the Yukon east to Newfoundland, and from southern Victoria Island and southern Baffin Island to the U.S.-Canada border in the west and Ontario and Quebec in the east.



The distribution, size, and life cycle of these races vary according to the climate of their breeding grounds. A goose breeding in the far north must complete nesting, rearing of

young, and moulting in the comparatively short time between spring melt and winter freeze-up.
Geese in the north reach their breeding grounds in late April, several weeks before the break-up of the major rivers. At that time there may still be a considerable depth of snow in the bush.

Most nest sites are located on islands or islets, often close to woody vegetation and usually very close to the water. In some areas nests may be sited on waterlogged sedge-grass muskeg plains at a considerable distance from any sizeable pond or lake.
Usually five to seven eggs are laid, with older birds producing more eggs than birds nesting for the first time. The female incubates the eggs for 28 days. Nesting success is influenced by weather conditions at the start of laying and at the time of hatching. It may also be affected by variations in behaviour related to the density of the population.

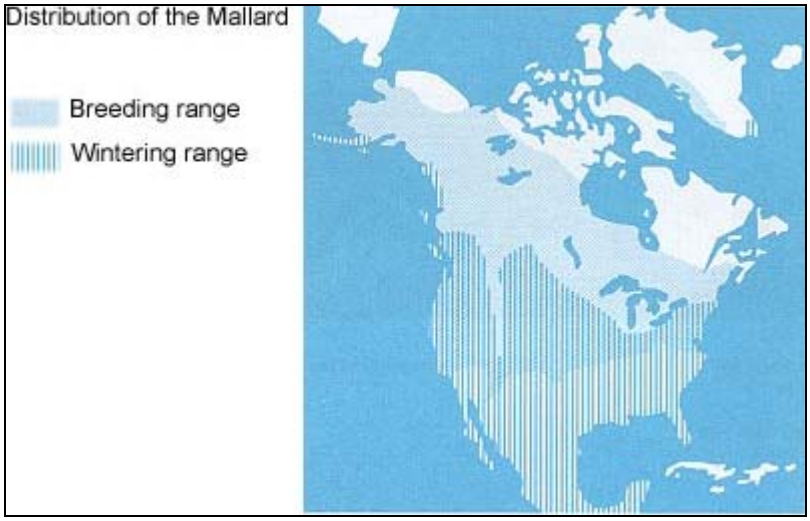
By early August the birds are ready to take to the air as a family unit and by September start their migration south. Some populations of the smallest races that nest in the eastern and central Canadian Arctic travel all the way to the southern United States and north eastern Mexico to spend the winter.

Duck - Mallard

The Mallard is found across Canada. Mallards have also spread north into boreal forest zones in eastern Canada and along the James Bay and Hudson Bay lowlands.

The Mallard is a typical member of the surface-feeding group of ducks, known as the dabblers. It is often seen in the tipped-up position with its tail held vertical. Although the bird can dive in an emergency, it rarely does so.

The food of the Mallard depends on seasonal requirements for egg-laying, moulting, or putting on body fat for migration and winter. Most food material is vegetation or invertebrates procured in the water or on the land. The bird feeds on emergent weeds, roots of plants that grow in shallows, and small swimming invertebrate animals or larval stages of insects that occur in a muddy bottom. On land it often turns to grains.



Mallards are one of the first ducks to arrive back on the breeding grounds in spring. They are adaptable and may nest near a lake, pond, river, or even woodland pool.

The female chooses the nesting site. It may be close by a pond, but is frequently at some distance and may be far from water. Normally on the ground, the nest is little more than a depression lined with bits of rushes, grass or weeds. Up to 15 eggs may be deposited, but the usual number is between 8 and 12. The female does all the incubating, which takes around 28 days.

Mallards may re-nest up to three or four times if their nests are destroyed. Each successive nest will have fewer eggs. However, Mallards do not raise more than a single brood of ducklings each year.

Once on the water, the female leads her brood to feeding areas. The young find their own food, which at first probably consists of small crustaceans, such as water fleas, insects, and tiny plants like duckweed. In about 10 weeks they have assumed a plumage that is much like that of the female. By that time, the female has abandoned them.

In late summer the birds gather in mixed flocks of young and old. Mallards are hardy ducks, wintering regularly in southern Ontario and southern British Columbia. Some will remain as far north as they can find open water. The great majority, however, migrate to the central and southern United States, where lakes and ponds are ice-free throughout the year. The Mallards are essentially freshwater ducks, although some may winter on coastal bays.

The Mallard is famed as a game bird throughout its range. Fast on the wing, it is readily attracted by decoys and its flesh is of excellent quality. Large male Mallards may weigh well over 1.36 kg, but the average weight is around 1.24 kg. No duck is more extensively hunted: in Canada, over 50 percent of all ducks killed are Mallards.

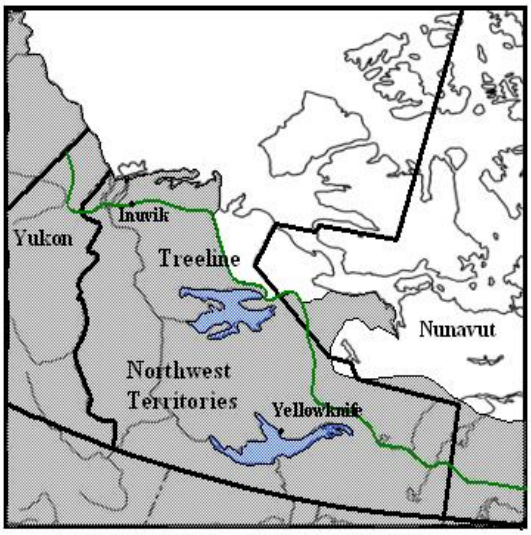
10.3.3 MAMMALS

Moose

In North America, moose range from Alaska to the northern Rocky Mountains in the United States, and eastward to Newfoundland. The extensive boreal forests of Canada

provide the largest moose range in North America. Traditional moose range encompassed suitable habitat south of the treeline throughout the Northwest Territories.

The estimated number of moose in the NWT is approximately 20,000. South of the treeline, moose are widely distributed in the Northwest Territories. However, moose are on the edge of their range in the NWT. Therefore, their density is quite low (3 to 17 moose per 100 km^2) when compared to other areas in North America and Europe.



Grey shaded area – distribution of Moose

A study by **Treseder, L. and R. Graf. 1985: Moose in the Northwest Territories** indicated that although relatively little information is available, it appears that moose populations in the Liard Valley and the Slave River Lowlands are declining. Those in the Mackenzie Delta and the Yellowknife area are subject to high harvesting levels despite their low densities.

In the study by **Case, R. and R. Graf. 1992: A moose survey stratified by using Landsat TM data, north of Great Slave Lake, NWT, November 1989,** a area on the Precambrian shield north of Yellowknife, NWT was stratified using both vegetation maps produced from LANDSAT TM data and from aerial reconnaissance flights. Neither stratification technique was particularly accurate in predicting moose densities. The problems arose mainly from the very low densities of moose in the study area.

Two studies, **Bradley, M. and L. Kearey. 1998: Fort Smith Moose Census, November/December 1996**, and **Bradley, M., L. Kearey and Troy Ellsworth. 1996: Fort Resolution Moose Census November/December 1995**, provide some regional population densities even though they are outside the study area. In the former report, a moose census was conducted in the Southern Slave River Lowlands from Nov 27 to December 4 1996. The study area was 3,151.20 km2. 128 moose were observed yielding a population estimate of 357 moose, and a density of 0.11 moose/ km2. Population size did not differ significantly from a census conducted in 1986. In the later study, a moose census was conducted in the Northern Slave River Lowlands from Nov 27 to December 6, 1995. The study area was 5,986.7 km2. 241 moose were observed yielding a population estimate of 924 moose, and a density of 0.15 moose/ km2. Population size did not differ significantly from a census conducted in 1987/88. No

management activity was deemed to be necessary from both studies, given the consistency in population characteristics.

The best areas for moose are characterized by semi-open forest cover, an abundance of willow and aspen stands, and are located close to lakes, river valleys, stream banks or sand bars. They prefer deciduous shrubs for fall and winter food and thick conifers for winter cover. In the summer they can be found close to river valleys and lakes where they feed on aquatic vegetation.
In addition to hunting, the three major determinants of moose survival are predators, snow conditions and disease. Predation and snow conditions are interrelated factors that can have a significant effect on moose numbers. When snow is deep and moose "yard" together, they are more accessible in greater numbers to wolves. Moose have relatively long legs that allow them travel through deep snow easier than most other ungulates. However, snow depth of over 90 cm greatly hinders their movements and their foraging ability is seriously restricted. Crusted snow can also be detrimental to moose in that it can pierce the skin on the forelegs and crack the hooves, making it vulnerable to predation.

During the rut, in late September and early October, bulls become unpredictable and dangerous.

In late May or early June, the cow moose seeks out a secluded location, often on an island or peninsula, to give birth. A single calf is usually produced by young cows, while mature animals often have twins, and triplets occasionally occur. The calf or calves from the previous year may still be with the cow when the young are born, but she will reject them in order to be alone with her new calves.

