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GRANULAR RESOURCE POTENTIAL

Lower Mackenzie Valley

MARCH 1986

PREPARED FOR

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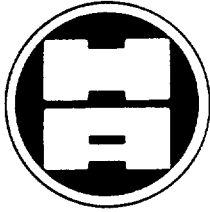
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**REPORT ON
EVALUATION OF GRANULAR RESOURCE POTENTIAL
LOWER MACKENZIE VALLEY**

**Prepared For
INDIAN AND NORTHERN AFFAIRS CANADA
Hull Quebec**

**Prepared By
HARDY ASSOCIATES (1978) LTD.
Calgary Alberta**

**CG10219
March 1986
5.203**



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Our Project No **CG10219**
Your Reference No

March 31, 1986

Indian & Northern Affairs Canada
Les Terrasses de la Chaudiere,
10, Wellington Street - 6th Floor
Hull, Quebec
K1A 0H4

Attention: Mr. R.J. Gowan, P. Geol.
Land Management Division

Dear Sir:

Re: Evaluation of Granular Resource Potential
Proposed Mackenzie Valley Pipeline Corridor

We are pleased to submit twenty (20) copies of our final report entitled "Evaluation of Granular Resource Potential, Lower Mackenzie Valley". This concludes the terms of our Contract No. OST85-00393.

In addition to the above copies, we are also including one mylar original of each of the four map sheets which are presented in Appendix "C" to our report.

We have very much appreciated the opportunity to undertake this study on your behalf, and we look forward to being of assistance in the future.

Yours truly,

HARDY ASSOCIATES (1978) LTD.

Per: *Brian E.W. Dowse*

Brian E.W. Dowse, M.Sc., P.Eng.
Geotechnical Manager,
Prairie Region

NM/gr

5/203
c.c. Lorraine Pederson
Supply and Services Canada



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Thanks are due to Mr. S. Murray of the Government of the Northwest Territories for providing information on projected granular material demands for various communities in the Mackenzie Valley. Also to Ms. E. Lavine of the Town of Inuvik and Messrs. P. Laroque and M. Amiss of Norman Wells for discussing aspects of borrow sources and requirements for these communities. Mr. D. Cook of the DPW in Edmonton, kindly made available a number of reports pertaining to the Mackenzie Highway studies.

Finally, thanks are also due to Mr. R. Gowan of INAC, who provided useful guidance and feedback during all phases of the study.



1.0 INTRODUCTION

Hardy Associates (1978) Ltd. was retained by Indian and Northern Affairs Canada (INAC) to undertake a review of borrow material studies completed in the vicinity of the proposed Lower Mackenzie Valley pipeline corridor, and to assess the granular resource potential of the area. Formal authorization to proceed with the study, as outlined in our proposal dated January 21, 1986, was received on February 17, 1986. Mr. R.J. Gowan, P. Geol. of INAC, was the Scientific Authority during this study, which was carried out under Contract No. OST85-00393.

1.1 TERMS OF REFERENCE

The overall objective of the study is to provide a summary of the granular resource potential of the Lower Mackenzie Valley, relative to projected future pipeline and community requirements for granular materials. It is intended that a detailed inventory of granular deposits will be compiled and maintained in a computer data file in order to more effectively manage these resources.

To this end, the detailed terms of reference for the study were established as follows:

- conduct a review of published and unpublished geological and geotechnical literature pertinent to the distribution of surficial materials along the proposed Mackenzie Valley pipeline route;



- identify and delineate, on the basis of the literature review, knowledge of the area and selective airphoto interpretation, all potential granular resource deposits along the pipeline route;
- subdivide the pipeline corridor into several proposed borrow management areas based on physiographic regions, the regional supply/demand situation, and/or likely pipeline construction spreads;
- prepare preliminary estimates of proven, probable, and prospective quantities of various granular material types in each of the proposed borrow management areas;
- assign a priority rating for additional field testing of each borrow source based on estimated quantity and quality, anticipated ease of access, and anticipated level of local demand;
- identify any known physical/environmental constraints that are encountered in delineating the source;
- identify the extent of additional exploration work required to prove up granular resource quantities and quality at selected high priority sites in each segment of the study area;
- summarize the results of the study by preparing a table, or series of tables, for each proposed borrow management area indicating all sources identified, location, access, landform and generic origin of deposit, environmental concern, quantity and quality of materials, additional



work required, priority rating for field testing, and an overall assessment of the prospect; and

- prepare a final report, including maps and tables, describing the results of the study. The report should include descriptions of:

- physiographic regions;
- surficial geology and geomorphology;
- granular material types;
- proposed borrow management areas;
- granular resource potential; and
- recommendations for future granular resource studies.

1.2 METHODOLOGY

The initial stages of the study involved an extensive review of existing published and unpublished information. A selected bibliography of the most important information sources is presented at the end of this report.

The locations of all potential granular deposits were then plotted on 1:250,000 scale map sheets which cover the whole study area. At the same time, all relevant geotechnical information on each deposit was compiled in tabular form. Individual deposits have been identified, investigated and described (in varying degrees of detail) by at least one and up to four or five previous studies.

Seven proposed borrow management areas were defined within the Lower Mackenzie Valley corridor. The areas were defined on the basis of physiography, location of existing communities and existing administrative boundaries. Natural physical



boundaries were utilized where appropriate (e.g. rivers, uplands and lowlands), however in some cases lines of latitude form the boundaries.

Utilizing the tabulated information on each granular deposit, an overall assessment (in terms of material quality and quantity) was determined. The more favourable deposits, i.e. those with fair to good quality material, were then further evaluated with respect to proven, probable and prospective quantities of reserves. The deposits with the highest quality materials were then further assessed to establish the amount of additional work required to fully evaluate the deposits and develop borrow pit management plans.

Finally this report, which presents the results of the study together with all contingent maps and tables, was prepared. All aspects of the study are described in more detail in the following sections.



2.0 STUDY AREA

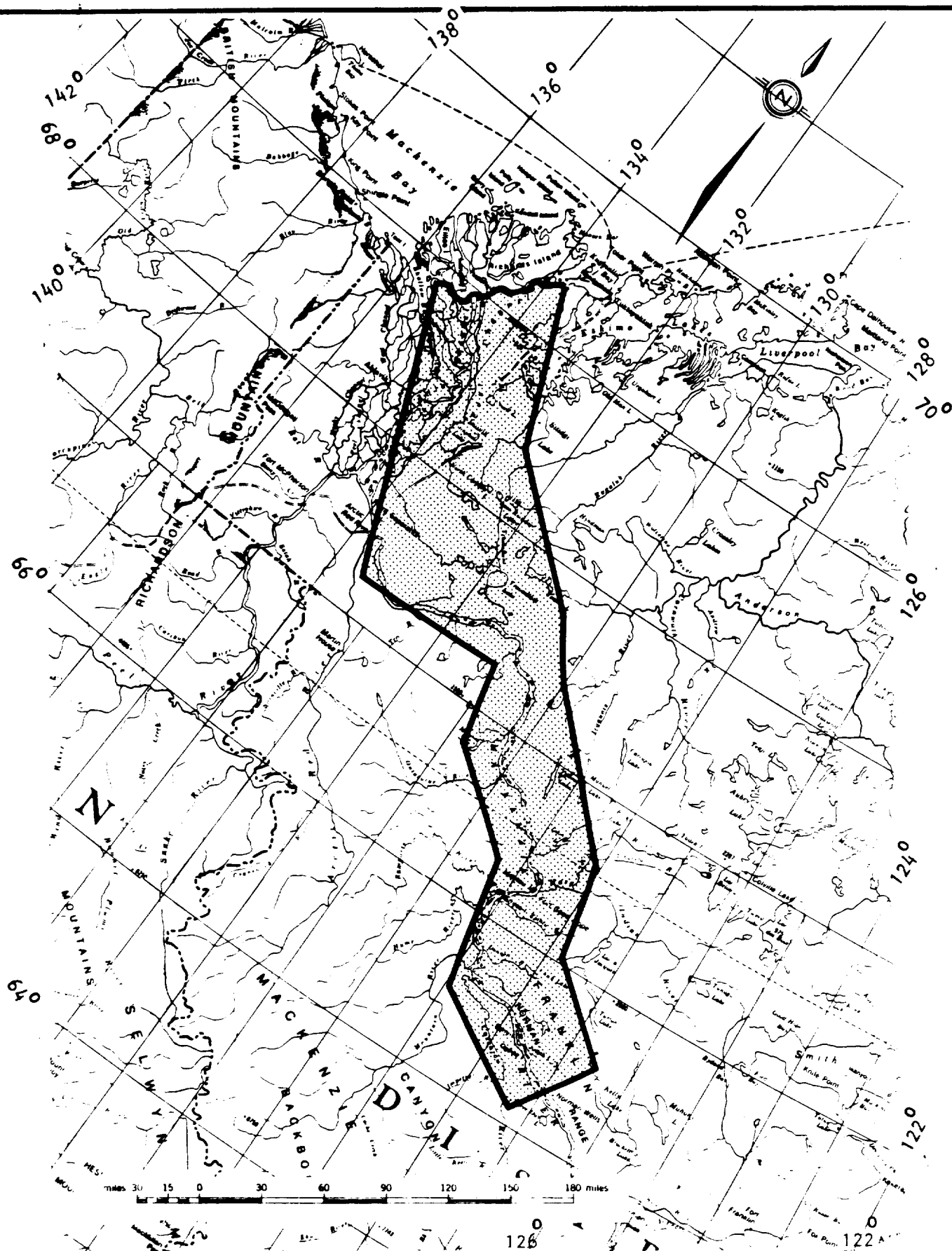
The study area is centred upon the Lower Mackenzie River Valley between Richards Island in the north and Norman Wells in the south. The northern boundary to the study area is taken as the East Channel of the Mackenzie River which separates Richards Island from the mainland. The boundaries of the study area are illustrated on Figure 1.

2.1 REGIONAL GEOLOGIC SETTING

The regional geologic setting of the study corridor is described below with respect to the physiographic regions intersected by the study area. Within each physiographic region the geomorphology and geologic conditions are considered to be relatively uniform; this influences the type and occurrence of surficial granular deposits. The physiographic regions intersected by the study area are shown on Figure 2, together with the proposed "Borrow Management Areas" (see Section 2.3). Reference to the 1:250,000 scale map sheets in Appendix "C" will aid in identifying specific geographic features which are discussed in the following sections.

2.1.1 Mackenzie Delta

The Mackenzie Delta is a physiographic subdivision of the Arctic Coastal Plain region. Within this subdivision the Caribou Hills (see Sheet C1, Appendix "C") form the major feature of positive relief.



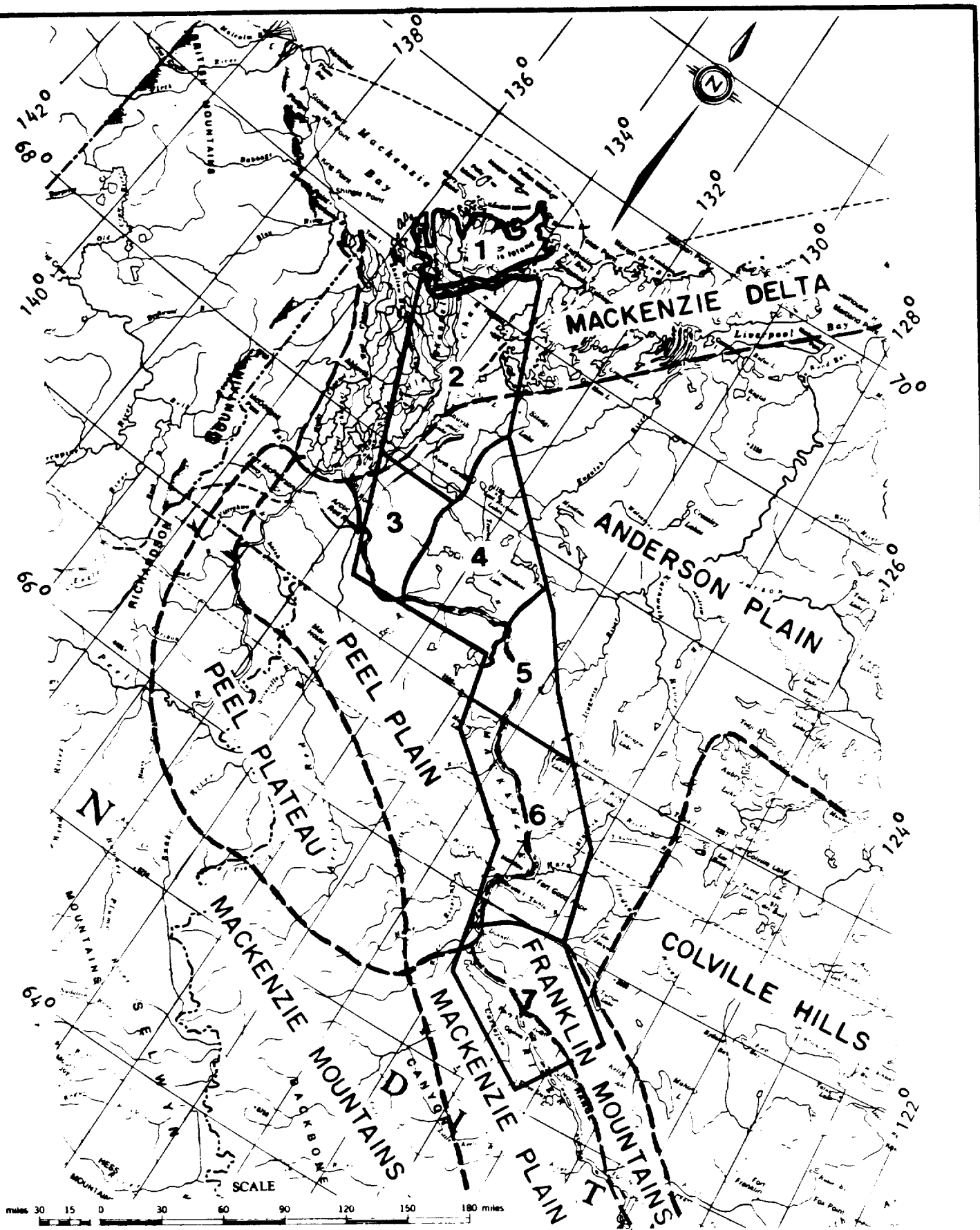
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STUDY AREA

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FIGURE 1

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BORROW MANAGEMENT AREAS & PHYSIOGRAPHIC REGIONS

CGIO219

FIGURE 2

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The Mackenzie Delta is a flat to hummocky deltaic plain comprising a large number of lakes and channels. It is composed of a mixture of unconsolidated Pleistocene and Recent deposits; the Recent deposits are predominant west of the East Channel, and vice versa. The Pleistocene deposits include morainal (till-like) materials, glaciofluvial sand and gravel (outwash and kames) and glaciolacustrine sediments, which overlie pre-glacial deltaic sands. The Recent deposits include fine-grained alluvial, organic, marine beach, and lacustrine sediments, however, some tributary channels contain coarse alluvial material (sand and gravel).

Bedrock is generally deeply buried beneath about 30 m to 150 m of pre-glacial, glacial and post-glacial deposits. However in the Caribou Hills area, bedrock rises to near surface elevations. Bedrock exposures in the northern Caribou Hills reveal poorly indurated Tertiary strata consisting of interbedded conglomerates, sandstones and mudstones. In the southern Caribou Hills there are Cretaceous shales, however, in the Campbell Lake Hills, south of Inuvik, erosion resistant Precambrian quartzites and argillites and Paleozoic carbonates are outcropping.

Surface drainage in the Mackenzie Delta area is often poorly developed, particularly on the areas with subdued topography. The Mackenzie River is the main drainage which comprises a maze of distributary channels in the Mackenzie Delta. The majority of discharge is through the larger channels and the East Channel separates Richards Island from the mainland. Flat topography is characterized by small beaded creeks which flow between the lakes; seepage often occurs along ice-wedge trenches which are characteristic of polygonal ground. On



gentle slopes drainage tends to occur as seepage along fen-filled valleys with no definite channel. Where definite channels exist the adjacent alluvial terraces often have standing water at the surface.

2.1.2 Anderson and Peel Plains

The Anderson Plain and the Peel Plain are both physiographic subdivisions of the Interior Plains region. The Anderson and Peel Plains occupy areas east and west of the Mackenzie River respectively, to as far south as the Franklin Mountains. The Mackenzie Valley "trench" separates these two physiographic subdivisions

Within the study area the Anderson Plain is predominantly an upland area (bedrock controlled) whereas the Peel Plain is lower lying except for an isolated upland area to the west of Little Chicago. The following description focuses on the Anderson Plain because the study area is mainly east of the Mackenzie River. However, the geological conditions in both the Anderson and Peel Plains are very similar.

Both "plains" are gently undulating to flat which reflects a variable thickness of glacial deposits overlying bedrock, and the topography is generally greater than 300 m above sea level (a.s.l.), particularly east of the Mackenzie River.

Along the west and northwest edge of the Anderson Plain, adjacent to the Mackenzie River, is the Sitidgi Lake/Campbell Lake lowland. This lowland area reflects the presence of a broad pre-glacial valley feature which is incised into bedrock. Surficial deposits in this area consist of



glaciolacustrine clays capped with organic deposits (peat). Along the southeast flank of the lowland (adjacent to the Anderson Plain upland) are drumlinized till deposits, fluted bedrock outcrops and some esker features which tend to parallel the drumlin/fluting lineation.