Moose are unpredictable in their behaviour. They have excellent senses of hearing and smell, but poor vision. When a moose perceives a threat, it often withdraws silently into the trees and stands quietly until the danger has passed. A startled or frightened moose will crash noisily headlong through the bush. Although ungulates are generally gregarious, moose are solitary animals and do not form permanent groups. The only social bond formed is between mother and calf. In the Northwest Territories where snowfall is generally light, yarding is probably not as important as elsewhere, but small groups are still often seen together.

Moose have always been highly valued in the NWT. Historically, native people relied heavily on them for survival. The huge hides were at one time painstakingly prepared and sewn together to cover large, spruce-frame boats. Moosehide leggings, coats, hats and footwear were necessary apparel to ward off the severe cold. Moose meat was essential to people subsisting in remote areas and the hides were used for tents. A successful hunt was occasion for a feast, and the elders were honoured with the head, which is a delicacy.

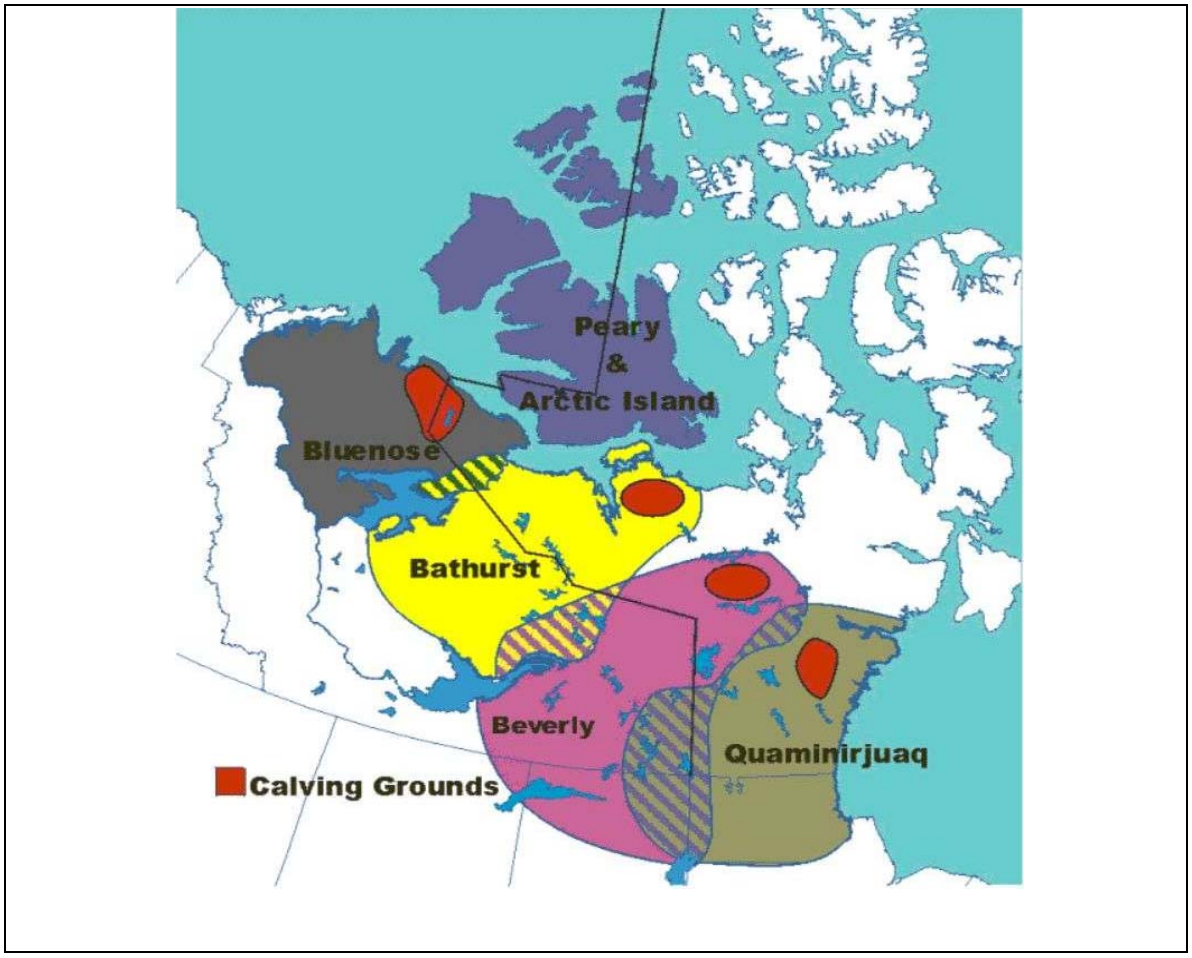
Today, the moose is still an important resource in many NWT communities. With a single animal yielding as much as 300 kg of meat, it continues to be a staple food for many. In addition, the hides are usually home-tanned and used extensively for the making of garments and handicrafts. Most hunters and trappers below the treeline still prefer handmade mukluks to manufactured winter footwear, and moosehide is essential for their soles, as caribou hide is neither thick nor tough enough. Moosehide is also used to make slippers or moccasins, and heavy winter mitts.

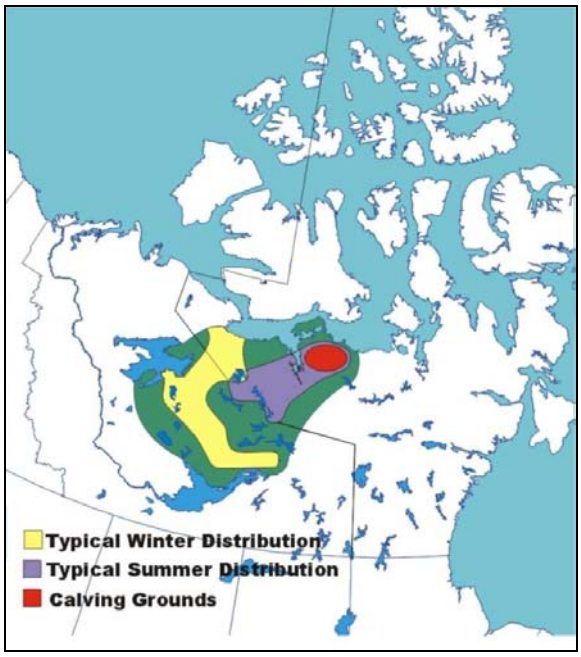
The art of moosehair tufting is reviving with encouragement from local and southern markets, and with the desire to preserve native cultural history. This painstaking art is passed down from mother to daughter. It entails working with the hairs of the moose, plucking, dyeing and sewing them into intricate floral patterns.

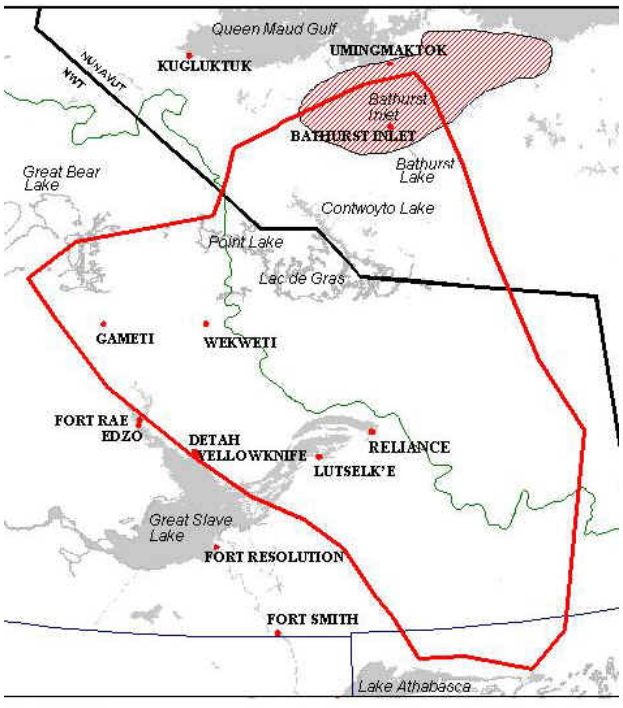
Caribou

Four subspecies of caribou are distributed throughout the Northwest Territories. Barren-ground caribou (*Rangifer tarandus groenlandicus*) have the widest distribution. They range over the taiga forests and tundra of the Northwest Territories' mainland, and Southampton, Coats and Baffin Islands. Barren-ground caribou are by far the most abundant subspecies and have the greatest economic importance. There are an estimated 1.24 million barren-ground caribou in the NWT. Woodland caribou (*Rangifer tarandus caribou*) inhabit the boreal forests of the Mackenzie River valley and the forests and alpine tundra of the Mackenzie Mountains.

Barren-ground caribou herds are usually defined and named after the location of their calving grounds. Four major mainland herds have been identified: the Bluenose herd calves near Bluenose Lake, the Bathurst herd calves near Bathurst Inlet, the Beverly herd calves near Beverly Lake, and the Qamanirjuaq herd calves near Kaminuriak Lake.







Red outlined area - Study area and annual range of the Bathurst caribou herd based on satellite collar data April 1996- December 2000.
Red hatched area - Historical Calving Area 1966- 1996.

NWT barren-ground caribou are migratory. They typically winter within the tree line and may travel more than 500 km to their calving grounds on the tundra. Migration of

pregnant cows begins in March or April followed later by the bulls. As the herd leaves the treeline, the majority of wolves are left behind and predation on the calving grounds is light.

Traditionally, the Bathurst caribou calved east of Bathurst inlet. However, information collected from surveys in 1986, 1990 and 1995 suggested that calving areas were beginning to shift toward the west. In April of 1996, satellite collars were placed on 10 cows, 6 of which remain. These animals are regularly tracked to determine their movements and location. During the 1996 calving ground survey, all collared cows were found west of Bathurst Inlet and when reconnaissance surveys were flown, high densities of calving caribou were found between the Hood and Burnside Rivers west of Bathurst Inlet.

The migration from the calving grounds back to their winter range typically brings the Bathurst herd to the area north of Great Slave Lake, around Wekweti, Wha Ti and Gameti. In some winters they move farther south into areas near Yellowknife and Lutselk'e. In 1997/98 the herd moved even further south, into northern Saskatchewan.

When migrating, they walk at about 7 km/hr, covering between 20 and 65 km a day. Caribou are excellent swimmers. Their hollow hairs enable them to float high in the water and their broad hooves propel them along at speeds of about 3 km/hr. At water crossings, caribou normally select narrow, if not always easy, stretches. However, they can swim for long distances and have been observed crossing parts of Bathurst Inlet which are up to 10 km wide.

Calving grounds appear to be unfavourable spots for the birth of calves. They are often located in high, rocky areas where there is little shelter from high winds or driving snow. Most calves are born during the first two weeks of June when temperatures are usually near the freezing point, much of the ground is still snow covered and new plant growth is minimal. However, the cows have now left most of the wolves behind because they den at the treeline. Throughout spring migration, bulls lag behind the cows. Many do not leave the forest until early June. They leisurely graze their way northward following the retreating snow line, eating the nutritious new leaves sprouting on the sedges and willows.

As soon as calving is over cows and calves slowly begin the first stage of their long trek back toward the winter range. As spring swings into summer the cows meet up with the bulls that have continued to drift north. Once together, they form dense "post-calving aggregations" in an attempt to reduce the intense disturbance caused by mosquitoes, black flies and other insect parasites. Groups are often of overwhelming size, numbering in the tens of thousands or more.

In August and September, high quality food is abundant and there are relatively few bugs. The large herds break into small bands slowly dispersing over the tundra range, and then shifting southward towards the forests. The rut occurs in October and is spectacular in its intensity. By the time they are over, winter has settled on the north and migration into the forest has been completed.

Winter is spent foraging for lichens, the mainstay of the winter diet, but sedges, and evergreen leaves are also eaten. Caribou use their excellent sense of smell to lead them to lichens under the snow, and their broad hooves to dig feeding craters. Their winter

distribution constantly changes, as animals search for places where the food is best and the snow shallowest.

Caribou have always been important to the people of the Northwest Territories. Most Dene, and Metis still rely on caribou as their main source of food, and hides are still used for clothing and to sleep on when camping. Most barren-ground caribou herds are more abundant now than they have been for decades. As caribou numbers have increased, they have increased their winter range with the result that caribou are accessible to more hunters. The Bathurst herd is estimated at 350,000.

Wolf predation and hunting are the largest causes of caribou mortality. Wolf predation can cause substantial caribou mortality and may limit caribou numbers in some areas. However, both caribou and wolves are abundant in the NWT. Adverse weather conditions can also take their toll, especially on the calving grounds and during winter.

The future of barren-ground caribou is bright. Caribou are extremely adaptable with few specific habitat requirements. Hunting, forest fires and wolf predation are all natural events that caribou have coped with for millennia. Caribou will survive increased encroachment by people and industrial developments if they have space. They need space to search for food where the snow is not too deep, space to find relief from insects, and space to avoid predators.

Black Bear

Black bears are widely distributed throughout North America. In the NWT, black bears are found below the treeline. They prefer habitat that combines forested areas, which provide seclusion and safety, with open spaces that provide berries, shrubs and grasses. Black bear densities are typically highest within river valleys and bears are quite common along the Slave, Mackenzie and Liard rivers.

The number of black bears in the NWT is not known. However, the NWT black bear population is thought to be healthy across its entire range. Often bears are observed during studies of other animals such as caribou or moose.

Grey shaded area – distribution of the Black Bear

Black bears are generally solitary animals, each having an individual territory. Home ranges may overlap, but a small core area is usually maintained by each bear as its exclusive domain. The size of the home range is influenced by the availability of food and the number of bears in a locality. In the Northwest Territories, black bears probably have ranges from 75 to 200 square kilometres. Occasionally groups of bears congregate in the same area. Usually that happens because of an exceptionally abundant food supply, as may be found in a dump or campground.

Black bears in the Northwest Territories den earlier and remain in their dens longer than those in the south. With the first frosts in September, bears begin to seek out den sites and are generally in hibernation by October. Suitable sites for bear dens are natural shelters such as overturned trees, piles of branches, crevices, caves or large rocks that a bear can excavate beneath. Black bears undergo a form of hibernation. They emerge from their dens in April. By middle of July, life becomes a non-stop effort to eat, gain weight and store fat for the winter.

Black bears are sexually active during June, July and August, and occasionally as early as May. Females may be sexually mature at 3 to 5 years of age, but some do not mate until age 7. Black bear cubs are born in January or February while the female is still in the den. They usually stay with their mother for the first year and den with her during the next winter. Young bears are extremely vulnerable during their first year alone and mortality is high. Without the protection of their mother, yearlings are susceptible to the attacks of large male bears, and with their lack of foraging experience they are easily attracted by food at dumps and campsites, and may end up being shot as "nuisance bears".

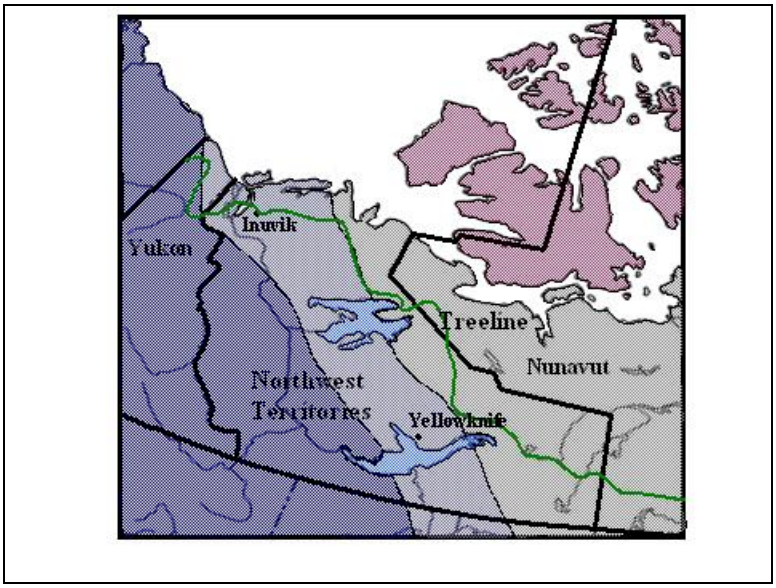
Fewer than 200 black bears are estimated to be harvested in the NWT annually. Although there are no exact figures for the subsistence harvest, fewer than 100 bears are thought to be taken by subsistence harvesters each year. From 1994 to 1997, an annual average of 17 black bear pelts were sold at auction.

Wolves

Wolves were once distributed throughout Canada. In the Northwest Territories, they are still found on most of their traditional range. Although relatively abundant, their exact numbers are unknown. Densities are highest in areas on the mainland where barren-ground caribou winter.

In the Northwest Territories of the three different groups of wolves two inhabit the general study area. Wolves that live below the treeline, that depend mostly on non-migratory prey like moose and bison, and maintain regular territories are commonly known as timber wolves. Wolves that travel above and below the treeline on the mainland of the Northwest Territories, depend largely on barren-ground caribou, and do not maintain regular territories are commonly known as tundra or caribou wolves.

Throughout the winter, wolf packs are on the move, travelling many kilometres, feeding where they find prey and resting when they are tired, or when extreme temperatures and storms cause them to seek refuge. Winter travel routes include game trails, ridges, seismic lines and frozen waterways. In deep fluffy snow, wolves find travelling difficult and any easier route, including roads or snowmobile trails are preferred.



Red shaded area – High Arctic Wolves
Grey shaded area – Tundra Wolves
Blue shaded area – Boreal Wolves
Blue-grey shaded area – overlap

The size of winter range for timber wolves within the treeline varies considerable from area to area, and is largely dependent on prey density. In areas where prey is scarce, a pack would have to range far to locate animals, and fewer packs would be able to thrive there. On a per wolf basis, this varies from 50 km^2 to 120 km^2.

Wolves accompany nearly all caribou herds most of the year. In spring, the caribou herds move to their calving grounds, which are often located in relatively high, bleak and windy areas. The calving grounds are poor sites for denning wolves and therefore the low density of wolves affords the cows and calves some measure of protection at a time when they are very vulnerable to attack. Nevertheless, there are some wolves on the calving grounds that will prey on calves. Caribou calves mature quickly and can soon run with their mothers to escape predation.