Further south, into the Rengleng River basin, the surficial materials comprise an extensive area of hummocky disintegration moraine with several glaciofluvial features (kames and eskers) and glaciolacustrine plains overlying the moraine locally. Recent accumulations of alluvial, lacustrine and organic materials occur in valleys and in level to depressional areas.

The upland areas centred upon Travaillant Lake, Tutsieta Lake and Yelte Lake, and the upland area west of the Mackenzie River at Little Chicago, display a variable thickness of glacial deposits overlying bedrock. The surficial deposits in these areas generally consist of hummocky ground moraine (till, 1.5-15 m thick) which is overlain by numerous glaciofluvial features such as kame complexes, eskers and outwash plains. The variable thickness of surficial material reflects a highly dissected bedrock surface, the thickest accumulations occur in broad incised valley features and bedrock depressions. Glaciolacustrine sediments are scattered throughout the valley features where they usually overlie till.

Numerous glaciofluvial features occur north of Travaillant Lake and along an irregular NW-SE trending glacial margin which extends from the Caribou Lakes area to southeast of Tutsieta Lake. In the northern part of this area kames and



kame fields tend to be more common, whereas further south esker ridges predominate. Outwash deposits (terraces and deltas) tend to occur in the form of valley trains which occupy the broad valley features. Relatively thick and extensive glaciofluvial terraces occur in the Thunder River system.

South of Yeltea Lake, the Peel and Anderson Plains are flatter and lower and contain fewer incised valleys. The area comprises a ground moraine (till) plain overlying bedrock, and upon which two major river systems (Loon River and Hare Indian River) have developed. Underlying the till in these major valleys are pre-glacial sands and gravels. Discontinuous glaciofluvial features (esker-kame complexes, outwash) and glaciolacustrine sediments overlie the till plain. A major esker-kame complex parallels the lower Hare Indian River, and thick glaciolacustrine deposits occur adjacent to the Mackenzie River south of Fort Good Hope. Wind has reworked some of the glaciolacustrine sediments to produce dunes in the Ramparts area.

The Mackenzie Valley trench, separating the Peel and Anderson Plains, contains a variety of glacial features and deposits, including drumlinized till plains, glaciolacustrine plains, glaciofluvial terraces, eskers and kame terraces. The Mackenzie River and tributaries have reworked some of these materials to produce various fluvial terraces and alluvial fans.

The bedrock formations beneath the Peel and Anderson Plains are generally relatively flat lying Cretaceous and Devonian sandstone, siltstone and shales which are frequently exposed



in the valley sides. The more competent sandstones tend to form cappings to the upland plateau areas either side of the Mackenzie River.

South of the Thunder River area the lithology includes Devonian limestones which together with resistant Cretaceous sandstones form bedrock ridges and some cliffs.

The shale bedrock is often unstable, (particularly if ice rich) as evidenced by flow slides near Little Chicago. Soliflucted weathered shale (silty) often forms a major component of colluvial materials along the bases of river valley escarpments.

Throughout the Anderson and Peel Plains a variety of Recent sediments have accumulated discontinuously over the glacial materials. These include recent alluvium in streams, lacustrine sediments in ponds and lakes, and organic deposits (peat-muskeg) in poorly drained level to depressional areas. Poor drainage and organic accumulations are characteristic of glaciated and permafrost terrains.

Surface drainage is moderately well to poorly developed on the Anderson and Peel Plains. The upland areas have moderately well developed drainage patterns, whereas the flatter, lowland areas are poorly drained. On both upland and lowland areas, poorly drained level to depressional areas have formed extensive organic terrains (fens, bogs, marshes).



2.1.3 Franklin Mountains

The Franklin Mountains are also a physiographic subdivision of the Interior Plains, and they occupy an area east of the Mackenzie River in the south part of the study area.

The Franklin Mountains are bedrock controlled, with topography rising to more than 500 m a.s.l. They comprise thrust and folded ridges of resistant, cliff-forming Devonian limestone and dolomite, with some shales and anhydrite, plus some Ordovician and Silurian carbonates.

A discontinuous, thin veneer of till and colluvium covers the bedrock, together with alluvial fans which occur where streams flow out of bedrock gorges. Talus slopes often occur at the base of cliffs, and some form rock glaciers where the ice content is high. In the less rugged areas the surficial deposits are moderately thick, and often overlain by thin organics. Level to depressional areas have thick organics (muskegs) with associated ponds and lakes in which Recent lacustrine sediments have accumulated.

The surface drainage pattern is well to poorly developed, depending upon topographic expression. Numerous lakes and ponds occur throughout the Franklin Mountains, in the poorer drained areas. Within the study area, the majority of streams flow westwards, draining into the Mackenzie River.

2.1.4 Mackenzie Plain

The Mackenzie Plain is another physiographic subdivision of the Interior Plains. In the study area the plain occupies an area on both sides of the Mackenzie River, west of the Franklin Mountains.



A variety of surficial deposits overlie bedrock beneath the Mackenzie Plain. The bedrock generally consists of soft sandstone and shale of Cretaceous and Devonian age. Local resistant Devonian carbonates form ridges and benches parallel to the Franklin Mountains.

The surficial deposits on the Mackenzie Plain comprise thin to thick ground moraine (till), glaciofluvial deposits, glaciolacustrine sediments and Recent alluvial, lacustrine, eolian and organic accumulations.

Beach ridges, associated with glaciolacustrine sediments occur at about elevation 150 m a.s.l. near Norman Wells. Glaciolacustrine sediments between 10-60 m thick occur between the beach ridges and the Mackenzie River. The glaciofluvial deposits (esker ridges, kame terraces) tend to occur upslope of the beach ridges and so directly overlie till; these landforms usually parallel the Mackenzie River.

The post-glacial activity of the Mackenzie River and its tributaries have reworked some of the glacial deposits into alluvial terraces. Wind has reworked some glaciolacustrine and glaciofluvial deposits into dunes.

Surface drainage on the flat-lying Mackenzie Plain is generally poorly developed with some major accumulations of thick organics (muskeg) and thermokarst ponds or lakes. The main streams and rivers have their headwaters in the adjacent mountains (Franklin and Mackenzie Mountains, see Figure 2) and discharge into the Mackenzie River from both east and west.



The Carcajou River, on the west side of the Mackenzie River, contains significant quantities of alluvial sand and gravel in terraces and within its present flood plain.

2.2 PERMAFROST CONDITIONS

The continuous permafrost zone extends northwards from a line which runs east-west at about the latitude of Little Chicago. In the continuous permafrost zone, frozen ground is ubiquitous, from near surface to several hundred metres depth. Taliks or unfrozen zones exist beneath most water bodies, and the active layer (seasonally thawed) varies in thickness from 0.3-3.0 m depending upon material type, drainage conditions, insulating cover, and solar aspect.

Excess ground ice occurs commonly and varies from ice crystals to massive tabular ice bodies. In the continuous permafrost zone, hummocky and rolling terrain is often due to the presence of massive ice in the cores of the hummocks. Massive ice bodies often occur at the contact between coarse granular material and finely textured deposits. Ice wedges occur in all types of material and ice lenses may be common in till and other finely textured deposits. The presence of massive ice is an important factor in planning the development and restoration of granular resource deposits.

Permafrost related processes impact significantly on the geomorphology via the dynamic processes of frost heaving, ice-wedge formation, pingo formation, solifluction and soil creep. Additional dynamic processes such as slumping and other modes of slope failure also serve to modify the landscape.



In the discontinuous permafrost zone, south of Little Chicago, the depth of permafrost is reduced, and this trend increases southwards. As the study area is within the northern reaches of the discontinuous permafrost zone, the extent of frozen ground is only marginally less than in the continuous zone. Locally unfrozen areas may be associated with old burns, high and well drained features, water bodies and springs. Ground ice is common in finely texture deposits such as till and glaciolacustrine sediments, especially if they are insulated by overlying organics and are poorly drained. The active layer varies similarly in depth from 0.3-4.5 m depending upon the same factors indicated above.

In the discontinuous zone, thermal degradation can cause thawing of massive ice leading to the formation of ponds and small lakes. These are characteristics of thermokarst terrain and serve to indicate how sensitive ice-rich soils can be to thermal degradation once disturbed.

2.3 PROPOSED BORROW MANAGEMENT AREAS

A total of six Borrow Management Areas are proposed for the study area and are illustrated in Figure 2. Richards Island, which is outside the study area, has been considered as a separate management area; thus seven management areas are defined between the Beaufort Sea and Norman Wells. The management areas are defined as follows:



MANAGEMENT AREA	DESCRIPTION
1	Richards Island (outside the scope of this study) is within the Mackenzie Delta physiographic subdivision. The boundary with Area 2 follows the Mackenzie Rivers' East Channel and Reindeer Channel.
2	Centred upon Noel Lake, with Inuvik as the main community; this area includes parts of the Mackenzie Delta and Anderson Plain physiographic subdivisions. The boundary with Area 3 is approximately Latitude 67° 55' North, (just south of Caribou Lake). The boundary with Area 4 is a line from the southeast shores of Sitidgi Lake to the west shores of North Caribou Lake then around the east side of Caribou Lake; this line essentially separates the Travaillant Lake uplands from the Mackenzie Delta lowlands to the west.
3	The Rengleng River basin area with Arctic Red River as the main community on the western boundary to the study area. This area includes parts of the Anderson Plain and Peel Plain physiographic subdivisions. The boundary with Area 4 is a line from the east side of Caribou Lake via the west



**MANAGEMENT
AREA**

DESCRIPTION

shores of Sunny Lake, Odizen Lake, Wounded Bear Lake, south through Pointed Hill, across the Mackenzie River and into the Tree River Valley. This boundary also separates the Travaillant Lake uplands from the Rengleng River basin/Mackenzie Valley lowlands to the west.

- 4 The Travaillant Lake uplands area with no major Community. This area comprises parts of the Anderson Plain and Peel Plain physiographic subdivisions. The boundary with Area 5 follows the Thunder River valley part way upstream and then downstream into the headwaters of the Iroquois River system. At the Thunder River/Mackenzie River confluence the boundary crosses the Mackenzie River due south and continues south to follow an unnamed river valley, west of the Mackenzie River.
- 5 Centred upon Tutsieta Lake, near Little Chicago. This area also includes parts of the Anderson Plain and Peel Plain physiographic subdivisions. The boundary with Area 6 is Latitude 67° North which corresponds to an administrative boundary between Inuvik in the north and Norman Wells in the south.



**MANAGEMENT
AREA**

DESCRIPTION

- 6 The Teida River, Loon River and Hare Indian River systems with Fort Good Hope as the main community. The area comprises parts of the Anderson Plain and Peel Plain physiographic subdivisions. The boundary with Area 7 is taken as the physiographic boundary between the Anderson Plain and the Franklin Mountains.
- 7 The Franklin Mountains/Mackenzie Plain region with Norman Wells as the main community at the south boundary to the management area. This area includes parts of the Franklin Mountains, Peel Plain and Mackenzie Plain physiographic subdivisions.



3.0 DATA EVALUATION AND PRESENTATION

3.1 SOURCE INFORMATION

Geological and geotechnical data was compiled from previous granular borrow studies in the Lower Mackenzie Valley. The sources of information included: Granular Material Inventories for DIAND, pipeline route investigations for industry, geotechnical investigations for the proposed Mackenzie Highway (Department of Public Works), and Geological Survey of Canada reports and maps. A complete list of reference material utilized in this study is presented in the bibliography at the end of this report.

The deposit outline and location of each potential borrow source is plotted on composite 1:250,000 scale map sheets. Where more than one study has been conducted on a particular deposit, the largest interpreted outline is plotted. A set of four overlapping map sheets (Sheets C1 to C4, in Appendix "C") have been utilized to illustrate the disposition of potential granular sources within the study corridor. The arrangement of these four maps with respect to the Lower Mackenzie Valley is shown on Figure 3. Match lines are used on Sheets C1 to C4 to facilitate the correct geographical orientation between adjacent maps. Proposed borrow management area boundaries are also shown, plus the recently established Inuvialuit Land Selections in the Mackenzie Delta area.



Each potential borrow source is identified with a number which defines the following:

- i) the borrow management area in which the source occurs
- ii) the source number (unique)
- iii) the class of material which occurs in the source (in parentheses).

This identification scheme is explained in the legend to the four map sheets.

The source numbers generally increase from north to south across the respective borrow management areas. Sources incorporated into the study following the initial numbering are numbered consecutively regardless of location. The material classification scheme used for this study is discussed in the next section.

3.2 SUMMARY TABLES

A total of six tables (B1 to B6) which summarize pertinent geological and geotechnical data for each potential borrow source, are presented in Appendix "B". The summary typically represents an integration of data from several information sources for most deposits, however some deposits only have one information source.

The following data and source parameters are presented on the tables.



3.2.1 Borrow Identification

- (i) Borrow Source Number: - a unique identification number similar to that discussed above which defines the borrow management area, and the source/deposit number; but omits the material classification.
- (ii) Cross Reference: - the borrow source or deposit number(s) previously defined for a particular deposit during other studies. The super-script number refers to the previous study report; a list of these reports is presented in Appendix "A".
- (iii) Location: - the geographic location of each deposit is defined with respect to Universal Transverse Mercator (UTM) zone and coordinates. For irregularly shaped deposits and groups of two or more deposits, the coordinates represent an estimated "centre-of-gravity" point.

3.2.2 Deposit Description

- (i) Material Type: - a description of the physical nature of the material available in the deposit, in accordance with the Unified Soil Classification system, and including the USC Group symbol where established. An explanation of this system is included in Appendix "A".
- (ii) Material Class: - an assessment of the material quality with respect to its suitability for use in construction. The classification used in this report is one which was developed by DIAND. A condensed version of the classification is included in the legend to the four 1:250,000 scale map sheets. The full classification is as follows:



Granular Material

Class 1 - Excellent quality material consisting of well graded, sands and gravels suitable for concrete aggregate, with a minimum of processing.

Class 2 - Good quality material generally consisting of well graded sands and gravels with varying quantities of silt. The occurrence of deleterious materials may negate its use as concrete aggregate. This material will provide good quality embankment fill; base and surface course aggregates; or possible production of concrete aggregates with extensive processing.

Class 3 - Fair quality material consisting generally of poorly graded, sands and gravels with or without substantial silt content. This material will provide fair quality general fill.

Class 4 - Poor quality material consisting generally of fine-grained, poorly graded silty sand with minor gravel. These deposits usually contain minimal quantities of sand and gravel, weak particles and deleterious materials. These materials are considered unsuitable for construction except as marginal general fill.

Class NG - Nongranular material, including both:

- a) Silt and clay material, which is generally unsuitable for construction purposes, and



b) Bedrock of fair to good quality; only available if blasted, quarried and processed. Potentially excellent sources of construction material.

(iii) Landform: - a comment on the origin of the geomorphic feature/terrain unit which constitutes the deposit, and within which geologic conditions are interpreted to be relatively uniform. This allows inferences to be made with respect to the disposition and quality of material in a deposit.

(iv) Ice Content: - an estimate of the likely ice content within the material based upon inference, and where available results of test pitting and drillholes. Data is presented in a semi-quantitative form indicating percentage of visible excess ground ice by volume, as follows:

None	=	0% visible excess ice or unfrozen
Low	=	less than 10% visible excess ice
Medium	=	10-30% visible excess ice
High	=	greater than 30% visible excess ice

(v) Surface Drainage: - a comment on the surface drainage characteristics of the deposit (landform) which is semi-quantitative as follows:

Good	=	Surface water drains quite rapidly by runoff and infiltration, soil generally unsaturated, watertable relatively depressed.
------	---	---

Fair	=	Surface water drains slowly, no standing water, soil partially saturated, watertable shallow.
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Poor = Surface water collects (standing water), soil saturated, perched watertable at surface, often associated with thick organic deposits.

3.2.3 Borrow Pit Development Information

- (i) Estimated Volume: - estimates of the useable granular material volumes available from the deposit, which are assessed and quantified on the basis of the following criteria.
 - a) Proven Resources: - granular material whose occurrence, distribution, thickness, and quality is supported by ground truth information such as geotechnical drilling, test pitting, and/or exposed stratigraphic sections. The volume is calculated assuming an average actual thickness of granular material sampled, extrapolated over an area of approximately 50 m radius around a drillhole/test pit. Adjustments are applied by assessing deposit homogeneity, ice content, drainage conditions and topography.
 - b) Probable Resources: - granular material whose existence and extent has been inferred on the basis of several different types of direct or indirect evidence including topography, landform characteristics, airphoto interpretation, extrapolation of stratigraphy, geophysical data and/or limited sampling. Additional investigation is required to determine a reliable estimate. The volume is estimated by projecting the known parameters (used to estimate proven resources) over the entire deposit, while adjustments are applied for drainage conditions and the erratic nature of some deposits.



- c) **Prospective Resources:** - granular material whose existence is merely speculated on the basis of limited indirect evidence such as airphoto interpretation, and/or general geological considerations. The volume is estimated for the maximum areal extent of the deposit, which is assessed from the physical features of the deposit and surrounding areas.

The volumes for some poor quality and non-granular sources have not been evaluated because they are unlikely to be considered for borrow. In addition volumes for most bedrock sources cannot be defined with any accuracy, as the potential volume is usually very large; hence bedrock volumes are usually assessed as "unlimited".