In the Northwest Territories wolves mate in late March. The gestation period is 60 to 65 days with litters of four to seven pups born in late May or early June. About 3 weeks before the birth of the pups, the female completes digging her den, which may have been started 2 to 3 weeks before. In many areas wolves will reuse old dens that are in ideal locations and have been used for generations. Most wolf dens are burrows in the ground, usually in sandy soil. Sometimes, rock caves or shallow surface beds are used. If the dens are threatened or disturbed by people or bears they can quickly move the pups to a new location.

Wolf den Photo credit: Doug Heard

When the pups are about 2 months old, the family may leave the den and move to an open grassy plain, an old burn or a marshy area. In this "loafing spot" or "rendezvous", the

wolves feed, rest and play until the pups are old enough to travel.

Wolves are an important and natural part of ecosystems in the Northwest Territories. Wolves are extremely resilient and can usually survive the pressures of hunting and trapping, providing they have sufficient prey. The last wolf control program in the Northwest Territories was in 1977-78. The current policy of the Department of Resources, Wildlife and Economic Development is that there will be no wolf control unless it is clear that a bison, muskox, moose or caribou population is threatened because of wolf predation.

Wolf hunting and trapping is restricted to winter which protects the wolf when it is raising pups or when its fur is not in prime condition. In the past 18 years the total Northwest Territories wolf harvest has usually been 600 to 800 annually. Local hunters and trappers harvest wolves and may sell the hide or use the fur for homemade winter garments such as parka trim and mitts.

Lynx

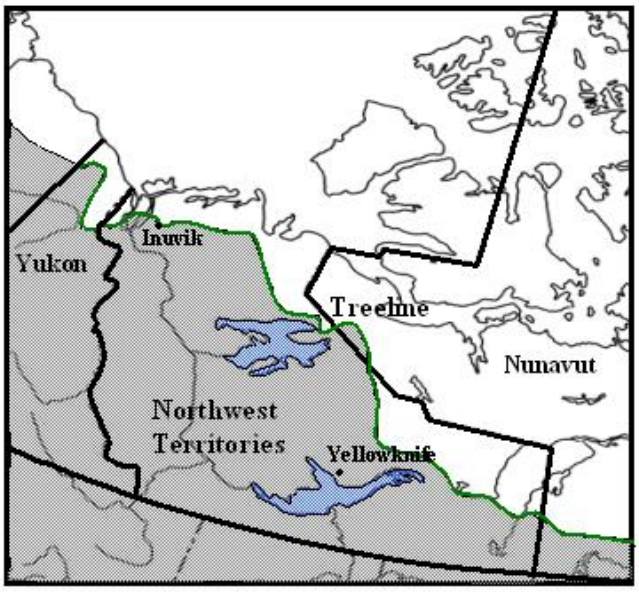
Lynx live in boreal forests across North America. Within the Northwest Territories, lynx are found below the treeline and are most numerous in the southwest and in the Mackenzie Delta. Although other prey is eaten, lynx depend heavily on snowshoe hares to thrive.

The lynx population cycle is closely linked to the snowshoe hare population cycle. Across most of the boreal forest, hare populations experience dramatic fluctuations in a cycle that lasts 8-11 years. At the peak of the cycle, snowshoe hares can reach a density of up to 1500 hares per km^2. The habitat cannot support this many animals, and as predation increases and starvation sets in, the population starts to decline. Continued predation accelerates the hare population decline, since lynx and other predators are at a population high. When the hare population reaches a low level, it stabilizes, for several years. The food plants slowly recover and the hare population starts to increase again. Since hares have several litters each year, the hare population increases rapidly. After a year or two at high densities, the hare cycle repeats itself.

The lynx population decline follows the snowshoe hare population crash after a lag of 1 to 2 years. As hare numbers start to decline, lynx continue to eat well because they easily catch the starving hares. When hares become scarce, the lynx numbers decline as well.

The highs and lows of the lynx population cycle do not occur at the same time across the Northwest Territories. For example, in the early 1990's, lynx numbers peaked two years later in the north-western Northwest Territories than in the south-western Northwest Territories.

Adult lynx are solitary, except during the breeding season and when raising young. Each adult establishes a territory by marking rocks, trees, and stumps with its scent. The territories of lynx of different ages and sex often overlap, but adults of the same sex usually avoid each other. When hunting is good, this territory or "home range" is approximately 15 to 25 km^2. When hares are scarce, lynx may expand this range to double or triple in size, or they may travel great distances in search of food. Lynx have been known to travel over 1000 km.



Grey shaded area – distribution of Lynx

Lynx are found where there are snowshoe hares. Lynx prefer diverse forest with stands of conifer, softwoods, or mature mixed-wood for cover, and shrubby areas for feeding. Old growth forests with little understory are not attractive to either species.

Lynx are good climbers but because of their preference for snowshoe hare they usually hunt on the ground. They are most active during the night and the twilight of dawn and dusk. Their sense of smell is poor, their hearing is good and their eyes are well adapted for hunting in low light.

The short breeding season of the lynx lasts from mid-March through to early April. Lynx become more social than usual during breeding and often make excursions outside of their home range. Gestation lasts about 9 weeks, and a litter of 2 to 5 kittens is born in late May or early June. Their first winter is spent learning to hunt with their mother. At the end of the winter, as the breeding season approaches, the family group breaks up and the young search for their own home ranges.

In the Northwest Territories, the trapping season for lynx is open from November 1 to March 15. Lynx are curious and relatively easy to capture. They follow regular routes and can be caught along them, especially in places such as portages between lakes.

Although the value of lynx pelts varies, the lynx harvest remains important to Northwest Territories fur harvesters located below the treeline. Harvesting lynx, as well as other furbearers, provides a cash income and enables native people to continue a lifestyle that has been a tradition in the North for thousands of years.

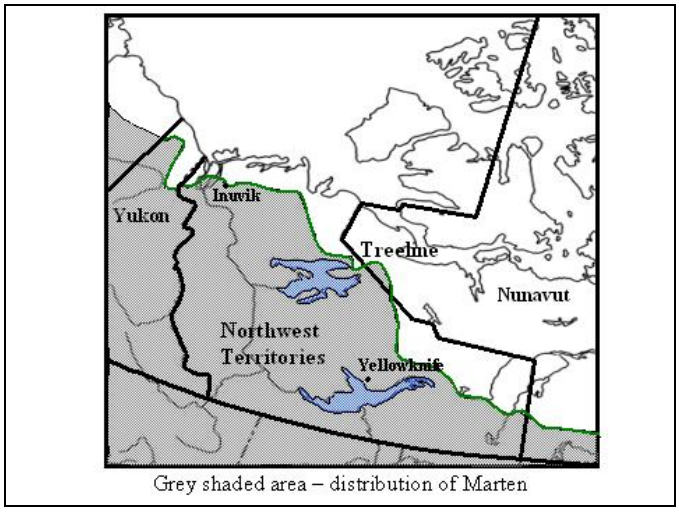
Marten

Marten are found throughout North America as far north as the treeline, in a variety of forest settings. Marten favour mature conifer forests, especially if dominated by spruce and fir, but are found in other forest types if there is enough food and cover. They will use sparse open forests if there is plenty of undergrowth and fallen trees to provide dens, under-snow spaces for winter hunting, and suitable habitat for prey. Generally they

avoid large clearings, although in summer they may use natural clearings or small clear-cuts if sufficient cover exists.

Most marten occupy a specific territory or "home range". The size of the home range depends on its quality. Home range areas vary from 2.5 to 15 km^2 for males, and 1.5 to 5 km^2 for females. Water bodies or tributaries often serve as boundaries. Since marten are wary and secretive, people do not often see them in the bush. However, they can be found close to sites of human activity.

Marten feed on mice, voles, shrews, snowshoe hares, berries, and birds. Their main prey experience population cycles, and marten populations tend to follow these cycles. When food is abundant females can have up to 9 kits. But when food is scarce, only 1 or 2 kits are born.



Grey shaded area – distribution of Marten

Marten must eat regularly to maintain their energy levels since they cannot store much body fat. This is especially important in winter when extra energy is needed to keep warm. To save energy during winter they hunt during the warmest part of the day, often catching larger prey such as snowshoe hares and caching the food for later use, or stay near a kill or carrion site for several days. They do not hunt during extreme weather or storms and often use trails made by other animals.

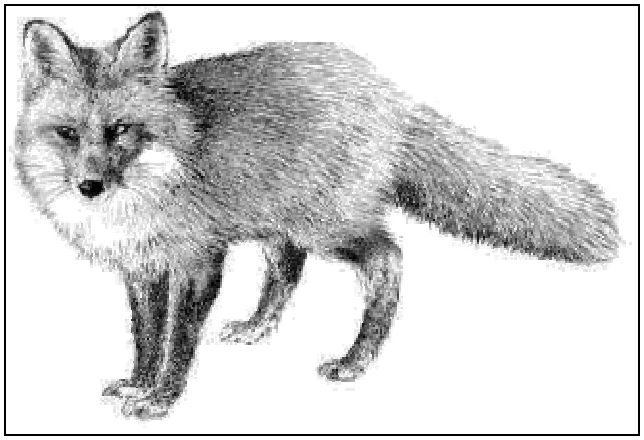
In summer and fall, marten usually hunt at night when mice and voles are most active. Early spring is the most difficult time for them because food is usually scarce after the long winter.

The harvest season for marten in the Northwest Territories is November 1 to early or mid-March, varying slightly by region. This period roughly covers the time that marten fur is prime. By late February or March the fur is past prime. Marten are the single most valuable furbearer in the NWT. They are readily trapped, have relatively restricted home ranges and their pelts can command high prices.

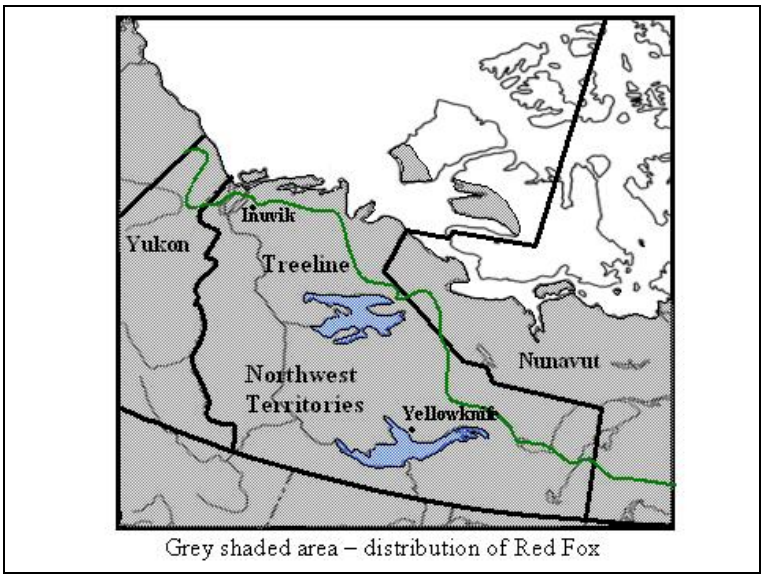
Red Fox

The red fox is the most widely distributed carnivore in the world. It ranges across Canada as far north as some of the arctic islands. Large numbers are distributed below the treeline of the Northwest Territories and they occur sparsely in the southern tundra.

Normal home ranges vary between 5 and 35 km^2. Foxes may undertake long migrations in search of food, especially in years of low prey density and high fox numbers. The wide distribution of red foxes indicates that it is able to survive in a variety of habitats. It is most often found in semi-pen country, such as natural clearings, river valleys, tundra and agricultural areas.



Artist: Rennie Knowlton



Grey shaded area – distribution of Red Fox

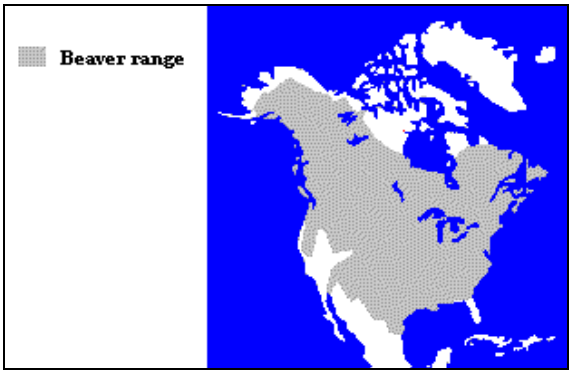
Mating of the red fox occurs in February and March and a den is dug or an existing burrow is found and prepared for habitation. It prefers den sites along riverbanks in sandy soil. These dens are not as complex as those of the arctic fox are, but they are still spacious often using the same den and home ranges year after year.

Red fox pups are born between March and May after a gestation period of 51 to 53 days. About five pups are born in a litter. In August, the young foxes disperse and may travel until mid-winter before they establish their own hunting territory. After 10 months they reach sexual maturity and are able to breed.

Red foxes are harvested as furbearers. Trapping seasons extend generally from early November to late February below the treeline.

Beaver

Beavers are found throughout Canada, north to the mouths of the Mackenzie and Coppermine rivers on the Arctic Ocean. Most common in forested areas, beavers also expand into unforested habitats where there are watercourses bordered by deciduous (broad-leaved) trees or shrubs. Even in the tundra, beavers occasionally colonize shrubby water edges where water is deep enough to allow for food storage and access to the den under the winter ice.



In the study, **Poole, K.G. and B. Croft. 1990: Beaver surveys in the western NWT, September - October 1989**, beaver lodge surveys were conducted by Super Cub in late September and early October, 1989 on 14 blocks in the western Northwest Territories (NWT), to examine long-term trends in beaver populations and identify areas where beaver trapping should be encouraged. A total of 2059 km2 was surveyed. The number of active lodges ranged from 0-1.00 lodges/ km2 (mean of all blocks 0.26 lodges/ km2). These densities are similar to those found in northern boreal habitats elsewhere. Comparisons with surveys conducted in the western NWT over the past 25 years suggest that current densities are moderate to high, and that beaver trapping could be promoted and encouraged in most areas. In order to monitor long-term trends in this potentially valuable resource, the study recommended that the blocks should be resurveyed at 4-year intervals.

Beavers are wonderful builders and what they build depends on where they live. Their best-known structure, the beaver dam, is only built by beavers that need to enlarge the underwater habitat that will be open to them in winter, by creating a pond deep enough that it will not freeze to the bottom. Deep water, whether or not it is due to a beaver dam, provides storage for winter food and a year-round underwater access to the lodge or den secure from predators. Increasing the area of ponds through damming and additional downstream impoundments provides safer access to additional food supplies.

The beaver begins the dam by laying sticks and rocks in the stream bed about where the noise of moving water is greatest. Twigs, stones, and any other movable materials are laid in place in front of and around the initial rows of sticks. Eventually, mud is pushed up from the bottom or carried to the dam to provide a water seal. The result is a very stable earthwork that can withstand great water pressure and erosion by running water. Most lodges are about 5m in diameter and about 2m high. Dams are maintained throughout the year, but the beavers add most material during periods of high water.

A family of five or six beavers may require half a hectare of dense poplar trees for its winter food supply. As trees are cleared away from the edge of the pond, the beavers go farther afield in their logging operation — often 125 m or more from the pond. They cut down trees and shrubs, thus clearing "logging trails" so they can drag heavy sticks overland more easily.

Every fall, beavers in northern latitudes construct food piles to sustain them in winter. Each such cache is an accumulation of the beaver's favourite woody food items placed in deep water close to the lodge or bank den. The bulk of the edible forage in the cache is held below the water surface by a thick top layer of small, leafy branches most often cut from non-preferred trees and shrubs.

One litter, averaging three or four kits, is born each year in May or June following a 100-day gestation period. The young stay with their parents until they are two and sometimes three years old. At that time they disperse in response to an innate urge to leave the home colony.

With the first frosts of September and October, the tempo of beaver life speeds up as the animals harvest their winter food supply. Trees are cut down, gnawed into short lengths, and toted to the pond for underwater storage. All winter the beavers bring sticks from their underwater cache into the feeding chamber of the lodge to gnaw the succulent bark. They prefer trembling aspen, poplar, willow, and birch. They also swim out under the ice and retrieve the thick roots and stems of aquatic plants, such as pond lilies and cattail. During mild winters and during warm days in March and early April, adult beavers emerge from their dull aquatic world to feed on fresh woody stems along the shore. On such forays they often fall prey to hungry wolves.

10.4 Possible Direct and Indirect Impacts and Mitigating Measures

10.4.1 FISH

The shallower depth of water 1-2 m north of the island and the two shallow rocky bays found 400 m north and 800m northeast of the island that would provide fish habitat during summer months would probably be frozen to the bottom at the time of the program thus not providing winter fish habitat. By drilling with a closed system where waste and water are not been directly discharged into Great Slave Lake impacts to bottom organisms, fish and fish habitat would be negligible. Disturbance to the lake bottom would be highly localized (< 1 m^2) very temporary, and 100% reversible.

10.4.2 BIRDS

Raptors-Hawks

During fall, most goshawks leave the NWT and migrate south to over-winter in southern Canada and the USA, however some remain throughout the year. The large, bulky stick nest of goshawks is usually built in a tall tree within the forest. Two or three eggs are laid in mid-June. A site visit in July 2002 did not see nest or raptor during the shoreline walk. No nests were identified along the shoreline during an April 2003 site visit by the author. The timing of the proposed program will not coincide with sensitive times such as nesting. No goshawk habitat will be disturbed as the work area is exclusively on ice. The advantage of the exposed offshore lake location in conjunction with the timing and shortness of the program are the mitigating measures to reduce or avoid impact.

Sharp-shinned hawks migrate from the NWT in the fall to the wintering grounds in and south of Mexico. This species will not be present during the proposed drill program. A site visit in July 2002 did not see nest or raptor during the shoreline walk. No nests were identified along the shoreline during an April 2003 site visit by the author. No sharp-shinned hawk habitat will be disturbed as the work area is exclusively on ice. The advantage of the exposed offshore lake location in conjunction with the timing and shortness of the program are the mitigating measures to reduce or avoid impact.