- (ii) **Estimated Recovery Depth:** - represents the likely maximum recoverable thickness of useable granular material, which is based upon test-pit and drillhole information (where available), or is otherwise inferred from an assessment of the deposits' physical features.
- (iii) **Overburden Thickness and Type:** - a comment on the proven and/or likely type and thickness of non-useable material overlying the granular deposit.
- (iv) **Access:** - a comment on the state of development of the deposit, together with information on modes of winter and summer access (where applicable) and the nature of surrounding terrain.



- (v) **Environmental Considerations:** - factual comments on particular aspects of environmental sensitivity which would have to be addressed if it was planned to develop the deposit
- (vi) **Data Quality/Reliability:** - a qualitative assessment of the amount of investigative effort which has been put into evaluating the deposit. This does not include a detailed evaluation of drilling/sampling methods, and depth of ground truthing. It is a measure of the level of confidence which can be placed in the summary data, the scheme is as follows:
- None = no groundtruth test-pitting or drilling information. The data is based solely on airphoto interpretation/terrain analysis.
- Poor = very few test pits and drillholes, and none to minimal laboratory testing (grain sizes)
- Fair = several to numerous test pits, drill holes, and numerous laboratory tests (grain sizes, moisture contents, petrographics)
- Good = numerous to many (tens) of test pits and drill holes, with a comprehensive laboratory testing program including moisture content, grain size, petrographics, organic content, abrasion and soundness tests etc.
- (vii) **Overall Assessment:** - this is a summary comment which is based essentially on the quality of available granular material with adjustments for ice content, surface drainage conditions and overburden. Little account is taken of accessibility or



environmental sensitivity as these are issues which will have to be addressed when development is planned, and once the locations of particular construction projects are known.

The rating applied to each deposit is a qualitative assessment of its suitability for development; the scheme used is as follows: unsuitable, favourable, good, excellent.

It is recognized that this scheme reflects (to some extent) the data quality/reliability and so is slightly biased towards those deposits which have been investigated in most detail.

3.2.4 Recommendations For Additional Work

The last section of the summary tables concerns recommendations for groundtruth drilling and sampling plus comprehensive laboratory testing, which are required to fully evaluate a particular deposit. Only those deposits which have an overall assessment of "good" or "excellent" have been further evaluated in this way. The amount of additional work recommended is considered to be sufficient to allow borrow pit development and restoration plans to be produced. Excluded from this evaluation are those deposits which fall within the Inuvialluit Land Selections in Borrow Management Area No. 2.

(i) Number of Boreholes:

This is estimated from a knowledge of the area of a deposit and the likely uniformity of the stratigraphy. Generally, a borehole grid spacing of 50-150m was applied. For particularly large deposits i.e. large areal extent, this has resulted in very large numbers of boreholes (thousands) to fully investigate and prove the whole deposit. It is



recognized that in reality investigations would zero in on small areas of the whole deposit and hence would require proportionately less exploration work. However, for the sake of consistency each good/excellent prospect has been treated as though the whole area is to be investigated.

In any investigation of granular deposits a certain number of test pits are desirable in conjunction with drilling. Test pits provide an opportunity to log exposed stratigraphic sections and obtain representative bulk samples for testing. Thus, a number of test pits should be substituted for drillholes wherever possible. In addition, detailed topographic surveying should be undertaken as part of the field program to obtain data necessary for volume calculations, and also to locate drillholes/test pits and aid in the preparation of stratigraphic sections.

(ii) Depth of Boreholes:

This is estimated from the likely maximum recoverable thickness of useable granular material, which is either based on drillhole/test pit data, or is inferred from geomorphic features. A depth range is given where actual groundtruth information indicates such a variation.

(iii) Laboratory Testing:

The scheme of laboratory tests recommended to classify and evaluate the material properties include the following: Moisture Content, Grain Size, Petrographic Analysis, Los Angeles Abrasion, Sulphate Soundness and Organic Impurities. This testing scheme is focused mainly on determining suitability for use as concrete aggregate. Should grain size



and petrographic analyses indicate the material to be unsuitable as concrete aggregate then the latter tests are unnecessary.

Determination of the moisture content is a relatively inexpensive standard test which is most useful in granular materials which contain significant proportions of sand and fines. It is appropriate in determining suitability for use as general fill, and also suitability for winter development of the source.

The grain size analysis provides the grading characteristics of the material (i.e. percentage of gravel, sand, silt & clay) which aids in classification for various uses eg. concrete aggregate, base coarse, general fill etc.

The petrographic analysis is a method for appraising the quality of granular material for use as concrete aggregate, and particularly to identify any components which may be deleterious to the concrete. It provides a method for comparing the quality of samples from the same or different sources.

The Sulphate Soundness and Los Angeles Abrasion tests are applied only to those samples which are evaluated as suitable for use in concrete aggregate. These two tests appraise the durability of coarse aggregate components to both physical abrasion and chemical attack; which simulate conditions which the aggregate is subject to in the manufacture of concrete.

Similarly, the Organic Impurity determination assesses the proportion of organic compounds in fine aggregates, as these compounds are deleterious to cement mortar and concrete.



The amount of testing recommended is calculated on the following basis:

- 2 Moisture Contents per 5 m of drilling/test pitting
- 3 Grain Sizes per 10 m of drilling/test pitting
- 1 Petrographic Analysis per 5 drillholes/test pits
- 1 L.A. Abrasion/Sulphate Soundness
and Organic Impurity per 10 drillholes/test pits (or a
minimum of one per site)

Numbers of particular laboratory tests are included on the tables in Appendix "B", where they are coded as follows:

- A) Moisture Contents
- B) Grain Sizes
- C) Petrographic Analyses
- D) L.A. Abrasion/Sulphate Soundness/Organic Impurities
(all three)

The laboratory testing programs indicated in the tables are presented as a guideline only, mainly for budgeting purposes. It is recognized that programs for site specific investigations may vary considerably from those in the tables, depending on the stratigraphic conditions encountered.

(iv) Priority:

A priority rating is assigned to each deposit. The rating reflects a qualitative assessment of the value of further exploration considering mainly the quality and quantity of available granular material, but also such factors as the local availability of good quality granular material, and proximity to community sites which may consider developing the deposits.



4.0 GRANULAR RESOURCE POTENTIAL

A detailed summary of significant granular deposit parameters is presented in Tables B1 to B6 in Appendix "B". The tables are organized by borrow management area, and the following discussion summarizes the granular resource potential of each management area. Borrow Management Area No. 1 (Richards Island) is outside the scope of this study.

4.1 BORROW MANAGEMENT AREA NO. 2

A total of 68 potential granular borrow sources have been identified in this area. Based upon the evaluation criteria discussed in Section 3.2 the overall assessment indicates that 2 deposits are Excellent prospects, 9 are Good prospects, 33 are Favourable prospects, and 23 are Unsuitable prospects.

The Inuvialluit Land Selections occupy part of this management area and any granular deposits within these land selections are controlled by the native peoples, and hence are of restricted availability. Preliminary estimates of the total available quantities of Class 1, 2 and 3 granular material in the management area, are presented in Table 1 (page 43). Calculated volumes are presented which both exclude and include those sources within the Inuvialluit Land Selections.

The eleven excellent and good prospects are distributed such that six of them occur inside, and five occur outside, the Inuvialluit Land Selections, respectively. Only those 5 which are outside the land selections area are considered for additional exploration work. The five deposits are source numbers 2.20, 2.28, 2.29, 2.30 and 2.45. Four of these (2.20,



2.28, 2.29 and 2.30) occur in the Wolverine Lakes/Parsons Lake area and the fifth (2.45) is immediately north of Noell Lake. They all contain Class 2 granular material, there is no Class 1 material identified outside the Inuvialuit Land Selections.

Each of these five deposits is of glaciofluvial origin, being either outwash plains, terraces or kames. The total available volume of Class 2 granular material contained in these five deposits is also presented in Table 1.

4.2 BORROW MANAGEMENT AREA NO. 3

A total of 23 potential granular borrow sources have been identified in Area 3. No Good or Excellent prospects for granular material have been identified; the granular deposits in this area are generally of poor quality. Nine of the deposits are Favourable prospects and the remaining 14 are Unsuitable prospects.

Class 3 material is the highest quality material which occurs in the area. It is located in five Favourable prospects and two Unsuitable prospects, which are either kames/eskers or alluvial features.

A preliminary estimate of the total available volumes of Class 3 material in Management Area No. 3 is included in Table 1.



4.3 BORROW MANAGEMENT AREA NO. 4

One hundred and twelve potential granular borrow sources have been identified in this area. The overall assessment of these sources indicates the following breakdown:

No	Excellent prospects
18	Good prospects
63	Favourable prospects
31	Unsuitable prospects

Preliminary estimates of the total available quantities of Class 1, 2 and 3 granular materials in the management area, are presented in Table 1.

The 18 Good prospects occur scattered throughout the Management Area, however there is a concentration of these prospects to the west and northwest of Travaillant Lake. None of these deposits contain Class 1 granular material. The majority (15) contain Class 2 granular material, whereas the remainder (3) comprise Class 3 material. The associated landforms are all glaciofluvial features i.e. outwash plains, terraces, kames and eskers.

Each of these deposits rate as high priorities for further investigation and testing. The total available volumes of Class 2 and Class 3 granular materials contained in these 18 Good prospects are included in Table 1.



4.4 BORROW MANAGEMENT AREA NO. 5

A total of 47 potential granular borrow sources have been indentified in Area 5. The overall assessment of these sources indicates there are 11 Good prospects, 30 Favourable prospects and 6 Unsuitable prospects; there are no Excellent prospects.

A preliminary estimate of the total available volumes of Class 1, 2 and 3 granular materials in Management Area No. 5, is presented in Table 1.

The eleven Good prospects comprise Class 2 or Class 3 material which is associated with glaciofluvial features such as outwash plains, eskers, kames and terraces. These prospects are scattered fairly evenly throughout the area, but three of them are on the west side of the Mackenzie River.

These eleven deposits are of high priority with respect to further exploration and testing to fully evaluate their potential. The total available volumes of Class 2 and Class 3 granular material contained in these 11 Good prospects are also presented in Table 1.

4.5 BORROW MANAGEMENT AREA NO. 6

Ninety-two potential granular borrow sources have been identified in this area. The overall assessment of these sources indicates that one is an Excellent prospect, 13 are Good prospects, 47 are Favourable prospects, and 31 are Unsuitable prospects.



An estimate of the total available volumes of Class 1, 2 and 3 granular materials contained in these borrow sources, is presented in Table 1.

The majority of the fourteen Excellent/Good prospects occur around and north of Fort Good Hope, in the central part of the Management Area. In the north part and south of Fort Good Hope, deposits of good quality granular material are scarce.

Class 2 granular material occurs in ten of the Excellent/Good prospects, the remaining three are Class 3 material. All are associated with glaciofluvial features (outwash plains, eskers, kames), except one which is an alluvial terrace. They are all considered to be of high priority for additional exploration work and testing. The total volumes of Class 2 and Class 3 granular materials contained in these 14 deposits is presented in Table 1.

4.6 BORROW MANAGEMENT AREA NO. 7

A total of 52 potential borrow sources have been identified in this area. An overall assessment of these sources indicates that 4 are Good prospects, 26 are Favourable prospects and 23 are Unsuitable prospects, there are no Excellent prospects identified.

A preliminary estimate of the total available quantities of Class 1, 2 and 3 granular materials in Borrow Management Area No. 7 is presented in Table 1.

There is a lack of good quality granular material in Management Area No. 7. The four Good prospects all occur in



the southern part of the area; three comprise Class 2 granular material (associated with glaciofluvial delta deposits) and the fourth is Class 3 granular material associated with a kame-esker complex. The four Good prospects rate as high priorities for additional investigation and testing. The total volumes of Class 2 and Class 3 materials contained in these Good prospects are included in Table 1.

4.7 COMMUNITY AND OTHER REQUIREMENTS

Enquiries were made of the Government of the Northwest Territories in Yellowknife, plus the towns of Inuvik and Norman Wells, to obtain information on projected demands for granular materials. The data obtained is presented in the following sections and in Tables 2 and 3 at the end of this section. Table 2 presents total granular material demands (where available) for the various communities, and Table 3 includes a break-down of the requirement for various material types (material classes) where these were available.

In addition to this data, the following information was also made available.

4.7.1 Inuvik

No information was available on projected granular material requirements for Inuvik, however three borrow sources are regularly utilized by the town of Inuvik. These are borrow sources 2.48, 2.50 and 2.52, and they supply the following materials:



Borrow Source	Material
2.48	Class 3 granular material; the pit is located within the townsite.
2.50	Crushed rock aggregate from a quarry operation exploiting interbedded shale and limestone bedrock, located at the Inuvik Airport.
2.52	Crushed rock aggregate from a quarry in limestone bedrock, located approximately 20km southeast of Inuvik.

In addition to the community requirements (unknown) for granular material, airport development work, which commenced in 1985 and will continue into 1989, requires 9,000 m³ of crushed gravel and 29,000 m³ of general fill.

4.7.2 Arctic Red River

Projected granular material requirements for Arctic Red River are presented on Tables 2 and 3.

Additional borrow sources for Arctic Red River are currently under investigation. In the past the community has used borrow sources 3.9 and 3.10, which provided crushed rock aggregate and Class 3 granular material, respectively. Both of these sources are located very close to the town site. In addition, borrow source 650 (Ripley Klohn Leonoff, 1973) provides Class 2 granular material from a deposit which is



located about 18 km west of Arctic Red River. This latter deposit is outside the study area and so is not included in this report.

Current borrow source studies in Arctic Red River are focusing on the possibility of establishing a new pit to supply general fill material. Borrow sources 3.11 and 3.12 are being considered for this purpose, both are located close to and east of the townsite.

In addition to the community requirements, airport development work which is planned for 1988/89 will require 11,000 m³ of crushed gravel and 350,000 m³ of sand fill.

4.7.3 Fort Good Hope

Projected granular material requirements for Fort Good Hope are presented on Tables 2 and 3.

Borrow Source 6.80 supplies Class 2 granular material to the community at present. However, an inventory of locally available granular material is scheduled for completion in 1986/87 to identify other sources.

During 1987/88 proposed airport development works anticipate a requirement for 14,300 m³ of crushed gravel, which will probably be obtained from borrow source 6.79.

4.7.4 Norman Wells

The community of Norman Wells anticipates a requirement for about 200,000 m³ of granular material (various classes) for



road construction and maintenance over the next few years. In addition, another 100,000 m³ will be required for planned airport development works during 1988/89; this volume includes 15,000 m³ of crushed gravel.

Beyond the community demands it is likely that a greater demand for construction material comes from the oilfield development activity in this area; however this was not established.

Four borrow sources are regularly used by the community, these are: 7.48 and NW1, NW4, NW14 (Pemcan Services "72"). The latter three sources are outside the study area and so are not included in this report. These four borrow sources supply the following materials:

Borrow Source	Material
7.48	Class 4 granular material (general fill); the pit is located on the west side of the Mackenzie River.
NW1	Class 3 to 4 granular material (general fill); the pit is located about 5km southeast of the town.
NW4	Crushed rock aggregate from a limestone quarry about 6km north-east of the town. Shale is also exploited west of the limestone quarry.
NW14	Class 3 granular material (general fill); the pit is located about 3km northeast of the town.



The four communities discussed above (Inuvik, Arctic Red River, Fort Good Hope and Norman Wells) each exploit between two and five local granular deposits or bedrock sources. The borrow sources are all located within 20 km of the town sites, with the majority being much closer than this. A review of probable available quantities of granular materials in these borrow sources indicates that they can satisfy the projected (known) community demands which are indicated above, but this review takes no account of what volumes have been used to date. Thus, it appears that there is no immediate requirement to locate new community borrow sources.

Inuvik and Arctic Red River both have a lack of local granular deposits (compared to Fort Good Hope and Norman Wells) to replace any worked-out borrow sources. Hence, these two communities should take priority for any future exploration work, as it becomes necessary.

4.7.5 Dempster Highway

The most northern segment of the Dempster Highway occurs in the study area between Arctic Red River and Inuvik. The maintenance of this highway requires a supply of pit run and crushed gravel, and generally every five years the road is re-surfaced. The actual volume requirements for materials were not obtained; however a typical amount of gravel required for surfacing the proposed Mackenzie Highway between Fort Good Hope and Inuvik was anticipated to be '3,400 tons per mile' (Techman Ltd. 1976), which is equivalent to about 3,000 m³ per kilometer. Maintenance requirements would presumably be somewhat less.



The Dempster Highway traverses parts of Borrow Management Areas 2 and 3 between Arctic Red River and Inuvik; approximately 55 km of highway occurs in both management areas. Assuming that $3,000 \text{ m}^3/\text{km}$ of gravel is required for surfacing and maintenance, then each management area must supply $165,000 \text{ m}^3$ of crushed gravel, every five years on average. Appropriate crushed gravel may be obtained by processing Class 1, 2 or 3 material. Management Area 2 contains a potential plentiful supply to meet this requirement. Management Area 3 likely contains a sufficient supply but there is no Class 2 material and not all Class 3 deposits will be suitable. Therefore Management Area 3 should be a high priority area for additional investigation work to secure a proven supply of material to meet the requirements for the Dempster Highway and the community of Arctic Red River.