Raptors-Bald Eagle

Bald eagles over-winter in southern Canada and the USA. This species will not be present during the proposed drill program. In the NWT, bald eagles frequent the forested lake country. A large stick nest is constructed, usually in a tall tree near water, and used for many years. A site visit in July 2002 did not see nest or raptor during the shoreline walk. No nests were identified along the shoreline during an April 2003 site visit by the author. No bald eagle habitat will be disturbed as the work area is exclusively on ice. The advantage of the exposed offshore lake location in conjunction with the timing and shortness of the program are the mitigating measures to reduce or avoid impact.

Raptors-Osprey

Ospreys appear to be uncommon in the NWT, but have been observed most frequently along the southern portions of the Mackenzie River. Osprey migrate south during fall to overwinter in locations as far south as Peru so any osprey would not be present in the proposed work area during the time of the exercise nor would it affect the early June nesting time. They nest in isolated tall trees, however, there were no nests identified along the shoreline during an April 2003 site visit by the author. A site visit in July 2002 did not see nest or raptor during the shoreline walk. No osprey habitat will be disturbed as the work area is exclusively on ice. The advantage of the exposed offshore lake location in conjunction with the timing and shortness of the program are the mitigating measures to reduce or avoid impact.

Raptors-Northern Harrier

Northern Harrier migrate south during fall to overwinter throughout southern Canada and the USA so northern harrier would not be present in the proposed work area during the time of the exercise nor would it affect the late May nesting time. Northern Harrier build

their nests on the ground amongst marshland shrubbery. A site visit in July 2002 did not see nest or raptor during the shoreline walk. The proposed work area does not provide this habitat. Only two small rocky bays with marginal marshlands are located 400m north and 800m northeast of the proposed work area that could provide marginal habitat for these birds. No Northern Harrier habitat will be disturbed as the work area is exclusively on ice. The advantage of the exposed offshore lake location in conjunction with the timing and shortness of the program are the mitigating measures to reduce or avoid impact.

Canada Goose

Canada geese migrate south during fall to overwinter throughout southern Canada and the USA so Canada geese would not be present in the proposed work area during the time of the exercise nor would it affect the late May nesting time. Canada geese build their nests on the ground amongst marshland shrubbery. A site visit in July 2002 did not see nest or geese during the shoreline walk. The proposed work area does not provide this habitat. Only two small rocky bays with marginal marshlands are located 400m north and 800m northeast of the proposed work area that could provide marginal habitat for these birds. No Canada geese habitat will be disturbed as the work area is exclusively on ice. The advantage of the exposed offshore lake location in conjunction with the timing and shortness of the program are the mitigating measures to reduce or avoid impact.

Duck

Ducks migrate south during fall to overwinter throughout southern Canada and the USA so ducks would not be present in the proposed work area during the time of the exercise nor would it affect the late May nesting time. A site visit in July 2002 did not see nest or ducks during the shoreline walk. Ducks build their nests on the ground amongst marshland shrubbery. The proposed work area does not provide this habitat. Only two small rocky bays with marginal marshlands are located 400m north and 800m northeast of the proposed work area that could provide marginal habitat for these birds. No duck habitat will be disturbed as the work area is exclusively on ice. The advantage of the exposed offshore lake location in conjunction with the timing and shortness of the program are the mitigating measures to reduce or avoid impact.

10.4.3 MAMMALS

Moose

The density of moose in the region is low because moose are on the edge of their range and even lower in the vicinity of settlements due to harvesting. Habitat for moose is in forest cover so the exposed nature of the work site offshore within Great Slave Lake does not lend itself except for the most limited moose habitation. A site visit in July 2002 did not see moose during the shoreline walk. No moose were seen on the property during an April 2003 site visit by the author. The timing of the proposed program will not coincide with sensitive times such as rutting and calving. No moose habitat will be disturbed as the work area is exclusively on ice. The advantage of the exposed offshore lake location in conjunction with the timing and shortness of the program are the mitigating measures to reduce or avoid impact.

Caribou

The Bathurst herd is enormous estimated at 350,000. The migration from the calving grounds back to their winter range typically brings the Bathurst herd to the area north of Great Slave Lake from October to April, around Wekweti, Wha Ti and Gameti. In some winters they move farther south into areas near Yellowknife. Winter is spent foraging for lichens, the mainstay of the winter diet, but sedges, and evergreen leaves are also eaten. The exposed nature of the work site offshore within Great Slave Lake does not lend itself except for the most limited caribou habitation as there is no foraging available. No caribou were seen on the property during an April 2003 site visit by the author. The timing of the proposed program will not coincide with sensitive times such as rutting and calving. No caribou habitat will be disturbed as the work area is exclusively on ice. Furthermore, the length of the proposed program is so short as to not unduly interfere with marginal caribou habitat and would not interfere with the periodic and limited traditional harvesting in this area. The advantage of the exposed offshore lake location in conjunction with the timing and shortness of the program are the mitigating measures to reduce or avoid impact.

Black Bear

The NWT black bear population is thought to be healthy across its entire range. In the Northwest Territories, black bears probably have ranges from 75 to 200 square kilometres so potential to interact at the proposed work area is very low. Black bear hibernate between October and April so the timing of the proposed program would not correspond to their active time. A site visit in July 2002 did not see black bear on the property during the shoreline walk. No black bear were seen on the property during an April 2003 site visit by the author. The timing of the proposed program will not coincide with sensitive times such as breeding. The program may coincide with the birthing in the den but due to the low density and low chance of interaction and distance for shore the potential to interfere is very low. No black bear habitat will be disturbed as the work area is exclusively on ice. The advantage of the exposed offshore lake location in conjunction with the timing and shortness of the program are the mitigating measures to reduce or avoid impact.

Wolves

Densities are highest in areas on the mainland where barren-ground caribou winter. On a per wolf basis, this varies from 50 km^2 to 120 km^2 so potential to interact at the proposed work area is very low. Wolves accompany nearly all caribou herds most of the year so much of the discussion related to caribou above applies to wolves. Wolves following the Bathurst herd would be wintering below treeline but not often reach the Yellowknife area. Furthermore, the exposed nature of the work site offshore within Great Slave Lake does not lend itself except for the most limited caribou and wolf habitat. No wolf was seen on the property during an April 2003 site visit by the author. The timing of the proposed program may coincide with wolf mating in late March but the low density makes interaction very low risk. The proposed program would not correspond to denning and birthing. Wolves are extremely resilient and can usually survive the pressures of hunting and trapping, providing they have sufficient prey. No wolf habitat will be disturbed as the proposed work area is exclusively on ice. Furthermore, the length of the proposed program is so short as to not unduly interfere with marginal wolf habitat and would not interfere with the winter traditional hunting and trapping in this area. The

advantage of the exposed offshore lake location in conjunction with the timing and shortness of the program are the mitigating measures to reduce or avoid impact.

Lynx

Adult lynx are solitary, except during the breeding season and when raising young. Each adult establishes a territory which is approximately 15 to 25 km^2 so potential to interact at the proposed work area is low. This is further reduced due to the exposed nature of the work site offshore within Great Slave Lake which does not lend itself to lynx habitation, lacking safety and very limited food source. A site visit in July 2002 did not see lynx on the property during the shoreline walk. No lynx were seen on the property during an April 2003 site visit by the author. Lynx prefer diverse forest with stands of conifer, softwoods, or mature mixed-wood for cover, and shrubby areas for feeding. Old growth forests with little understory are not attractive to either the lynx or snowshoe hare.. No lynx habitat will be disturbed as the proposed work area is exclusively on ice. Furthermore, the length of the proposed program is so short as to not unduly interfere with marginal lynx habitat and would not interfere with the winter traditional hunting and trapping in this area. The advantage of the exposed offshore lake location in conjunction with the timing and shortness of the program are the mitigating measures to reduce or avoid impact.

Marten

Home range areas vary from 2.5 to 15 km^2 for males, and 1.5 to 5 km^2 for females, however, water bodies such as the shores of Great Slave Lake will serve as a boundary to marten habitat. Marten favour mature conifer forests, especially if dominated by spruce and fir and generally avoid large clearings. The exposed nature of the work site offshore within Great Slave Lake does not lend itself to marten habitation, lacking safety and very limited food source. A site visit in July 2002 did not see marten on the property during the shoreline walk. No marten was seen on the property during an April 2003 site visit by the author. Since marten are wary and secretive, people do not often see them in the bush. However, they can be found close to sites of human activity indicating their adaptive nature. No marten habitat will be disturbed as the proposed work area is exclusively on ice. Furthermore, the length of the proposed program is so short as to not unduly interfere with marginal martin habitat and would not interfere with the winter traditional hunting and trapping in this area. The advantage of the exposed offshore lake location in conjunction with the timing and shortness of the program are the mitigating measures to reduce or avoid impact.