4.7.6 Future Pipeline Requirements

There are no confirmed granular material requirements for future pipeline projects, however, some general indications are available from certain sources. In the recent Mackenzie Environmental Monitoring Program (1985) review of development scenarios for hydrocarbon development in the Lower MacKenzie Valley, estimates of gravel/fill requirements are given as $1,000$ to $3,000 \text{ m}^3/\text{km}$, including all facilities requirements. Polar Gas, in their application to the National Energy Board, have indicated an average requirement of $4,000 \text{ m}^3/\text{km}$, north of the Great Bear River. In contrast, Interprovincial Pipe Line (NW) Ltd., used an average of only about $450 \text{ m}^3/\text{km}$, for the Norman Wells pipeline, however, requirements for a similar small oil line north of Norman Wells could well be greater.



The granular material requirements for a future pipeline project between the Beaufort Sea and Norman Wells may be estimated for each Borrow Management Area. Two extremes of possible material requirements are $500 \text{ m}^3/\text{km}$ and $4,000 \text{ m}^3/\text{km}$, and using these upper and lower bound values the following volumes may be projected:

Management Area	Approximate Pipeline Length (km)	Total Granular Material Requirements, m^3	
		$500 \text{ m}^3/\text{km}$	$4,000 \text{ m}^3/\text{km}$
2	130	65,000	520,000
3	-	-	-
4	125	62,500	500,000
5	90	45,000	360,000
6	140	70,000	560,000
7	120	60,000	480,000

It is apparent that the estimated total available quantities of granular materials in the Borrow Management Areas can easily satisfy these pipeline requirements. However, until an actual pipeline corridor is chosen the availability of sufficient suitable material, close to the corridor, is unknown.

Clearly, the granular requirements will be dependent on the size and type of pipeline (oil or gas) and the design modes (buried or above grade). For the presently anticipated medium-sized oil pipeline followed by a large diameter gas



pipeline as one scenario, it is possible that the combined granular material requirement could be in the order of 3 to 4 million cubic meters in total, north of Norman Wells. The majority of this requirement would be for Class 2 and 3 material with only a very limited requirement for Class 1 material.

TABLE 1

SUMMARY OF GRANULAR MATERIAL VOLUMES, LOWER MACKENZIE VALLEY

ALL BORROW SOURCES					EXCELLENT/GOOD PROSPECTS		
BORROW MANAGEMENT	MATERIAL	ESTIMATED TOTAL VOLUME (m ³)			ESTIMATED TOTAL VOLUME (m ³)		
AREA	CLASS	PROVEN	PROBABLE	PROSPECTIVE	PROVEN	PROBABLE	PROSPECTIVE
2	1	1.4 x 10 ⁶	4 x 10 ⁶	12 x 10 ⁶	1 x 10 ⁶	3 x 10 ⁶	11 x 10 ⁶
	2	15.3 x 10 ⁶	59 x 10 ⁶	173 x 10 ⁶	7.4 x 10 ⁶	33 x 10 ⁶	112 x 10 ⁶
	3	33.5 x 10 ⁶	295 x 10 ⁶	1248 x 10 ⁶	15.2 x 10 ⁶	59 x 10 ⁶	172 x 10 ⁶
2*	1	--	--	--	--	--	--
	2	6.5 x 10 ⁶	26 x 10 ⁶	54 x 10 ⁶	6.5 x 10 ⁶	26 x 10 ⁶	54 x 10 ⁶
	3	10.2 x 10 ⁶	105 x 10 ⁶	531 x 10 ⁶	--	--	--
3	1	--	--	--	--	--	--
	2	--	--	--	--	--	--
	3	273,000	6.4 x 10 ⁶	7.7 x 10 ⁶	--	--	--
4	1	--	--	--	--	--	--
	2	5.5 x 10 ⁶	80 x 10 ⁶	175 x 10 ⁶	5.4 x 10 ⁶	80 x 10 ⁶	171 x 10 ⁶
	3	5.8 x 10 ⁶	145 x 10 ⁶	534 x 10 ⁶	420,000	23 x 10 ⁶	48 x 10 ⁶
5	1	--	--	--	--	--	--
	2	12.3 x 10 ⁶	98 x 10 ⁶	207 x 10 ⁶	12.3 x 10 ⁶	98 x 10 ⁶	207 x 10 ⁶
	3	3.7 x 10 ⁶	146 x 10 ⁶	390 x 10 ⁶	2.7 x 10 ⁶	27 x 10 ⁶	61 x 10 ⁶
6	1	--	--	--	--	--	--
	2	2.8 x 10 ⁶	17 x 10 ⁶	66 x 10 ⁶	2.8 x 10 ⁶	17 x 10 ⁶	66 x 10 ⁶
	3	3.5 x 10 ⁶	91 x 10 ⁶	418 x 10 ⁶	795,000	9 x 10 ⁶	21 x 10 ⁶
7	1	--	--	--	--	--	--
	2	4.6 x 10 ⁶	19 x 10 ⁶	34 x 10 ⁶	4.6 x 10 ⁶	19 x 10 ⁶	34 x 10 ⁶
	3	2.2 x 10 ⁶	30 x 10 ⁶	95 x 10 ⁶	50,000	350,000	700,000
Entire Study Area	1	1.4 x 10 ⁶	4 x 10 ⁶	12 x 10 ⁶	1 x 10 ⁶	3 x 10 ⁶	11 x 10 ⁶
	2	40.5 x 10 ⁶	273 x 10 ⁶	709 x 10 ⁶	32.5 x 10 ⁶	247 x 10 ⁶	590 x 10 ⁶
	3	48.9 x 10 ⁶	713 x 10 ⁶	2693 x 10 ⁶	19.2 x 10 ⁶	118 x 10 ⁶	303 x 10 ⁶
Entire* Study Area	1	--	--	--	--	--	--
	2	31.7 x 10 ⁶	240 x 10 ⁶	536 x 10 ⁶	31.6 x 10 ⁶	240 x 10 ⁶	532 x 10 ⁶
	3	25.7 x 10 ⁶	523 x 10 ⁶	1976 x 10 ⁶	4 x 10 ⁶	59 x 10 ⁶	131 x 10 ⁶

* Note: These volumes exclude those deposits within the Inuvialuit Land Sections.



TABLE 2

PROJECTED GRANULAR MATERIAL DEMAND*
LOWER MACKENZIE VALLEY COMMUNITIES

COMMUNITY	REQUIRED VOLUME (m ³)					Total
	1986	1987	1988	1989	1990	
Arctic Red River	4,500	22,900	5,450	16,850	----	49,700
Fort Good Hope	900	200	650	----	2,650	4,400

* Taken from Government of the Northwest Territories 5 Year Capital Plan.



TABLE 3
GRANULAR MATERIAL FORECAST
LOWER MACKENZIE VALLEY COMMUNITIES

MATERIAL TYPE	REQUIRED VOLUME (m ³)				
	1986	1987	1988	1989	1990
ARCTIC RED RIVER					
Embankment	3,450	15,150	2,250	11,800	----
Sub-base	350	800	1,400	----	----
Base	500	4,500	1,300	3,400	----
Surface Material	200	2,250	500	1,500	----
Concrete					
Aggregate	----	---	----	----	----
Riprap	----	200	----	----	----
Totals	4,500	22,900	5,450	16,850	5 Year Total 49,700 m ³
FORT GOOD HOPE					
Embankment	---	----	----	----	----
Sub-base	300	----	450	----	1,050
Base	600	200	200	----	800
Surface Material	---	---	---	----	800
Concrete	---	---	---	----	----
Aggregate	---	---	---	----	----
Riprap	---	---	---	----	----
Totals	900	200	650	----	5 Year Total 4,400 m ³



5.0

CONCLUSIONS AND RECOMMENDATIONS

This study has identified 292 potential granular sources in the Lower Mackenzie Valley (excluding Richards Island) and has provided a summary of all pertinent geological and geotechnical parameters for each source. An overall assessment of these sources has further identified 52 deposits which are excellent or good prospects by virtue of the quality of granular material which they contain (excluding those within the Inuvialluit Land Selections). These 52 deposits should be considered as high priorities for additional exploration work and testing to fully evaluate their potential as sources of excellent to fair quality (Class 1, 2 and 3) granular material.

The study has focused only on granular materials and bedrock sources have been classified as non-granular (NG)b. However, as some bedrock sources have the potential to provide granular material of excellent quality, a more detailed evaluation of bedrock in the study area is warranted. This is particularly true in areas where surficial granular materials are scarce.

Similarly, in areas with scarce, good quality granular material, such as Management Area No. 3 and south of Fort Good Hope, more attention should be placed on further evaluating the poorer quality deposits which would otherwise be discounted. Limited amounts of good quality material may occur locally in these deposits.

This is particularly true as far as Class 1 granular material is concerned, for there is none identified outside the Inuvialluit Land Selections (in Borrow Management Area No. 2).



It is quite likely that "pods" of Class 1 material may occur within deposits which are classified as Class 2 or 3. Also, some processing of Class 2 material may provide Class 1 aggregate which is suitable for use in concrete. The additional investigation work recommended in Tables B1 to B6 should aim to identify these possibilities.

In addition, good alternatives to granular material for use as general fill, are ice-poor glacial till (ground moraine deposits) and shale bedrock. Both of these alternatives have been used successfully by Public Works Canada on the Dempster Highway, and were planned for use along the proposed Mackenzie Highway.

The occurrence of massive ice bodies within granular deposits is of particular concern during borrow pit development. The massive ice represents waste material which must often be removed to access valuable granular material. Melt water from stockpiled ice must be controlled to prevent siltation of streams; and if left in situ care must be taken to prevent melting and degradation of pit slopes/faces. A more accurate delineation of massive ice is therefore desirable in the investigation stage, so that better planning can be undertaken. The use of geophysical techniques, such as resistivity surveying and ground radar, have been employed successfully in permafrost terrain for various purposes. It is suggested that geophysics could form a useful component to any subsequent field programs designed to evaluate granular deposits in the Lower Mackenzie Valley.

Comprehensive guidelines for the development of borrow sources exist in the publication "Environmental Guidelines Pits and



Quarries" which is published by INAC (1982). This booklet covers all aspects of planning, designing, operating and restoring borrow pits. Additional sections deal with the special problems of permafrost, and particular aspects of planning, designing and operating quarries.

The environmental impact of borrow source development has been addressed in a general way only in the tables which are included in Appendix "B". The comments included on the tables are taken from studies conducted up to 15 years ago, although they were briefly reviewed and updated to a limited extent during the course of this study. In the light of more recent data, increased environmental knowledge and modern philosophies concerning environmental protection; a comprehensive environmental study would now be appropriate to fully update and highlight those environmental parameters which will constrain borrow source development in the Lower Mackenzie Valley.

A relatively small proportion of the borrow sources have been developed, and are either abandoned or still being exploited. In order to maintain a relatively accurate inventory of remaining volumes, the amounts of granular materials extracted needs to be determined. Coupled with this aspect, a comprehensive review of community and industry preferences towards specific borrow sources and projected granular material requirements, could be undertaken.



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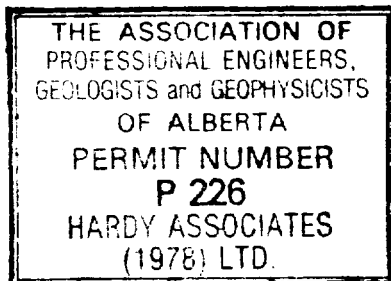
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- Community Study Area, Fort Good Hope, N.W.T.
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APPENDIX "A"
LIST OF CROSS REFERENCED REPORTS
AND EXPLANATION SHEETS



LIST OF CROSS REFERENCED REPORTS

Super-Script
Number

1. Pemcan Services "72". Stage I, Granular Materials Inventory.
 - Intercommunity Study Area, Norman Wells to Fort Good Hope, N.W.T.
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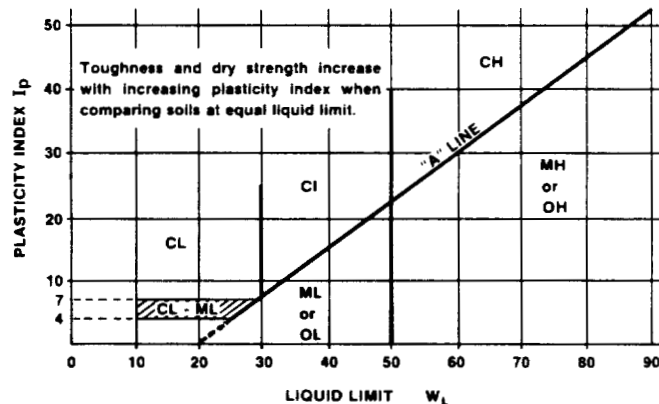
SOIL CLASSIFICATION SYSTEM (MODIFIED U.S.C.)

MAJOR DIVISION			GROUP SYMBOL	GRAPHIC SYMBOL	COLOR CODE	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA		
HIGHLY ORGANIC SOILS			PI		ORANGE	PEAT AND OTHER HIGHLY ORGANIC SOILS	STRONG COLOR OR ODOR, AND OFTEN FIBROUS TEXTURE		
COARSE-GRAINED SOILS (MORE THAN HALF BY WEIGHT LARGER THAN NO. 200 SIEVE SIZE)	GRAVELS MORE THAN HALF COARSE FRACTION LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS	GW		RED	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, < 5% FINES	$C_u = \frac{D_{60}}{D_{10}} > 4$ $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$		
			GP		RED	POORLY-GRADED GRAVELS, AND GRAVEL-SAND MIXTURES, < 5% FINES	NOT MEETING ALL ABOVE REQUIREMENTS		
		DIRTY GRAVELS	GM		YELLOW	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES > 12% FINES	ATTERBERG LIMITS BELOW "A" LINE OR $I_p < 4$		
			GC		YELLOW	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES > 12% FINES	ATTERBERG LIMITS ABOVE "A" LINE, $I_p > 7$		
	SANDS MORE THAN HALF COARSE FRACTION SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS	SW		RED	WELL-GRADED SANDS, GRAVELLY SANDS, < 5% FINES	$C_u = \frac{D_{60}}{D_{10}} > 6$ $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$		
			SP		RED	POORLY-GRADED SANDS, OR GRAVELLY SANDS, < 5% FINES	NOT MEETING ALL ABOVE REQUIREMENTS		
		DIRTY SANDS	SM		YELLOW	SILTY SANDS, SAND-SILT MIXTURES > 12% FINES	ATTERBERG LIMITS BELOW "A" LINE OR $I_p < 4$		
			SC		YELLOW	CLAYEY SANDS, SAND-CLAY MIXTURES > 12% FINES	ATTERBERG LIMITS ABOVE "A" LINE OR $I_p > 7$		
	FINE-GRAINED SOILS (MORE THAN HALF BY WEIGHT PASSES NO. 200 SIEVE SIZE)	SILTS BELOW "A" LINE ON PLASTICITY CHART; NEGLECTIBLE ORGANIC CONTENT		ML		GREEN	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY SANDS OF SLIGHT PLASTICITY	$W_L < 50$	SEE CHART BELOW
				MH		BLUE	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS	$W_L > 50$	
CLAYS ABOVE "A" LINE ON PLASTICITY CHART; NEGLECTIBLE ORGANIC CONTENT		CL		GREEN	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAYS, LEAN CLAYS	$W_L < 30$			
		CI		GREEN-BLUE	INORGANIC CLAYS OF MEDIUM PLASTICITY SILTY CLAYS	$W_L > 30, < 50$			
		CH		BLUE	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	$W_L > 50$			
ORGANIC SILTS & ORGANIC CLAYS BELOW "A" LINE ON PLASTICITY CHART		OL		GREEN	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	$W_L < 50$			
		OH		BLUE	ORGANIC CLAYS OF HIGH PLASTICITY	$W_L > 50$			

- All sieve sizes mentioned on this chart are U.S. Standard, ASTM E11.
- Boundary classifications possessing characteristics of two groups are given combined group symbols eg GW-GC is a well-graded gravel-sand mixture with clay binder between 5% and 12%.
- Soil fractions and limiting textural boundaries are in accordance with the Unified Soil Classification System, except that an inorganic clay of medium plasticity (CI) is recognized.
- The following adjectives may be employed to define percentage ranges by weight of minor components:

and	50 - 36%
some	35 - 21%
little	20 - 11%
trace	10 - 1%

PLASTICITY CHART



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APPENDIX "B"

TABLES B1 TO B6:

SUMMARY OF POTENTIAL BORROW SOURCE DATA

TABLE B1: BORROW MANAGEMENT AREA No.2 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORROWHOLES	DEPTH OF BORROWHOLES (M)	LABORATORY TESTING	PRIORITY
2.01	155 ²	ZONE 8 555,000E 7,681,000N	SAND-SOME GRAVEL, LITTLE SILT (SM-SP)	4	ALLUVIAL BENCHES	MEDIUM TO HIGH	FAIR	B) 750,000	0.9-1.5	0.3-0.6 PEAT/SILT	UNDEVELOPED REMOTE THERMOKARST TERRAIN	SILTATION OF ADJACENT STREAM	POOR	UNSUITABLE				LOW
2.02	214 ² BD2-16 ⁹	ZONE 8 542,100E 7,684,100N	SAND-FINE TRACE SILT (SP)	4	ALLUVIAL TERRACE	MEDIUM	GOOD	A) 50,000 B) 500,000 C) 6 X 10 ⁶	9	0-0.6 TOPSOIL/SILT	UNDEVELOPED BARGE-SUMMER TRUCK-WINTER ROAD	MAJOR WATERFOWL STAGING AREA SILTATION INTO RIVER	POOR	UNSUITABLE				LOW
2.03	215 ²	ZONE 8 532,500E 7,681,500N	SAND & GRAVEL TRACE SILT (SM)	3	DELTA REMNANT	LOW TO MEDIUM	GOOD	A) 5,000 B) 25,000 C) 35,000	1.5	0.3-1.8 TOPSOIL & SILT	UNDEVELOPED BARGE-SUMMER TRUCK-WINTER ROAD	MAJOR WATERFOWL STAGING AREA, SILTATION OF RIVER	POOR	UNSUITABLE				LOW
2.04	304 ²	ZONE 8 573,000E 7,671,500N	GRAVEL & SAND (GM)	3	SMALL ESKERS	LOW	GOOD	A) 20,000 B) 45,000 C) 50,000	3.5	0-0.6 TOPSOIL/SILT	UNDEVELOPED WINTER ROAD	SUMMER RANGE OF REINDEER	POOR	FAVOURABLE				MEDIUM
2.05	305 ²	ZONE 8 569,000E 7,662,000N	SAND & GRAVEL TRACE SILT (SM-GM)	2	KAMES ON GLACIOFLUVIAL OUTWASH PLAIN	LOW TO HIGH	GOOD	A) 40,000 B) 225,000 C) 500,000	9	0-0.6	UNDEVELOPED WINTER SNOW ROAD	REINDEER FANNING GROUND	POOR TO FAIR	FAVOURABLE				MEDIUM
2.06	306 ² BD3-1 ⁹	ZONE 8 562,700E 7,661,500N	GRAVEL & SAND (GP)	2	KAMES ON GLACIOFLUVIAL OUTWASH PLAIN	LOW	GOOD	A) 50,000 B) 1X10 ⁶ C) 3X10 ⁶	2	0-1.2 PEAT/SILT	UNDEVELOPED WINTER SNOW ROAD THERMOKARST TERRAIN	REINDEER FANNING GROUNDS	POOR	GOOD	INSIDE INUVIALUIT LAND SELECTIONS			LOW
2.07	BD2-37 ⁹	ZONE 8 526,000E 7,664,000N	SAND	4	GLACIOFLUVIAL OUTWASH PLAIN		FAIR TO GOOD	C) 25 X 10 ⁶	30	0.6-3.3 TOPSOIL & SILT	UNDEVELOPED WINTER ROAD, FLAT THERMOKARST TERRAIN SUMMER-BARGE	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
2.08	303 ² LUCAS POINT ⁸ BD2-32 ⁹	ZONE 8 518,200 E 7,622,000N	SAND AND GRAVEL TRACE OF SILT (SM-GP)	3	GLACIOFLUVIAL TERRACES	LOW TO MEDIUM	GOOD	A) 4.5 X 10 ⁶ B) 7 X 10 ⁶ C) 10 X 10 ⁶	6	0.9-1.5 PEAT/ORG. SILT	UNDEVELOPED BARGE-SUMMER TRUCK-WINTER ROAD	MAJOR WATERFOWL STAGING AND BREEDING AREA SILTATION INTO RIVER	GOOD	GOOD	INSIDE INUVIALUIT LAND SELECTIONS			LOW
2.09	302 ² BD2-33 ⁹	ZONE 8 516,600E 7,657,700N	GRAVEL AND SAND SOME SILT (GM-GM)	1	GLACIOFLUVIAL TERRACE	LOW TO HIGH	GOOD	A) 400,000 B) 1 X 10 ⁶ C) 1 X 10 ⁶	3	0-0.15 PEAT AND SILT	UNDEVELOPED BARGE-SUMMER TRUCK-WINTER ROAD	IMPORTANT WATERFOWL STAGING AND BREEDING AREA	POOR	GOOD	INSIDE INUVIALUIT LAND SELECTIONS			LOW
2.10	301 ² BD2-35 ⁹	ZONE 8 519,800 E 7,652,200N	SAND AND GRAVEL LITTLE SILT (GM-GM)	3	GLACIOFLUVIAL TERRACE	LOW TO HIGH	GOOD	A) 500,000 B) 2.5 X 10 ⁶ C) 4 X 10 ⁶	3	0.3 - 1.2 PEAT/SILT	UNDEVELOPED BARGE-SUMMER TRUCK-WINTER ROAD	WITHIN THE MACKENZIE CRITICAL WILDLIFE REGION	POOR	FAVOURABLE				MEDIUM
2.11	300A ² BD2-36 ⁹	ZONE 8 536,800E 7,641,400N	SILT SOME GRAVEL TRACE SAND (ML)	NG	GLACIOFLUVIAL TERRACE	MEDIUM TO HIGH	GOOD			0.3 - 1.2 PEAT/SILT	UNDEVELOPED	MACKENZIE DELTA CRITICAL WILDLIFE REGION	POOR	UNSUITABLE				LOW
2.12	326 ² DEVILS LAKE ⁸ BD3-15 ⁹	ZONE 8 521,600E 7,632,000N	SAND AND GRAVEL TRACE SILT	2	FLUVIAL TERRACE/DELTA	LOW TO MEDIUM	FAIR	A) 6.5 X 10 ⁶ B) 17 X 10 ⁶ C) 30 X 10 ⁶	12	0.15-1.5 PEAT AND SILT	UNDEVELOPED BARGE-SUMMER TRUCK-WINTER ROAD	MACKENZIE DELTA CRITICAL WILDLIFE REGION	GOOD	EXCELLENT	INSIDE INUVIALUIT LAND SELECTIONS			LOW
2.13	1407 ³ BD3-16 ⁹	ZONE 8 522,900E 7,637,700N	GRAVEL AND SAND (GM-GM)	1	GLACIOFLUVIAL TERRACE/DELTA	LOW	GOOD	A) 1 X 10 ⁶ B) 3 X 10 ⁶ C) 11 X 10 ⁶	12	0.3-1.5 TOPSOIL/SILT	PARTIALLY DEVELOPED (INUVIK) BARGE-SUMMER TRUCK-WINTER RD.	MACKENZIE DELTA CRITICAL WILDLIFE AREA SILTATION OF RIVER	POOR	GOOD	INSIDE INUVIALUIT LAND SELECTIONS			LOW
2.14	324A ² BD3-21 ⁹	ZONE 8 525,500E 7,634,200N	GRAVEL AND SAND TRACE SILT (GM-GM)	2	FLUVIAL DELTA (TERTIARY)	LOW	GOOD	A) 180,000 B) 12 X 10 ⁶ C) 35 X 10 ⁶	15	0-1.5 PEAT/SILT	UNDEVELOPED BARGE-SUMMER TRUCK-WINTER ROAD	WITHIN CARIBOU HILLS RESERVE-INTERNATIONAL BIOLOGICAL PROGRAM CANNOT BE DEVELOPED	NONE	GOOD (SEE ENV.)	INSIDE INUVIALUIT LAND SELECTIONS			LOW
2.15	323A ² BD3-23 ⁹	ZONE 8 526,000E 7,631,200N	GRAVEL AND SAND TRACE SILT (GM-GM)	2	FLUVIAL DELTA (TERTIARY)	LOW	GOOD	A) 10,000 B) 1 X 10 ⁶ C) 45 X 10 ⁶	15	0-1.5 PEAT/SILT	UNDEVELOPED BARGE-SUMMER TRUCK-WINTER ROAD	WITHIN CARIBOU HILLS RESERVE-INTERNATIONAL BIOLOGICAL PROGRAM CANNOT BE DEVELOPED	POOR	GOOD (SEE ENV.)	INSIDE INUVIALUIT LAND SELECTIONS			LOW
2.16	322 ² BD3-22 ⁹	ZONE 8 529,500E 7,633,200N	SAND SOME GRAVEL SOME SILT (SM)	4	GLACIOFLUVIAL TERRACES	LOW TO HIGH	GOOD	A) 350,000 B) 2 X 10 ⁶ C) 7.5 X 10 ⁶	6	0-0.6 PEAT/SILT	UNDEVELOPED BARGE-SUMMER TRUCK-WINTER SNOW ROAD	NO MAJOR CONCERNS, SILTATION OF STREAMS AND LAKES	POOR	UNSUITABLE				LOW

TABLE B1: BORROW MANAGEMENT AREA No.2 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORROWHOLE	DEPTH OF BORROWHOLE (M)	LABORATORY TESTING	PRIORITY
2.17	317 ³ BD3-24 ⁹	ZONE 8 533,400E 7,631,800N	SAND AND GRAVEL TRACE SILT (SP)	3	KAMES WITH SECONDARY OUTWASH AREA	NONE TO LOW	GOOD	A) 450,000 B) 1.5 X 10 ⁶ C) 5 X 10 ⁶	3	0-1.65 PEAT/SILT	UNDEVELOPED WINTER SNOW ROAD, LEVEL THERMOKARST TERRAIN	NO MAJOR CONCERNS SILTATION OF STREAMS AND LAKES	POOR TO FAIR	FAVOURABLE				MEDIUM
2.18	316 ² BD3-25 ⁹	ZONE 8 535,600E 7,630,600N	SAND & GRAVEL TRACE SILT (SM-SM)	3	GLACIOFLUVIAL OUTWASH	NONE TO LOW	GOOD	A) 650,000 B) 3 X 10 ⁶ C) 10 X 10 ⁶	9	0-0.3 PEAT/SILT	PART DEVELOPED WINTER SNOW ROADS ONLY, FLAT THERMOKARST TERRAIN	NO MAJOR CONCERNS SILTATION INTO PETER LAKE	POOR TO FAIR	FAVOURABLE				MEDIUM
2.19	318 ² BD3-14 ⁹	ZONE 8 536,300 E 7,641,400N	SAND & GRAVEL TRACE SILT (SP-SM) GRAVEL & SAND (GM-GM)	3	GLACIOFLUVIAL OUTWASH AND REWORKED ALLUVIAL FAN	LOW TO HIGH	GOOD	A) 250,000 B) 2.5 X 10 ⁶ C) 5.5 X 10 ⁶	3	0-0.3 PEAT/SILT	UNDEVELOPED WINTER SNOW ROAD LEVEL THERMOKARST TERRAIN	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
2.20	319 ² 107B-B27 BD3-9 ⁹	ZONE 8 535,500E 7,646,700N	SAND & GRAVEL TRACE SILT (SP) GRAVEL & SAND (GM)	2	KAME FIELD	LOW	GOOD	A) 350,000 B) 4.5 X 10 ⁶ C) 10 X 10 ⁶	6	0-0.6 PEAT/SILT	UNDEVELOPED, REMOTE, WINTER SNOW ROAD	NO MAJOR CONCERNS SILTATION TO MOLVERINE LAKES	POOR TO FAIR	GOOD	145	6	A) 350 B) 260 C) 30 D) 15	HIGH
2.21	320 ² 107B-B17 BD3-8 ⁹	ZONE 8 533,800E 7,691,300N	SAND, SOME GRAVEL & SILT (SM-SP)	3	KAME FIELD	LOW TO HIGH	GOOD	A) 80,000 B) 400,000 C) 1.2 X 10 ⁶	3	0-1.5 PEAT/SILT	UNDEVELOPED WINTER SNOW ROAD	NO MAJOR CONCERNS SILTATION OF HOMES CREEK	POOR TO FAIR	FAVOURABLE				MEDIUM
2.22	321 ² BD3-7 ⁹	ZONE 8 542,300E 7,651,000N	SAND, SOME GRAVEL TRACE SILT (SP)	3	GLACIOFLUVIAL OUTWASH	LOW	GOOD	A) 200,000 B) 2 X 10 ⁶ C) 3.7 X 10 ⁶	6	0-0.6 PEAT/SILT	UNDEVELOPED BARGES-SUMMER TRUCK-WINTER ROAD	NO MAJOR CONCERNS SILTATION OF STREAMS AND LAKES	POOR	FAVOURABLE				MEDIUM
2.23	310A ³ BD3-4 ⁹	ZONE 8 547,000E 7,656,500N	SAND AND SILT TRACE GRAVEL (SP)	4	KAMES AND ESKIER COMPLEX	HIGH	GOOD	A) 55,000 B) 550,000 C) 5.5 X 10 ⁶	7.5	0.3-0.9 PEAT/SILT	UNDEVELOPED WINTER SNOW ROAD	NO MAJOR CONCERNS	POOR	UNSUITABLE				MEDIUM
2.24	BD3-6 ⁹	ZONE 8 549,000E 7,652,500N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSITS			A) 400,000 B) 4 X 10 ⁶ C) 12 X 10 ⁶			UNDEVELOPED WINTER ROAD FLAT THERMOKARST TERRAIN	SILTATION OF PARSONS LAKE	NONE	FAVOURABLE				LOW
2.25	308 ² BD3-3 ⁹	ZONE 8 560,000E 7,657,500N	SAND AND GRAVEL TRACE SILT (GM-GP) (SM-SP)	3	GLACIOFLUVIAL TERRACES AND KAMES	LOW TO MEDIUM	GOOD	A) 5,000 B) 300,000 C) 1.5 X 10 ⁶	7	0-0.6 PEAT/SILT	UNDEVELOPED, WINTER SNOW ROAD, FLAT THERMOKARST TERRAIN	REINDEER FARMING GROUND MARGINAL TO CRITICAL WILDLIFE HABITAT	POOR	FAVOURABLE				MEDIUM
2.26	307 ² BD3-2 ⁹	ZONE 8 560,000E 7,656,500N	GRAVEL & SAND TRACE SILT (GM-GM)	3	KAMES ON GLACIOFLUVIAL OUTWASH PLAIN	LOW TO HIGH	GOOD	A) 30,000 B) 300,000 C) 650,000	4	0-1.2 PEAT/SILT	UNDEVELOPED WINTER SNOW ROAD, FLAT THERMOKARST TERRAIN	REINDEER FARMING GROUNDS	POOR	GOOD	INSIDE INUVIALUIT LAND SELECTIONS			LOW
2.27	BD3-10 ⁹	ZONE 8 562,500E 7,647,200N	GRAVEL & SAND	3	GLACIOFLUVIAL OUTWASH			A) 7.5 X 10 ⁶ B) 75 X 10 ⁶ C) 350 X 10 ⁶	15		UNDEVELOPED, TWO EXISTING WINTER ROADS	REINDEER FARMING GROUNDS SILTATION OF STREAMS AND LAKES	NONE	FAVOURABLE				MEDIUM
2.28	309 ² 107B-B37 PARSONS LK11 BD3-5 ⁹	ZONE 8 559,900E 7,653,000N	GRAVEL AND SAND TRACE SILT (GM, SM-SM)	2	KAME FIELD & GLACIOFLUVIAL OUTWASH PLAIN	LOW	GOOD	A) 350,000 B) 1 X 10 ⁶ C) 4 X 10 ⁶	20	0-0.6 PEAT/SILT	PART DEVELOPED ADJACENT WINTER ROAD EXISTS	REINDEER FARMING GROUNDS, SILTATION OF PARSONS LAKE	GOOD	GOOD	70	10-20	A) 425 B) 300 C) 15 D) 10	HIGH
2.29	315 ² 107B-B47 BD3-13 ⁹	ZONE 8 544,600E 7,642,200N	SAND & GRAVEL TRACE SILT (SM-GM)	2	GLACIOFLUVIAL OUTWASH (DISSECTED)	LOW	GOOD	A) 3 X 10 ⁶ B) 10 X 10 ⁶ C) 10 X 10 ⁶	9	0-0.45 PEAT/SILT	UNDEVELOPED, WINTER ROAD.	NO MAJOR CONCERNS SILTATION OF STREAMS	POOR TO FAIR	GOOD	150	9	A) 550 B) 400 C) 30 D) 15	HIGH
2.30	312 ² PARSONS LAKEL BD3-11 ⁹	ZONE 8 560,000E 7,693,000N	GRAVEL AND SAND TRACE SILT (GM, SP-SM)	2	FLUVIAL/ GLACIOFLUVIAL TERRACES	LOW	GOOD	A) 4X10 ⁶ B) 4.5X10 ⁶ C) 10X10 ⁶	6	0-1.2 PEAT/SILT	UNDEVELOPED SUMMER-BARGE WINTER ROAD, FLAT THERMOKARST TERRAIN	REINDEER FARMING GROUNDS, SILTATION OF STREAMS AND LAKES	GOOD	EXCELLENT	10-15 TEST PITS	3	A) 25 B) 15 C) 3 D) 1	HIGH
2.31	311 ² BD3-12 ⁹	ZONE 8 569,200E 7,642,600N	SAND, TRACE SILT AND GRAVEL (SP)	4	SAND BAR/ BEACH RIDGE	NONE TO LOW	GOOD	A) 250,000 B) 400,000 C) 9 X 10 ⁶	11	NONE	UNDEVELOPED WINTER SNOW/ICE ROAD SUMMER BARGES	REINDEER FARMING GROUNDS SILTATION OF ESKIMO LAKE	POOR	UNSUITABLE				LOW
2.32	313 ² BD3-18 ⁹	ZONE 8 562,700E 7,638,000N	SAND TRACE SILT (SP-SM)	4	GLACIOFLUVIAL OUTWASH ON COASTAL PLAIN	NONE TO LOW	GOOD	A) 7,500 B) 45,000 C) 5.5 X 10 ⁶	4.5	0.9 TOPSOIL SILT/CLAY	UNDEVELOPED SUMMER-BARGE WINTER ROAD, FLAT THERMOKARST TERRAIN	REINDEER FARMING GROUND, SILTATION OF STREAMS INTO LAKE	POOR	UNSUITABLE				LOW