Red Fox

Normal home ranges vary between 5 and 35 km^2 so potential to interact at the proposed work area is low. The wide distribution of red foxes indicates that it is able to survive in a variety of habitats. It is most often found in natural clearings, river valleys and agricultural areas. The exposed nature of the work site offshore within Great Slave Lake does not lend itself to red fox habitation, lacking a food source. A site visit in July 2002 did not see red fox on the property during the shoreline walk. No red fox were seen on the property during an April 2003 site visit by the author. No red fox habitat will be disturbed as the proposed work area is exclusively on ice. Furthermore, the length of the proposed program is so short as to not unduly interfere with marginal red fox habitat and would not interfere with the winter traditional hunting and trapping in this area. The

advantage of the exposed offshore lake location in conjunction with the timing and shortness of the program are the mitigating measures to reduce or avoid impact.

Beaver

The generally open configuration of the lake shore, conifer tree cover in the vicinity, the predominantly rocky shores and the moderately deep drop-off to the shoreline does not lend itself to beaver habitat. A site visit in July 2002 did not see beaver or beaver dams during the shoreline walk. No beaver dams were identified along the shoreline during an April 2003 site visit by the author. The exposed nature of the work site offshore within Great Slave Lake does not lend itself to beaver habitation. No beaver habitat will be disturbed as the proposed work area is exclusively on ice. The advantage of the exposed offshore lake location in conjunction with the timing and shortness of the program are the mitigating measures to reduce or avoid impact.

11.0 CULTURAL AND HERITAGE RESOURCES

11.1 Local Resources

NAGR provided the Prince of Wales Northern Heritage Centre with the center coordinates of the exploration program as 62^{o} 16' 11" N latitude and 114^{o} 08' 43" W longitude (island offshore of Great Slave Lake). According to Dana Lampi of the Prince of Wales Northern Heritage Centre, their NWT Archaeological Sites Data Base search found no archaeological sites within 1km of this location. However, the nearest site was found beyond 3km from the proposed work site. This site is known as Old Fort Providence which is an historic North West Company trading post. The NWT Archaeological Sites Data Base is the property of the GNWT.

Not reported in the Prince of Wales database on July 22, 2003 was an erect cross observed by the author during his site visit in April 2003. The location is not provided here to protect the site. Elders in the area will have to comment on its significance. The author has since provided the Prince of Wales Northern Heritage Centre with a photograph and coordinates of this site for their database.

11.2 Direct and Indirect Impacts

The program is planned on ice. There will not be any land based activities. Cultural and heritage sites on land cannot be disturbed if all travel and work are on ice. Crews will not be given details of any locations in the vicinity. Terms will be included in the drill contact for crews to avoid any sites. Mr. Cowley will be on site regularly to monitor and supervise crews. The purged re-circulated water from the drilling will be pumped to a natural depression on land and will avoid any sensitive sites.

Territorial and federal law prohibits development activities within 30m of a known archaeological site. The Company will work with elders in the community of Dettah to ensure no sites are compromised.

12.0 CONCLUSIONS

North American General Resource Corporation would like to conduct a first pass small winter exploration sampling program on its Wool Bay mineral claim to determine its mineral merits. First Nation consultation was attempted prior to a Land Use Application submission. Due to community concerns the application was deferred to the Mackenzie Valley Environmental Impact Review Board for an environmental assessment.

This Developer's Assessment Report describes the company and its supporting consultants. It describes the proposed program's timing, access and methods for water and waste management following accepted and approved exploration practices in the NWT to avoid and minimize potential impacts. It provides a record of the efforts made by the company to consult with First Nations representatives to show respect and to develop an understanding of public concerns that need to be addressed in order to undertake a preliminary winter exploration drilling program in the area. It describes attempts to determine culturally sensitive sites in and around the proposed work area. And, it provides general fish and wildlife descriptions, distributions, densities, seasonal behaviours and habitat in order to demonstrate how the program by virtue of it's timing, briefness and methodology would result in negligible or no impacts on the biological resources that frequent the area during the year or their habitats.

The early stage exploration program is a brief non-intrusive program planned for less than 10 days sometime between late January 2004 and late April 2004. The program, located approximately 24km southeast of Yellowknife and 18km southeast of Dettah would be conducted approximately 250 metres off the shore on the ice of Great Slave Lake during the winter period when environmental impacts can be most effectively minimized. An ice road from Yellowknife would provide access for daily crews and fuels and the removal of wastes, garbage and core. The drill program would be confined to an area of 200m x 200m on the ice of Great Slave Lake. Each drill site would temporarily impact an ice surface area of under 10m x 10m. Water consumption will be minimal in the closed system proposed which would prevent drill cuttings and water from being discharged directly into the lake.

Conducting the drilling program during the winter and at the exposed offshore locations on Great Slave Lake in conjunction with the brief duration (<10 days)of the program are the main mitigating measures to accommodate spiritual, cultural, fish and wildlife concerns. No archaeological sites would be compromised. As a result of the short term, highly localized, relatively innocuous and readily reversible nature of this proposed drilling program, no significant environmental or cultural effects are expected to occur.

The Company has proceeded and will continue to proceed in good faith. The Company has made extensive efforts to contact and consult with First Nations representatives regarding access and the proposed drilling program. All work would be conducted in a professional manner in accordance with existing legislation and guidelines. Consultants experienced in northern exploration and aware of the sensitivities in the north would be involved in the program.

The company respectfully requests that the Mackenzie Valley Environmental Review Board consider the material contained here, the company's efforts and the precautions and mitigating measures built into this preliminary program to justify referring the matter back to the Mackenzie Valley Land and Water Board for issuance of the Land Use Permit.

Appendix I
Spill Contingency Plan
North American General Resources Corporation
Diamond Drilling at Wool Bay

SECTION A:
Background

Period of Operation: Between February and April 2004
Project Description: North American General Resources Corporation wishes to diamond drill on its Wool Bay mineral claim to explore for diamondiferous kimberlite. Drilling would occur during winter ice conditions with the work area based on the ice of Great Slave Lake.
Types of Contaminants: Diesel fuels and vehicle/equipment lubricants will be used at the work site.
Storage of Contaminants: Fuel will not be stored on-site, but will be trucked in from Yellowknife on a daily basis in a tidy tank on the back of a 4x4 pick-up truck.

SECTION B:
Potential Spill Incidents:

1. Refueling of Diamond drill rig and skidder

Incident: Refueling hose could break, fall out of the diesel receptacle, or the tank could be overfilled, thereby spilling fuel on the refueling area.

Consequences: i) Limited area; puddles of fuel.
ii) Hose breaks off at truck, spraying large amounts of fuel over a larger area, slick flows steadily from truck.

Preventative Measure: i) All refueling will occur in designated areas. Crews will be aware of emergency shut-offs.
ii) Site will be stocked with a complement of spill management material. Crews will be trained in the use of these materials.
iii) Equipment will not be left unattended during refueling.
iv) Enviro-mat will be placed at both the tidy tank end and tank receiving end during fueling periods.

SECTION C:
Spill Response Procedures:

The following procedure is to be followed in the event of a spill. Steps are listed in the order of importance; however, depending on circumstances, conditions and potential injuries, this order may need to be altered to meet specific needs.

1. Stop the flow at source:
   Has the flow been stopped or is it still leaking? Is there an emergency shut-off valve? Have holes in the container been patched? Is the container empty? PRECAUTION: ONLY ATTEMPT TO STOP THE FLOW IF IT IS SAFE TO DO SO.

2. Take actions to contain the spill:

Prompt containment can reduce environmental exposure and risk. Containment measures will be snow/ice based. Snow and ice based measures include applications of absorbents, construction of berms and diversion/collection trenches.

3. Disposal of Contaminated Materials:
   All contaminated materials would be contained at an environmentally approved Land Farming site. This site would be approved by governing authorities and monitored by our Department as required.

4. Report Action to NWT Spills 24 hr Hotline, the person reporting the spill shall give as much of the following information as possible:
   - Date and time of spill
   - Direction spill is moving (or if it has stopped)
   - Name and Phone number of persons close to the location of the spill
   - Type of contaminant spilled and quantity spilled
   - Cause of spill
   - Description of the existing contaminant
   - Actions taken to recover, clean-up and dispose of spilled contaminant
   - Name, address and phone number of person reporting the spill
   - Name of person in charge of management or control at time of spill

SECTION D
List of On-Site Spill Containment and Management Equipment

Heavy Equipment	To remove soiled material, construct containment, ditches, etc.
Hand Tools	The same as above
Spill Kit	45 gallon drum of sphagnum absorbents, gloves, disposal containers for immediate removal of contaminated materials.