TABLE B1: BORROW MANAGEMENT AREA No.2 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION						RECOMMENDATIONS FOR ADDITIONAL WORK				
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BOREHOLES	DEPTH OF BOREHOLES (M)	LABORATORY TESTING	PRIORITY
2.33	3272 BD3-199	ZONE 8 560,000E 7,635,000N	GRAVEL SOME SAND TRACE SILT (GM-GM)	3	GLACIOFLUVIAL COMPLEX	LOW TO HIGH	GOOD	A) 350,000 B) 7.5 X 10 ⁶ C) 15X10 ⁶	4.5	0.3-1.5 PEAT/SILT	UNDEVELOPED SUMMER-BARGE WINTER ROAD, FLAT THERMOKARST TERRAIN	REINDEER FARMING GROUND SILTATION INTO LAKE	POOR	FAVOURABLE				MEDIUM
2.34	BD3-209	ZONE 8 563,300E 7,634,400N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSIT			A) 1.5 X 10 ⁶ B) 15 X 10 ⁶ C) 55 X 10 ⁶	9		UNDEVELOPED DIFFICULT ACCESS WINTER SNOW ROAD SUMMER-BARGE	ENVIRONMENTALLY SENSITIVE REINDEER FARMING GROUNDS SILTATION OF ESKIMO LAKES	NONE	FAVOURABLE				MEDIUM
2.35	BD3-179	ZONE 8 568,000E 7,633,700N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSIT			A) 2.5 X 10 ⁶ B) 25 X 10 ⁶ C) 100 X 10 ⁶	9		UNDEVELOPED WINTER SNOW ROAD SUMMER-BARGE	REINDEER FARMING GROUNDS, SILTATION OF ESKIMO LAKES	NONE	FAVOURABLE				MEDIUM
2.36	BD3-279	ZONE 8 586,000E 7,631,000N	SAND & GRAVEL	3	GLACIOFLUVIAL PLAIN			A) 7.5 X 10 ⁶ B) 75 X 10 ⁶ C) 300 X 10 ⁶	9		UNDEVELOPED WINTER-SNOW/ICE ROADS, SUMMER BARGE	ENVIRONMENTALLY SENSITIVE REINDEER FARMING GROUNDS	NONE	FAVOURABLE				MEDIUM
2.37	BD3-269	ZONE 8 577,000E 7,631,000N	GRAVEL	3	GLACIOFLUVIAL DEPOSIT			A) 1 X 10 ⁶ B) 12.5 X 10 ⁶ C) 50 X 10 ⁶	9		UNDEVELOPED WINTER ROAD, FLAT, THERMOKARST TERRAIN	REINDEER FARMING GROUNDS	NONE	FAVOURABLE				MEDIUM
2.38	BD3-329	ZONE 8 576,000E 7,625,000N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSIT			A) 2.5 X 10 ⁶ B) 25 X 10 ⁶ C) 100 X 10 ⁶	9		UNDEVELOPED WINTER SNOW/ICE ROADS, SUMMER-BARGE	REINDEER FARMING GROUNDS SILTATION OF ESKIMO LAKES	NONE	GOOD	INSIDE INUVIALUIT LAND SELECTIONS			LOW
2.39	328A2 BD3-319	ZONE 8 571,700E 7,621,500N	SILT TRACE SAND & CLAY (ML)	NG	GLACIOFLUVIAL DEPOSIT	HIGH	FAIR			MOSS/SILT	UNDEVELOPED WINTER ROAD SUMMER-BARGE	REINDEER FARMING GROUNDS	POOR	UNSUITABLE				LOW
2.40	BD3-289	ZONE 8 570,000E 7,630,000N	SAND & GRAVEL	3	GLACIOFLUVIAL PLAIN			A) 1 X 10 ⁶ B) 10 X 10 ⁶ C) 40 X 10 ⁶	9		UNDEVELOPED WINTER ROAD - FLAT THERMOKARST TERRAIN SUMMER-BARGE	REINDEER FARMING GROUNDS, CRITICAL AREA.	NONE	FAVOURABLE				MEDIUM
2.41	3252 BD3-299	ZONE 8 563,000E 7,628,400N	GRAVEL & SAND TRACE SILT (GM)	3	GLACIOFLUVIAL TERRACE	LOW TO HIGH	GOOD TO FAIR	A) 600,000 B) 6X10 ⁶ C) 25X10 ⁶	6	0.3-1.35 PEAT/SILT	UNDEVELOPED WINTER RD, FLAT THERMOKARST TERRAIN SUMMER-BARGE	REINDEER FARMING GROUNDS, CRITICAL WILDLIFE AREA, SILTATION OF STREAMS & LAKE	POOR	FAVOURABLE				MEDIUM
2.42	3142 BD3-309	ZONE 8 544,600E 7,642,200N	SAND & GRAVEL (SM)	3	FLUVIAL TERRACES	LOW	GOOD	A) 30,000 B) 3X10 ⁶ C) 30X10 ⁶	9	0-0.45 PEAT/SILT	UNDEVELOPED TRUCK-WINTER RD, THERMOKARST TERR. SUMMER-BARGE	REINDEER FARMING GROUNDS SILTATION OF ADJACENT STREAM	POOR	FAVOURABLE				MEDIUM
2.43	107B-B67 107B-B87 BD3-339	ZONE 8 562,000E 7,610,500N	SAND & GRAVEL SOME SILT (GP-SM)	3 - 4	LACUSTRINE VENERED OUTWASH PLAIN	HIGH	FAIR TO GOOD	A) 1.8 X 10 ⁶ B) 18 X 10 ⁶ C) 180 X 10 ⁶	15	1.5-6.0 ICY CLAYS	UNDEVELOPED WINTER RD, FLAT THERMOKARST TERRAIN	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
2.44	107B-B77 BD3-539	ZONE 8 559,000E 7,600,500N	SAND-SILTY (SM)	3	GLACIOFLUVIAL OUTWASH	HIGH	FAIR	A) 25,000 B) 250,000 C) 1 X 10 ⁶	6	0.3-2.1 ICY PEAT SILT	UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
2.45	BD3-349	ZONE 8 557,000E 7,607,500N	SAND & GRAVEL	2	GLACIOFLUVIAL OUTWASH			A) 800,000 B) 8 X 10 ⁶ C) 25 X 10 ⁶	15		UNDEVELOPED WINTER ROAD FLAT THERMOKARST TERRAIN	SILTATION OF NOEL LAKE	NONE	GOOD	150	10-15	A) 750 B) 550 C) 30 D) 15	HIGH
2.46	10 & 1110	ZONE 8 554,500E 7,603,500N	SAND & GRAVEL SOME SILT/CLAY (GM, SM-SM)	3 - 4	SMALL KAMES OR CREVASSE FILLINGS	MEDIUM	GOOD	A) 10,000 B) 20,000 C) 25,000	1.0-3.5	0-2.1 PEAT/SILT CLAY	UNDEVELOPED ADJACENT TO EXISTING WINTER ROADS	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
2.47	1401A3 BD3-399	ZONE 8 552,500E 7,592,000N	SAND, SOME GRAVEL AND SILT (SM)	4	SMALL KAMES	HIGH	GOOD	A) 20,000 B) 250,000 C) 750,000	3.5	0.3-1.8 PEAT/SILT	UNDEVELOPED WINTER ROAD SUMMER BARGE	NO MAJOR CONCERNS	POOR TO FAIR	UNSUITABLE				LOW
2.48	14003 BD3-449	ZONE 8 554,000E 7,582,700N	SAND SOME GRAVEL & SILT (SM)	3	GLACIOFLUVIAL OUTWASH	LOW TO HIGH	GOOD TO FAIR	A) 20,000 B) 250,000 C) 850,000	3.5	0.3-0.9 PEAT/SILT	PARTIALLY DEVELOPED (INUVIK) ALL WEATHER ROAD	NO MAJOR CONCERNS	FAIR	FAVOURABLE				MEDIUM

TABLE B1: BORROW MANAGEMENT AREA No.2 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION					RECOMMENDATIONS FOR ADDITIONAL WORK					
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BOREHOLES	DEPTH OF BOREHOLES (M)	LABORATORY TESTING	PRIORITY
2.49	BD3-45 ⁹	ZONE 8 560,500E 7,579,300N	SHALE	NG	BEDROCK OUTCROP					3.3	DEVELOPED FOR MACKENZIE HIGHWAY GOOD ACCESS-FLAT THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
2.50	I402 ³ BD3-49 ⁹	ZONE 8 560,400E 7,577,300N	SHALE	NG	BEDROCK OUTCROP	NONE	GOOD	C) 4.5 X 10 ⁶ TO UNLIMITED	9 APPROX.	0-0.6 TOPSOIL SILT	DEVELOPED AND IN USE.	NO MAJOR CONCERNS	POOR TO FAIR	FAVOURABLE				MEDIUM
2.51	I404 ³ BD3-48 ⁹	ZONE 8 568,500E 7,576,200N	SANDSTONE	NG	BEDROCK OUTCROP	NONE	GOOD	C) 75,000 TO UNLIMITED	7.5 APPROX.	0-0.9 TOPSOIL SILT	DEVELOPED FOR DEMPSTER HIGHWAY	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
2.52	I403 ³ BD3-46 ⁹	ZONE 8 569,000E 7,578,100N	LIMESTONE	NG	BEDROCK OUTCROP	NONE	GOOD	C) 2 X 10 ⁶ TO UNLIMITED	13 APPROX.	0-0.9 TOPSOIL SILT	DEVELOPED FOR DEMPSTER HIGHWAY	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
2.53	I406 ³ BD3-43 ⁹	ZONE 8 573,000E 7,582,300N	GRAVEL & SAND TRACE SILT (GM-SM) (GM-SM)	3	ESKER RIDGE	LOW TO MEDIUM	GOOD	A) 4,500 B) 45,000 C) 250,000	4.5	0.3-0.6 TOPSOIL SILT	UNDEVELOPED WINTER ROAD FROM DEMPSTER HIGHWAY	NO MAJOR CONCERNS SILTATION OF STREAM	POOR	UNSUITABLE				LOW
2.54	BD3-38 ⁹	ZONE 8 590,000E 7,597,000N	SAND & GRAVEL	3	ESKER RIDGES			A) 10,000 B) 100,000 C) 750,000			UNDEVELOPED WINTER ROAD-FLAT THERMOKARST TERRAIN	ENVIRONMENTALLY SENSITIVE - REINDEER WINTER RANGE	NONE	FAVOURABLE				MEDIUM
2.55	452 ² 107B-B9 ⁷ BD3-40 ⁹	ZONE 8 593,600E 7,586,500N	SAND & GRAVEL (SM-SM, GM)	3	ESKER/KAME COMPLEX	LOW	GOOD	A) 200,000 B) 350,000 C) 4.5 X 10 ⁶	7.5	0.3-0.9 PEAT & SILT	UNDEVELOPED WINTER SNOW ROAD, FLAT THERMOKARST TERRAIN	REINDEER HERD WINTER RANGE	POOR	FAVOURABLE				MEDIUM
2.56	451 ² BD3-41 ⁹	ZONE 8 589,600E 7,582,500N	SAND LITTLE SILT (SM)	4	ESKERS	LOW TO MEDIUM	GOOD	A) 15,000 B) 30,000 C) 250,000	4.5	0.3-0.9 PEAT & SILT	UNDEVELOPED, WINTER ROAD FLAT THERMOKARST TERRAIN	REINDEER HERD WINTER RANGE	POOR	UNSUITABLE				LOW
2.57	450 ² 107B-B17 ⁷ BD3-42 ⁹	ZONE 8 586,500E 7,581,600N	SAND LITTLE GRAVEL & SILT (SM-SM)	3	ESKER RIDGES	MEDIUM	GOOD	A) 15,000 B) 150,000 C) 3.5X10 ⁶	9	0.3-0.9 PEAT AND SILT	UNDEVELOPED WINTER ROAD FLAT THERMOKARST TERRAIN	REINDEER HERD WINTER RANGE, CRITICAL WILDLIFE AREA.	POOR	UNSUITABLE				LOW
2.58	BD4-3 ⁹	ZONE 8 586,200E 7,577,000N	SAND & GRAVEL	3	ESKER RIDGES			A) 1,000 B) 5,000 C) 5,000	6		UNDEVELOPED, WINTER ROAD FLAT-GENTLY SLOPING THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
2.59	I405A ³ 107B-B10 ⁷ BD3-47 ⁹	ZONE 8 579,300E 7,578,200N	SAND & SILT (SM)	4	KAME TERRACES AND ESKERS	MEDIUM	GOOD	A) 2 X 10 ⁶ B) 7.5 X 10 ⁶ C) 15 X 10 ⁶	9	0.3-1.2 TOPSOIL, PEAT&SILT	UNDEVELOPED, WINTER ROAD FROM DEMPSTER HIGHWAY, OVER WET TERRAIN	NO MAJOR CONCERNS, SILTATION OF STREAMS	POOR TO FAIR	UNSUITABLE				LOW
2.60	BD3-54 ⁹	ZONE 8 573,500E 7,575,000N	SAND & GRAVEL	3	KAME TERRACE		GOOD	A) 5,000 B) 50,000 C) 250,000	6	0-0.3 TOPSOIL & SILT	UNDEVELOPED ADJACENT TO DEMPSTER HIGHWAY WINTER ROAD	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
2.61	BD3-50 ⁹	ZONE 8 572,500E 7,572,000N	SAND & GRAVEL SOME SILT	3	GLACIOFLUVIAL TERRACE			A) 250,000 B) 2.5 X 10 ⁶ C) 10 X 10 ⁶	9		UNDEVELOPED, CLOSE TO DEMPSTER HIGHWAY WINTER ROAD	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
2.62	453 ² BD3-51 ⁹	ZONE 8 570,600E 7,570,200N	SAND SOME GRAVEL (SM-SP)	3	SMALL KAMES	LOW	GOOD	A) 1,500 B) 15,000 C) 75,000	6	0.3-0.6 TOPSOIL SILT	FULLY DEVELOPED FOR DEMPSTER HIGHWAY SMALL QUANTITY REMAINING	MACKENZIE REINDEER GRAZING RESERVE, INTERNATIONAL BIOLOGICAL PROGRAM RESERVE	POOR	UNSUITABLE				LOW
2.63	454 ²	ZONE 8 552,000E 7,564,500N	SANDSTONE	NG	BEDROCK OUTCROP	NONE	GOOD	C) UNLIMITED	30 +	0-0.9 TOPSOIL	UNDEVELOPED WINTER SNOW ROAD SUMMER-BARGE	MACKENZIE REINDEER GRAZING RESERVE, PEREGRINE FALCON HABITAT	FAIR	FAVOURABLE				MEDIUM
2.64	1155 ⁴ BD4-6 ⁹	ZONE 8 586,900E 7,560,000N	SHALE & SILTSTONE	NG	BEDROCK OUTCROP	MEDIUM TO HIGH	FAIR			2.5 SILT, ICE RICH	UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	MODERATELY SENSITIVE, CARIBOU WINTER RANGE.	POOR	UNSUITABLE				LOW

TABLE B1: BORROW MANAGEMENT AREA No.2 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORHOLES	DEPTH OF BORHOLES (M)	LABORATORY TESTING	PRIORITY
2.65	458A ² BD4-B ⁹	ZONE 8 564,500E 7,558,000N	SILT & SAND (ML)	NG	ESKER	MEDIUM	GOOD	C) 450,000	1.5	0.3-0.9 TOPSOIL & SILT	UNDEVELOPED ADJACENT TO DEMPSTER HIGHWAY	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
2.66	BD4-10 ⁹	ZONE 8 566,000E 7,550,000N	GRAVEL & SILT	3	ALLUVIAL FLOOD PLAIN			A) 500,000 B) 5 X 10 ⁶ C) 20 X 10 ⁶	3		UNDEVELOPED WINTER ROAD-FLAT THERMOKARST TERRAIN	SILTATION OF ADJACENT RIVER	NONE	FAVOURABLE				MEDIUM
2.67	1156A ⁴ BD4-11 ⁹	ZONE 8 585,000E 7,554,000N	SILT & SAND LITTLE GRAVEL	NG	ESKER RIDGES	MEDIUM TO HIGH	GOOD				UNDEVELOPED, THERMOKARST TERRAIN	MODERATELY SENSITIVE WILDLIFE WINTER RANGES, SILTATION OF LAKES & STREAMS	POOR	UNSUITABLE				LOW
2.68	655A ²	ZONE 8 564,500E 7,540,000N	SILT SOME SAND LITTLE GRAVEL (ML)	NG	ESKER RIDGE OR KAME TERRACE	MEDIUM TO HIGH	GOOD			0.3-0.9 PEAT & SILT	UNDEVELOPED ADJACENT TO DEMPSTER HIGHWAY	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW

TABLE B2: BORROW MANAGEMENT AREA No.3 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORROWHOLES	DEPTH OF BORROWHOLES (M)	LABORATORY TESTING	PRIORITY
3.01	1117 ⁴	ZONE 8 573,000E 7,527,000N	SHALE	NG	BEDROCK OUTCROP		FAIR	C) UNLIMITED		1.5-3.0 SILT & CLAY	UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	NO MAJOR CONCERNS	FAIR	FAVOURABLE				MEDIUM
3.02	1118 ⁴	ZONE 8 583,500E 7,520,500N	SHALE	NG	BEDROCK OUTCROP		FAIR			6.0 SANDY CLAY	UNDEVELOPED THERMALLY SENSITIVE TERRAIN	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
3.03	1113A ⁴	ZONE 8 591,500E 7,509,000N	SHALE	NG	BEDROCK OUTCROP	HIGH				5.5 SILTY CLAY	UNDEVELOPED THERMALLY SENSITIVE TERRAIN	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
3.04	1114A ⁴	ZONE 8 582,500E 7,512,500N	SHALE AND SILTSTONE	NG	BEDROCK OUTCROP					6.0, SANDY CLAY	UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
3.05	1115 ⁴	ZONE 8 572,500E 7,513,500N	SAND & SANDSTONE	NG	BEDROCK OUTCROP	LOW	GOOD			1.8 CLAYEY SAND	UNDEVELOPED THERMALLY SENSITIVE TERRAIN	SILTATION OF TRIBUTARY TO RENGLENG RIVER	POOR	FAVOURABLE				MEDIUM
3.06	1116A ⁴	ZONE 8 562,500E 7,510,000N	GRAVELLY SAND (GM-SM)	3	ALLUVIAL TERRACE & SMALL ESKERS		GOOD	A) 15,000 B) 50,000 C) 75,000	2	0.15 PEAT	UNDEVELOPED	GRIZZLY BEAR HABITAT SILTATION OF STREAM	POOR	UNSUITABLE				LOW
3.07	1070 ⁴	ZONE 8 586,500E 7,495,000N	GRAVEL & SAND CLAYEY (SC)	4	ESKER		FAIR			0.15-0.45 CLAY & PEAT	UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
3.08	1069 ⁴ 6542	ZONE 8 571,000E 7,494,000N	SILT & SAND, SOME GRAVEL (GM)	4	GLACIOFLUVIAL OUTWASH PLAIN	HIGH	POOR TO GOOD	B) 1.5 X 10 ⁶	1.5-3	0.3-2.0 PEAT	UNDEVELOPED 16 KM EAST OF DEMPSTER HIGHWAY	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
3.09	AR607 ³	ZONE 8 552,250E 7,481,000N	SHALE SANDSTONE	NG	BEDROCK OUTCROP	LOW	FAIR	C) 150,000 TO UNLIMITED		0.3 TOPSOIL & PEAT	DEVELOPED EXISTING ROAD WINTER ACCESS ONLY	SILTATION OF ARCTIC RED RIVER	POOR	FAVOURABLE				MEDIUM
3.10	AR606 ³	ZONE 8 554,500E 7,481,250N	GRAVEL WITH SAND (GM-GM) AND SHALE	3	GRANULAR VENEER ON BEDROCK	LOW	GOOD	A) 10,000 B) 85,000 C) 85,000	1.5	0-0.6 TOPSOIL & SILT	DEVELOPED EXISTING ROAD ALL WEATHER ACCESS	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
3.11	AR605 ³	ZONE 8 556,000E 7,482,000N	SAND & SILT, SOME GRAVEL (SM)	4	ESKER	LOW TO HIGH	GOOD	B) 60,000	3	0.3-1.0 TOPSOIL & SILT	UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
3.12	AR609 ³	ZONE 8 556,000E 7,481,000N	SAND & GRAVEL (SM-SM)	3	KAME	LOW	GOOD	A) 8,000 B) 15,000 C) 50,000	4.5	0.15-0.3 SILT & TOPSOIL	UNDEVELOPED EXISTING ROAD WINTER ACCESS	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
3.13	AR604A ³	ZONE 8 554,250E 7,478,000N	SAND & SILT (SM)	4	LARGE KAMES SHORT ESKERS	MEDIUM TO HIGH	GOOD	B) 750,000	4	0.3-1.0 ORGANICS & TOPSOIL	UNDEVELOPED WINTER ROAD ONLY	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
3.14	AR-603A ³	ZONE 8 556,500E 7,476,000N	SAND WITH SILT (SM)	4	ESKER	LOW TO MEDIUM	GOOD	B) 400,000	1.5	0.3-1.2 TOPSOIL & SILT	UNDEVELOPED WINTER ROAD	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
3.15	AR-602 ³	ZONE 8 559,750E 7,478,500N	GRAVEL SOME SAND (GM-GM)	3	LARGE KAME	LOW TO HIGH	GOOD	A) 10,000 B) 100,000 C) 100,000	1.5	0-0.6 TOPSOIL & SILT	UNDEVELOPED WINTER ROAD	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
3.16	AR-601 ³	ZONE 8 564,500E 7,480,000N	GRAVEL & SAND (GM)	3	ESKER RIDGE	LOW TO MEDIUM	GOOD	A) 175,000 B) 1 X 10 ⁶ C) 2 X 10 ⁶	4.5-7.5	0.3-2.0 TOPSOIL & SILT	UNDEVELOPED SUMMER BARGE WINTER ROAD	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM

TABLE B2: BORROW MANAGEMENT AREA No.3 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION					DATA QUALITY		RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORROWHOLES	DEPTH OF BORROWHOLES (M)	LABORATORY TESTING	PRIORITY
3.17	AR-600 ³	ZONE 8 568,000E 7,483,500N	SAND & GRAVEL (SM-SM)	3	KAMES & ESKER	MEDIUM	GOOD	A) 5,000 B) 150,000 C) 400,000	1	0.1 PEAT & SILT	UNDEVELOPED WINTER ROAD	DISTURBANCE OF WILDLIFE HABITATS	POOR	UNSUITABLE				LOW
3.18	AR-608A ³	ZONE 8 571,000E 7,480,500N	SAND & SILT (SM)	4	KAMES	MEDIUM TO HIGH	GOOD	B) 15,000		0.3-1.0 TOPSOIL & SILT	UNDEVELOPED WINTER ROAD	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
3.19	1068A ⁴	ZONE 8 577,250E 7,483,000N	SILT	NG	LACUSTRINE DEPOSIT						UNDEVELOPED	SILTATION OF WHIRL LAKE	POOR	UNSUITABLE				LOW
3.20	D71A ⁴	ZONE 8 590,500E 7,486,000N	SILT	NG						0-0.15 MOSS	UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
3.21	1066A ⁴	ZONE 8 595,750E 7,482,500N	SILT	NG							UNDEVELOPED	SILTATION OF RABBIT HAY RIVER	POOR	UNSUITABLE				LOW
3.22	1065 ⁴	ZONE 8 598,500E 7,480,000N	SAND & GRAVEL	3	ESKER-KAME RIDGE	LOW	GOOD	A) 50,000 B) 5 X 10 ⁶ C) 5 X 10 ⁶	6	THIN	UNDEVELOPED THERMOKARST WINTER ROAD	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
3.23	1067A ⁴	ZONE 8 598,900E 7,476,500N	SILT	NG							UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW

TABLE B3: BORROW MANAGEMENT AREA No.4 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION								RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORROWHOLES	DEPTH OF BORROWHOLES (M)	LABORATORY TESTING	PRIORITY	
4.01	BD4-19 107B-816 ⁷	ZONE 8 598,500E 7,584,500N	GRAVEL	2	GLACIOFLUVIAL TERRACE			B) 2.5 X 10 ⁶ C) 7.5 X 10 ⁶	6		UNDEVELOPED WINTER ROAD THERMOKARST FEATURES	NO MAJOR CONCERNS	NONE	GOOD	130	6	A) 310 B) 235 C) 25 D) 13	HIGH	
4.02	BD4-19 107B-816 ⁷	ZONE 8 603,000E 7,582,000N	SAND AND GRAVEL	3	GLACIOFLUVIAL TERRACE AND PLAIN			B) 2.5 X 10 ⁶ C) 10 X 10 ⁶	6		UNDEVELOPED WINTER ROAD FLAT, THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM	
4.03	BD4-19 107B-816 ⁷	ZONE 8 600,000E 7,570,000N	GRAVEL, SILTY, SHALE FRAGMENTS	3	FLUVIAL TERRACE	MEDIUM TO HIGH	GOOD	A) 250,000 B) 2.5 X 10 ⁶ C) 10 X 10 ⁶	6	3.0	UNDEVELOPED MINOR RIVER CROSSING	ADJACENT MINOR RIVER, WILDLIFE HABITAT	NONE	FAVOURABLE				MEDIUM	
4.04	BD4-19 107B-816 ⁷	ZONE 8 595,500E 7,562,000N	SAND & GRAVEL CLAYEY (GC)	NG	EXTENSIVE KAME COMPLEX		POOR				UNDEVELOPED	HEADWATER AREA REINDEER GRAZING RESERVE, WINTER RANGE FOR CARIBOU	POOR	UNSUITABLE				LOW	
4.05	BD4-19 107B-816 ⁷	ZONE 8 600,000E 7,560,000N	GRAVEL	2	KAME		FAIR TO GOOD	A) 10,000 B) 400,000 C) 450,000	1.5	0.3-1.0	UNDEVELOPED WINTER ACCESS ONLY	NO MAJOR CONCERNS	POOR	GOOD	10	5	A) 20 B) 15 C) 2 D) 1	HIGH	
4.06	BD4-19 107B-816 ⁷	ZONE 8 600,000E 7,557,000N	SAND (GM) SILTY, SOME GRAVEL	3	KAME & KETTLE COMPLEX	LOW TO MEDIUM	POOR	A) 100,000 B) 2 X 10 ⁶ C) 2.5 X 10 ⁶	6	0-3.0 PEAT & SILT	UNDEVELOPED WINTER ROAD DIFFICULT ACCESS	SHORE OF LOST REINDEER LAKE, REINDEER GRAZING RESERVE, WINTER RANGE OF CARIBOU	FAIR	FAVOURABLE				MEDIUM	
4.07	BD4-19 107B-816 ⁷	ZONE 8 602,000E 7,554,600N	SAND & GRAVEL (GP-GM) TRACE TO SOME SILT	3	LARGE KAMES		FAIR	A) 150,000 B) 3 X 10 ⁶ C) 5 X 10 ⁶	7.5	3.3 PEAT & SILT	UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN (HILLY)	WEST SHORE OF LOST REINDEER LAKE REINDEER RESERVE, CARIBOU WINTER RANGE	POOR	FAVOURABLE				MEDIUM	
4.08	BD4-19 107B-816 ⁷	ZONE 8 587,200E 7,559,200N	SHALE	NG	BEDROCK OUTCROP		POOR			5.6 SILT & TILL	UNDEVELOPED THERMALLY SENSITIVE TERRAIN	HIGH SENSITIVITY THERMALLY SENSITIVE LAKE COMPLEX, CARIBOU WINTER RANGE	POOR	FAVOURABLE				MEDIUM	
4.09	BD4-19 107B-816 ⁷	ZONE 8 605,500E 7,550,000N	TILL	3	MORaine & KAME COMPLEX	MEDIUM	GOOD	A) 15,000 B) 1.0 X 10 ⁶ C) 25 X 10 ⁶	11	0-3.0 PEAT AND ORGANIC SILT	UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW	
4.10	BD4-16 ⁹ 1149A ⁴	ZONE 9 396,600E 7,553,600N	CLAY	NG			POOR				UNDEVELOPED	SILTATION OF ADJACENT LAKE	POOR	UNSUITABLE				LOW	
4.11	BD4-15 ⁹ 1150A ⁴	ZONE 9 394,000E 7,550,000N	SAND (SP-SM) TRACE GRAVEL TRACE SILT	4	ESKER-KAME COMPLEX		GOOD			0.15 MOSS	UNDEVELOPED DIFFICULT HILLY, THERMOKARST TERRAIN	WINTER RANGE OF BARREN-GROUND CARIBOU	POOR	UNSUITABLE				LOW	
4.12	BD4-18 ⁹ 1147 ⁴	ZONE 9 388,000E 7,547,000N	GRAVEL & SAND (GP-SM) SOME SILT	3	GLACIOFLUVIAL OUTWASH		GOOD	A) 2 X 10 ⁶ B) 10 X 10 ⁶ C) 25 X 10 ⁶	5	0.6, PEAT & SILT	UNDEVELOPED DIFFICULT ACCESS HILLY THERMALLY SENSITIVE TERRAIN	STRADDLES KUGALUK RIVER, FISH MIGRATION CARIBOU WINTER RANGE	POOR	FAVOURABLE				MEDIUM	
4.13	BD4-19 ⁹ 1148 ⁴	ZONE 9 400,000E 7,546,400N	GRAVEL & SAND (GP-GM) SILT, NUMEROUS COBBLES	3	GLACIOFLUVIAL OUTWASH REMNANTS		FAIR	A) 15,000 B) 1.5 X 10 ⁶ C) 6.5 X 10 ⁶	3	0.15 MOSS	UNDEVELOPED DIFFICULT ACCESS, HILLY THERMALLY SENSITIVE TERRAIN	WINTER RANGE OF BARREN-GROUND CARIBOU	POOR	FAVOURABLE				MEDIUM	
4.14	BD4-21 ⁹	ZONE 9 397,500E 7,542,000N	SAND AND GRAVEL	3	ESKER RIDGES			B) 20,000 C) 75,000			UNDEVELOPED WINTER ROAD FLAT TO ROLLING, THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM	
4.15	BD5-1 ⁹	ZONE 9 424,000E 7,542,500N	SAND AND GRAVEL	3	GLACIOFLUVIAL TERRACE			B) 5 X 10 ⁶ C) 40 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD FLAT, THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM	
4.16	BD5-2 ⁹	ZONE 9 435,000E 7,537,500N	GRAVEL	2	GRAVEL MOUNDS			UNKNOWN			UNDEVELOPED WINTER ROAD FLAT TO ROLLING THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM	
4.17	BD4-25 ⁹	ZONE 9 402,500E 7,537,000N	SAND & GRAVEL	3	GLACIOFLUVIAL TERRACE			B) 500,000 C) 2 X 10 ⁶	12		UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	SILTATION OF TRIBUTARY TO KUGALUK RIVER	NONE	FAVOURABLE				MEDIUM	