SECTION E:
Spill Reporting Procedures

Contact Phone Numbers:

NWT 24 hour Spill Report Hotline:	(867) 920-8130
Department of Public Works and Services	
Elsie Larocque, Project Officer	(867) 874-7004
Ted Karanka, A/Regional Project Manager	(867) 874-7002
Mackenzie Valley Land and Water Board	(867) 669-0506
Department of Fisheries and Oceans	
Pete Cott, Area Habitat Biologist	(867) 669-4912
Environment Canada, Environmental Protection Division	
Stephen Harbjcht	(867) 669-4700
Department of Indian and Northern Affairs	
David Jessiman	(867)669-2660

Appendix II
Consultation Report

Correspondence A:
The following letter was sent to the following contacts which were provided by Mackenzie Valley Land and Water Board

Steven Ellis, Lutselk'e Dene First Nation, (Fax) 370-3010	Phone 370-3051
Yellowknife Metis National Local #66, (Fax) 873-4097	
Rae-Edzo Metis National Local #64, (Fax) 371-3119	
Rae Edzo First Nation (Dogrib Rae Band), (Fax) 392-6150.	Phone: 392-6581
Yellowknifes Dene First Nation (Ndilo), (Fax) 873-8545	Phone 669-9002
Yellowknifes Dene First Nation (Dettah), (Fax) 873-5969	Phone: 867/873-4307
Dene Nation, Chris Paci, (Fax) 867/920-2254	Phone: 867/873-4081
North Slave Metis Alliance, Bob Turner (Fax) 669-7442	Phone: 867/873-9176
Dogrib Treaty 11, Jolene Huskey (Fax) 766-3441	Phone: 867/766-3391

North American General Resources Corporation

80-8190 King George Highway
Surrey, BC
V3W 5B7
Tel: 604-594-1047
Fax: 604-594-7004

December 31, 2002

Yellowknifes Dene First Nation (Dettah)
Fax: 867-873-5969

Dear Sirs;

RE: Exploration Program at Wool Bay, NWT

North American General Resources Corp. would like to conduct an exploration on its Wool Bay project 25 kilometres southeast of Yellowknife and is contacting your organization for access and to see if your organization has any concerns with the program.

The Company has an option on the WBL 1 mineral claim with Tag # F74601 which has a kimberlite-like geophysical signature. Three maps are attached for orientation. The Company would like to conduct a small winter diamond drilling program on the claim to determine its merits. The program would involve 2-3 angled NQ diamond drill holes each approximately 150 metres deep on the edge of or proximal to an island 200 metres off the shore of Great Slave Lake at Wool Bay. The timing of the program would be late February or March 2003. The program would be supported from Yellowknife with crews commuting daily by 4x4 pick-up truck from Yellowknife to the work area, so no camp is necessary. The ice road that is expected to be installed to Drybones Bay would provide access for crews and equipment. A small (<1 km) spur off of this road would be needed

to Wool Bay. Fuel will be transported daily in a tidy tank on the back of one pick-up truck. Garbage, core and drill cuttings will be removed at the end of the drill program. The diamond drill program is expected to be about 10 days. The winter program would be followed by summer surface prospecting, mapping and sampling.

I shall be contacting you by phone to ensure that you have received this letter which I will fax and send by mail. Should you have any concerns to this exploration program, please contact me at the numbers above. The Company shall be making a Land Use application through the Mackenzie Valley Land and Water Board shortly.

Yours Truly,

Paul S. Cowley, P.Geol.
Vice President- Exploration

Correspondence B:

North American General Resources Corporation

80-8190 King George Highway
Surrey, BC
V3W 5B7
Tel: 604-594-1047 Fax: 604-594-7004

March 18, 2003

Chief Richard Edjericon
Yellowknives Dene First Nation
Box 2514, Yellowknife, N.T.
X1A 2P8

Fax: (867) 873-5969

Dear Chief Edjericon:

RE: YDFN Community Consultation Meeting April 2, 2003 for Wool and Drybones Bays

Thank you for opening the invitation for North American General Resources Corporation to attend the consultation meeting set up by the YDFN Lands and Environment committee for April 2, 2003. As you are aware, we are seeking a Land Use Permit for a small scale exploration program in the Wool Bay area.

I will be pleased to attend the meeting. According to your letter a number of stakeholders should, if they attend, provide multiple view points for your assessment of the proposed exploration programs at Wool and Drybones Bay areas. Respectfully, I ask that I may be

able to have a few informal words early on in the meet to provide your membership and committee with our short straightforward plan.

Should there be any changes to the date and location or if a formal agenda become available could you please contact me at (604) 202-7009 or by fax at (604) 642-6577 as I will not be at our office numbers listed above over the next two weeks.

Yours truly,

Paul Cowley, P.Geol.
VP Exploration

Copy to: Mrs. Melody Mcleod, Chair and Stephen Mathyk, Regulatory Officer
Mackenie Valley Land and Water Board
Box 2130, 7th Floor – 4910 50th Avenue
Yellowknife, NT X1A 2P6
Fax: (867) 873-6610

Correspondence C:

The following letter was sent to the following contacts

Chief Richard Edjericon
Yellowknives Dene First Nation
Box 2514, Yellowknife, N.T.
X1A 2P8

Chief Darrell Beaulieu
Yellowknikes Dene First Nation
Ndilo, NT

Rachael Crapeau
Yellowknives Dene First Nation
Box 2514, Yellowknife, N.T.
X1A 2P8

Chief Archie Catholique
Lutselk'e Dene First Nation
Fax: (867) 370-3010

North American General Resources Corporation

80-8190 King George Highway
Surrey, BC
V3W 5B7
Tel: 604-594-1047 Fax: 604-594-7004

April 7, 2003

Chief Richard Edjericon
Yellowknives Dene First Nation
Box 2514, Yellowknife, N.T.
X1A 2P8

Fax: (867) 873-5969

Dear Chief Edjericon:

RE: YDFN Community Consultation Meeting April 2, 2003 for Wool Bay

I want to thank you for the invitation and the opportunity to meet with you and your community. I would have liked to have had more time to speak to you personally but the meeting was very full as it was.

The meeting was very well attended in respect of the importance of Wool Bay to the community. Many issues and views were presented and I'm not wishing to recap or summarize from my view point here. Only that it was a good exposure to critical issues for me and I hoped that material I presented on our proposed drill plan near Wool Bay was informative to you and your community. I do hope that we can progress with a good line of communication, all knowing the sensitivities and concerns raised in the meeting.

I shall wish to keep in touch with you. If you should have any questions my best contact numbers for any future quick response is at (604) 202-7009 or by fax at (604) 642-6577.

Yours truly,

Paul Cowley, P.Geol.
VP Exploration

Copy to: Mrs. Melody Mcleod, Chair and Stephen Mathyk, Regulatory Officer
Mackenie Valley Land and Water Board
Box 2130, 7th Floor – 4910 50th Avenue
Yellowknife, NT X1A 2P6
Fax:(867)873-6610

Appendix III

Resume of Independent Reviewer

SENIOR ENVIRONMENTAL CONSULTANT

R.A.W. (Rick) Hoos, M.Sc., R.P.Bio.

EBA Engineering Consultants Ltd.

Mr. Hoos, Senior Environmental Consultant, has more than 30 years professional environmental, socioeconomic and major project management experience in the oil and gas, pipeline, and mining industries and with the Government of Canada. Mr. Hoos has managed and participated in multi-disciplinary teams working on numerous major projects, particularly in Northern and Western Canada, the United States, and Latin America.

During the 1980's, Mr. Hoos was fully involved with the management and implementation of comprehensive environmental, socioeconomic, regulatory and consultation programs for both onshore and offshore oil and gas exploration and development activities in the Mackenzie Delta/ Beaufort Sea region, year-round arctic shipping through the Northwest Passage and proposed oil and gas pipelines in the Mackenzie Valley and across the Yukon.

Over the past five years, Mr. Hoos has been involved with the design and implementation of broad-ranging environmental baseline studies in the Lac de Gras and Coronation Gulf regions, and environmental scoping studies for the proposed Inuvik to Tuktoyaktuk Road and the Norman Wells Oilfield. Most recently, he directed the completion of the Environmental Assessment Report (EAR) for expansion of the Ekati Diamond Mine™ and the relicensing of the Lupin Winter Road. Through this continuous work in the North, he has developed and maintained excellent relationships with many key people, organizations and the evolving regulatory regimes in the Western Arctic, Alaska and Labrador.

Specific roles in which he has served his northern clients include:

- Provided environmental management and regulatory support services for the Ekati Diamond Mine™, Hope Bay Gold Project, Tibbitt to Contwoyto Winter Road, CanTung Mine and diamond exploration on Victoria Island in the Northwest Territories.
- Managed the production of the major regional Environmental Impact Statement for Beaufort Sea/Mackenzie Delta Oil and Gas Development (BEARP) on behalf of Dome, Esso, Gulf and their 42 industry partners.
- Managed all environmental, socioeconomic, regulatory and public issues associated with the future $4.5 billion Mackenzie Valley natural gas pipeline (Polar gas) on behalf of TransCanada PipeLines and Tenneco Gas.

Education:

M.Sc., Oceanography/Marine Biology

University of Victoria
B.Sc., Biology/Geography, University of Calgary

Summary of Experience:

30 years - of professional environmental, socioeconomic and major project management experience in the oil and gas, pipeline, and mining industries and the Government of Canada.

25 years - involved with the management and consultation programs for both onshore and offshore oil and gas exploration and development activities in the Mackenzie Delta and Beaufort Sea regions, Alaska and in connection with proposed Arctic pipelines.

Affiliations:

Adjunct Professor of Natural Resources Management, Simon Fraser University, 1984 - Present

Director, Canadian Environmental Industry Association, B.C. Chapter

Director, Canadian Council for Aboriginal Business, 1994 - Present

Member, Association of Professional Biologists of British Columbia

Years of Experience: 30

Last Updated: June 12, 2001