TABLE B3: BORROW MANAGEMENT AREA No.4 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION					RECOMMENDATIONS FOR ADDITIONAL WORK					
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BOREHOLES	DEPTH OF BOREHOLES (M)	LABORATORY TESTING	PRIORITY
4.18	BD4-24 ⁹	ZONE 9 391,000E 7,535,000N	SAND AND GRAVEL	3	GLACIOFLUVIAL TERRACES AND HUMMOCKY DEPOSITS			B) 7.5 X 10 ⁶ C) 30 X 10 ⁶	12		UNDEVELOPED WINTER ROAD FLAT THERMOKARST TERRAIN	SILTATION OF ADJACENT LAKES	NONE	FAVOURABLE				MEDIUM
4.19	BD4-23 ⁹	ZONE 9 385,200E 7,539,500N	GRAVEL, LITTLE SAND AND SILT	3	GLACIOFLUVIAL TERRACE			B) 400,000 C) 1.5 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD, FLAT THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
4.20	BD4-22 ⁹ 1138 ⁴ 1060-B1 ⁷	ZONE 9 380,000E 7,537,000N	SAND & GRAVEL (GM-GM) TRACE TO SOME SILT	2	GLACIOFLUVIAL OUTWASH	LOW	GOOD	A) 100,000 B) 1 X 10 ⁶ C) 4 X 10 ⁶	4.5	0-0.6 PEAT SILT	UNDEVELOPED DIFFICULT ACCESS HILLY, THERMALLY SENSITIVE TERRAIN	HIGH SENSITIVITY SURROUNDS SERIES OF LAKES/CARIBOU WINTER RANGE, DENNING AREA	FAIR	GOOD	330	5	A) 610 B) 460 C) 65 D) 30	HIGH
4.21	BD4-28 ⁹	ZONE 9 377,500E 7,537,000N	SAND AND GRAVEL	3	GLACIOFLUVIAL DEPOSIT			B) 500,000 C) 2 X 10 ⁶	12		UNDEVELOPED WINTER ROAD FLAT THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
4.22	BD4-29 ⁹ 1140A ⁴	ZONE 9 376,900E 7,534,900N	CLAY SILTY	NG	LACUSTRINE DEPOSIT		FAIR				UNDEVELOPED	HEADWATER AREA, CARIBOU WINTER RANGE	POOR	UNSUITABLE				LOW
4.23	BD4-30 ⁹ 1141 ⁴ 106N-B2 ⁷	ZONE 8 376,500E 7,534,900N	SAND & GRAVEL (GM-GM) TRACE SILT	2	GLACIOFLUVIAL OUTWASH	LOW	POOR	A) 20,000 B) 400,000 C) 4 X 10 ⁶	4.5	0.6 PEAT & SILT	UNDEVELOPED DIFFICULT ACCESS, HILLY, THERMALLY SENSITIVE TERRAIN	MODERATELY SENSITIVE STRADDLES LAKE DRAINAGE, CARIBOU WINTER RANGE	POOR	FAVOURABLE				MEDIUM
4.24	BD4-27 ⁹ 1142A ⁴	ZONE 8 618,800E 7,536,900N	SILT & SAND GRAVELLY	4	SMALL KAME COMPLEX						UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
4.25	106N-B1 ⁷	ZONE 8 607,500E 7,535,000N	TILL, LOW GRAVEL CONTENT	NG		HIGH	FAIR			THIN	UNDEVELOPED ADJACENT TO CNT LINE	SILTATION OF LAKES & TRAVAILLANT RIVER	POOR	UNSUITABLE				LOW
4.26	BD4-17 ⁹ 1146 ⁴ 107B-B15 ⁷	ZONE 8 630,000E 7,546,000N	SAND & GRAVEL SILTY (SM)	3	GLACIOFLUVIAL OUTWASH PLAIN	LOW TO MEDIUM	GOOD TO FAIR	A) 200,000 B) 10 X 10 ⁶ C) 20 X 10 ⁶	5	0.3-3.0 PEAT	UNDEVELOPED	STRADDLES UPPER TRAVAILLANT RIVER, FISH MIGRATION PASSAGE	FAIR	GOOD	325	5	A) 650 B) 490 C) 65 D) 35	HIGH
4.27	BD4-20 ⁹ 1145A ⁴	ZONE 8 607,000E 7,544,400N	SAND & GRAVEL	4	LARGE KAME COMPLEX			A) 20,000 B) 400,000 C) 5.5 X 10 ⁶	4.5	0.6 PEAT & TILL	UNDEVELOPED WINTER ROAD HILLY THERMALLY SENSITIVE TERRAIN	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
4.28	BD4-58 ⁹ 1143A ⁴	ZONE 8 610,600E 7,535,300N	SAND & GRAVEL (GP-GM) TRACE SILT	3	SMALL KAME		GOOD	A) 2,500 B) 15,000 C) 100,000	6	0.15, MOSS	UNDEVELOPED DIFFICULT ACCESS HILLY, THERMALLY SENSITIVE TERRAIN	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
4.29	BD4-26 ⁹ 1144 ⁴	ZONE 8 606,600E 7,534,400N	SAND & GRAVEL (GM) SILTY	4	KAME TERRACE COMPLEX	MEDIUM	POOR	A) 20,000 B) 400,000 C) 5.5 X 10 ⁶	4	0.6 CLAY	UNDEVELOPED ACCESS DIFFICULT, HILLY, THERMALLY SENSITIVE TERRAIN	HIGH SENSITIVITY LOCATED BETWEEN LAKES, CARIBOU RANGE	POOR	FAVOURABLE				MEDIUM
4.30	1119A ⁴	ZONE 8 619,400E 7,524,000N	CLAY & PEAT	NG			GOOD				UNDEVELOPED	SILTATION OF ADJACENT LAKE	POOR	UNSUITABLE				LOW
4.31	BD4-40 ⁹ 1121 ⁴	ZONE 8 604,000E 7,526,000N	SAND GRAVEL SOME SILT	2	GLACIOFLUVIAL OUTWASH DEPOSIT		GOOD	A) 250,000 B) 25 X 10 ⁶ C) 55 X 10 ⁶	6	0.3 PEAT & SILT	UNDEVELOPED WINTER ACCESS ONLY	HIGH SENSITIVITY DENNING AND AQUATIC HABITAT, SILTATION OF CREEK AND LAKES	POOR	GOOD	275	6	A) 660 B) 495 C) 60 D) 30	HIGH
4.32	BD4-34 ⁹ 1122A ⁴	ZONE 8 607,000E 7,529,200N	SILT CLAYEY SANDY (ML-SC)	NG			FAIR				UNDEVELOPED	HIGH SENSITIVITY CARIBOU WINTER RANGE STRADDLES TRIBUTARY TO POINT LAKE	POOR	UNSUITABLE				LOW
4.33	BD4-41 ⁹ 1123 ⁴	ZONE 8 609,000E 7,525,000N	GRAVEL, SANDY, TRACE SILT	2	GLACIOFLUVIAL OUTWASH DEPOSIT		GOOD	A) 900,000 B) 9 X 10 ⁶ C) 13 X 10 ⁶	4.5	0.45 PEAT	UNDEVELOPED GOOD ACCESS WINTER ROAD ONLY	HIGH SENSITIVITY SHORES OF POINT LAKE, CARIBOU WINTER RANGE	POOR	GOOD	30	5	A) 60 B) 45 C) 6 D) 3	HIGH

TABLE B3: BORROW MANAGEMENT AREA No.4 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORROWHOLES	DEPTH OF BORROWHOLES (M)	LABORATORY TESTING	PRIORITY
4.34	BD4-42 ⁹ 1124A ⁴	ZONE 8 612,500E 7,523,600N	SAND & GRAVEL (GM-SM)	3	GLACIOFLUVIAL OUTWASH DEPOSIT		POOR	A) 800,000 B) 3.5 X 10 ⁶ C) 10 X 10 ⁶	4	1.0 PEAT AND SILT/CLAY	UNDEVELOPED DIFFICULT ACCESS HILLY, THERMALLY SENSITIVE TERRAIN	HIGH SENSITIVITY STRADDLES DRAINAGE SYSTEM, WHISTLING SWANS HABITAT	POOR	FAVOURABLE				MEDIUM
4.35	BD4-35 ⁹ 1127A ⁴	ZONE 8 619,800E 7,526,600N	SAND & GRAVEL (GM) SILTY	3	OUTWASH AND KAMES/ESKERS COMPLEX	LOW	GOOD	A) 1.4 X 10 ⁶ B) 5 X 10 ⁶ C) 12 X 10 ⁶	8	0.15 MOSS	UNDEVELOPED, ACCESS DIFFICULT, HILLY THERMALLY SENSITIVE TERRAIN	STRADDLES TRIBUTARY LAKE SYSTEM CARIBOU WINTER RANGE DENNING/AQUATIC AREA	POOR	FAVOURABLE				MEDIUM
4.36	1139A ⁴ BD4-31 ⁹ 106N-B3 ⁷	ZONE 8 626,000E 7,532,000N	SHALE	NG	BEDROCK ESCARPMENT		GOOD	C) UNLIMITED		6.0 SILTY SAND & GRAVEL	UNDEVELOPED THERMALLY SENSITIVE TERRAIN WINTER ROAD	DENNING AREA, SILTATION OF TRAVAILANT RIVER	POOR	FAVOURABLE				MEDIUM
4.37	BD4-37 ⁹ 1128A ⁴	ZONE 8 625,000E 7,528,000N	SHALE	NG	BEDROCK OUTCROP		GOOD	C) UNLIMITED		3.7 CLAYEY SILT	UNDEVELOPED ACCESS DIFFICULT HILLY, THERMALLY SENSITIVE TERRAIN	SILTATION CONTROL, WINTER RANGE FOR CARIBOU	POOR	FAVOURABLE				MEDIUM
4.38	1138A ⁴ BD4-36 ⁹ 106N-B4 ⁷	ZONE 9 380,000E 7,537,000N	SAND & GRAVEL (GM-GM) TRACE TO SOME SILT	2	KAME TERRACE, OUTWASH PLAIN	LOW	GOOD	A) 2 X 10 ⁶ B) 15 X 10 ⁶ C) 25 X 10 ⁶	4.5	0-0.6 PEAT SILT	UNDEVELOPED DIFFICULT ACCESS HILLY, THERMALLY SENSITIVE TERRAIN	SURROUNDS SERIES OF LAKES, CARIBOU WINTER RANGE AND DENNING AREA	FAIR	GOOD	100	9	A) 360 B) 270 C) 20 D) 10	HIGH
4.39	1137A ⁴ BD4-32 ⁹ 1060-B2 ⁷	ZONE 9 380,000E 7,531,000N	GRAVEL & SAND SOME SILT AND CLAY	2	KAME & KETTLE COMPLEX	LOW	GOOD	A) 7,000 B) 150,000 C) 1 X 10 ⁶	6	0.6 MOSS	UNDEVELOPED DIFFICULT ACCESS HILLY, THERMALLY SENSITIVE TERRAIN	STRADDLES CREEK DRAINAGE, AQUATIC HABITATS	FAIR	GOOD	95	5-20	A) 770 B) 575 C) 20 D) 10	HIGH
4.40	BD4-33 ⁹	ZONE 9 384,000E 7,530,000N	SAND AND GRAVEL	3	GLACIOFLUVIAL TERRACES, CHANNELLED			B) 1.5 X 10 ⁶ C) 7.5 X 10 ⁶	12		UNDEVELOPED WINTER ROAD FLAT THERMOKARST TERRAIN	SILTATION OF ADJACENT LAKES	NONE	FAVOURABLE				MEDIUM
4.41	1130A ⁴	ZONE 9 382,500E 7,525,000N	CLAY (CL)	NG							UNDEVELOPED	SILTATION OF ADJACENT LAKES	POOR	UNSUITABLE				LOW
4.42	BD4-30 ⁹ 1131A ⁴	ZONE 9 394,500E 7,525,000N	CLAY (TILL) GLACIAL TILL	NG	LARGE DELTAIC FEATURE		GOOD	C) 7.5 X 10 ⁶			UNDEVELOPED DIFFICULT HILLY THERMALLY SENSITIVE TERRAIN	SILTATION OF LARGE LAKE WHISTLING SWAN HABITAT	POOR	UNSUITABLE				LOW
4.43	BD5-6 ⁹ 1132A ⁴	ZONE 9 402,600E 7,526,400N	CLAYEY SAND (SC)	NG			GOOD				UNDEVELOPED	SILTATION OF ADJACENT LAKE	POOR	UNSUITABLE				LOW
4.44	BD5-4 ⁹	ZONE 9 406,000E 7,530,000N	SAND AND GRAVEL	3	GLACIOFLUVIAL TERRACE AND HUMMOCKY DEPOSIT			B) 2.5 X 10 ⁶ C) 10 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD ROLLING TO FLAT THERMOKARST TERRAIN	SILTATION OF ADJACENT LAKES	NONE	FAVOURABLE				MEDIUM
4.45	BD5-9 ⁹	ZONE 9 405,000E 7,523,000N	SAND AND GRAVEL	3	GLACIOFLUVIAL TERRACE			B) 4 X 10 ⁶ C) 15 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD ROLLING TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
4.46	BD5-7 ⁹	ZONE 9 411,000E 7,526,500N	SAND AND GRAVEL	3	GLACIOFLUVIAL TERRACE AND HUMMOCKY DEPOSIT			B) 5 X 10 ⁶ C) 20 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD ROLLING TERRAIN	ADJACENT TO THE SOUTH SHORE OF TENLEN LAKE	NONE	FAVOURABLE				MEDIUM
4.47	BD5-10 ⁹ 1136A ⁴	ZONE 9 421,000E 7,521,000N	SAND & GRAVEL (SM-GM)	4	GLACIOFLUVIAL TERRACE		POOR	A) 2 X 10 ⁶ B) 8 X 10 ⁶ C) 10 X 10 ⁶	9	0.3 PEAT & SILT	UNDEVELOPED DIFFICULT HILLY, THERMOKARST TERRAIN	MODERATE SENSITIVITY PARALLELS LAKE EDGE	POOR	UNSUITABLE				LOW
4.48	BD5-11 ⁹	ZONE 9 423,000E 7,521,700N	SAND & GRAVEL	3	GLACIOFLUVIAL RIDGES			B) 750,000 C) 3 X 10 ⁶	4.5		UNDEVELOPED FLAT TO ROLLING THERMOKARST TERRAIN	SILTATION OF ADJACENT LAKE	NONE	FAVOURABLE				MEDIUM
4.49	BD5-14 ⁹ 1135A ⁴	ZONE 9 421,500E 7,515,500N	SAND & GRAVEL (GM) SOME SILT	2	GLACIOFLUVIAL OUTWASH DEPOSIT		FAIR	A) 950,000 B) 8 X 10 ⁶ C) 15 X 10 ⁶	7.5	0.3 PEAT & SILT	UNDEVELOPED DIFFICULT ACCESS HILLY, THERMALLY SENSITIVE TERRAIN	MODERATELY LOW SENSITIVITY, STRADDLES LAKE DRAINAGE	POOR	GOOD	170	5-10	A) 525 B) 400 C) 40 D) 20	HIGH

TABLE B3: BORROW MANAGEMENT AREA No.4 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BOREHOLES	DEPTH OF BOREHOLES (M)	LABORATORY TESTING	PRIORITY
4.50	BDS-18 ⁹	ZONE 9 423,000E 7,510,000N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSIT			B) 2.5 X 10 ⁶ C) 10 X 10 ⁶	4.5		UNDEVELOPED FLAT TO ROLLING THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
4.51	BDS-17 ⁹ 1134A ⁴	ZONE 9 417,600E 7,512,500N	CLAY, TRACE GRAVEL, COBBLES	NG	GLACIAL TILL DEPOSIT		GOOD				UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
4.52	BDS-13 ⁹ 1133A ⁴	ZONE 9 414,000E 7,515,600N	SAND, SOME GRAVEL SOME SILT (SM-SM)	3	GLACIOFLUVIAL OUTWASH DEPOSIT		GOOD	A) 45,000 B) 300,000 C) 2.5 X 10 ⁶	4.5	0.3 PEAT & SILT	UNDEVELOPED HILLY/THERMALLY SENSITIVE TERRAIN	LOW SENSITIVITY SILTATION OF LAKE	POOR	FAVOURABLE				MEDIUM
4.53	BDS-75 ⁹	ZONE 9 412,000E 7,519,500N	SAND & GRAVEL	3	GLACIOFLUVIAL TERRACE			B) 4 X 10 ⁶ C) 15 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD ROLLING TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
4.54	BDS-25 ⁹ 1092A ⁴	ZONE 9 416,000E 7,502,500N	SHALE	NG	BEDROCK OUTCROP	HIGH	FAIR TO GOOD	C) UNLIMITED		2.0-5.0, CLAY & SHALE	UNDEVELOPED ACCESS NOT DIFFICULT	LOW SENSITIVITY	POOR	FAVOURABLE				MEDIUM
4.55	BDS-24 ⁹	ZONE 9 400,000E 7,507,500N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSIT			B) 500,000 C) 2.5 X 10 ⁶	6		UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	SILTATION OF ADJACENT LAKE	NONE	FAVOURABLE				MEDIUM
4.56	BDS-20 ⁹ 1096A ⁴	ZONE 9 394,300E 7,507,900N	GRAVEL & SAND (GM-GM)	3	RIDGED CREVASSE FILLING		FAIR	A) 50,000 B) 500,000 C) 1 X 10 ⁶	3	0-1.0 PEAT, MOSS SILT	UNDEVELOPED ACCESS NOT DIFFICULT	MODERATELY SENSITIVE SURROUNDS UPLAND LAKES	POOR	FAVOURABLE				MEDIUM
4.57	BDS-21 ⁹ 1097A ⁴	ZONE 9 395,500E 7,511,600N	CLAY AND SAND (SC) TRACE GRAVEL	NG							UNDEVELOPED	SILTATION OF ADJACENT LAKE	POOR	UNSUITABLE				LOW
4.58	1095A ⁴ BDS-23 ⁹	ZONE 9 394,300E 7,502,600N	SAND (GM-SM) & GRAVELLY SAND	3	GLACIOFLUVIAL OUTWASH OVERLAIN BY CLAY		GOOD	A) 300,000 B) 2 X 10 ⁶ C) 3 X 10 ⁶	2	1.3 CLAY	UNDEVELOPED THERMALLY SENSITIVE ROLLING TERRAIN	MODERATELY SENSITIVE LAKE COMPLEX, SWANS SPRING STAGING & MOULTING AREA	POOR	FAVOURABLE				MEDIUM
4.59	1098A ⁴ 1060-B3 ⁷ BDS-22 ⁹	ZONE 9 393,000E 7,513,000N	SANDY GRAVEL (GM-GM) TRACE OF SILT	2	KANE & KETTLE COMPLEX	LOW	GOOD	A) 700,000 B) 8 X 10 ⁶ C) 20 X 10 ⁶	9	NONE	UNDEVELOPED GOOD ACCESS DURING WINTER	MODERATELY SENSITIVE SURROUNDS UPLAND LAKE	POOR	GOOD	450	10	A) 1650 B) 1250 C) 100 D) 50	HIGH
4.60	BD4-51 ⁹	ZONE 9 389,000E 7,517,000N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSIT			B) 250,000 C) 1 X 10 ⁶	6		UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	SILTATION OF ADJACENT LAKE	NONE	FAVOURABLE				MEDIUM
4.61	BD4-52 ⁹ 1099A ⁴	ZONE 9 388,800E 7,515,200N	SILTSTONE	NG	BEDROCK OUTCROP		GOOD			1.5 SILT	UNDEVELOPED ACCESS DIFFICULT THERMALLY SENSITIVE TERRAIN	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
4.62	1129A ⁴	ZONE 9 379,800E 7,521,000N	CLAY (CL)	NG			FAIR				UNDEVELOPED	SILTATION OF TRAVAILLANT RIVER	POOR	UNSUITABLE				LOW
4.63	BD4-44 ⁹	ZONE 8 620,000E 7,521,500N	SAND & GRAVEL	3	GLACIOFLUVIAL OUTWASH PLAIN			B) 9 X 10 ⁶ C) 35 X 10 ⁶	11		UNDEVELOPED FLAT/ROLLING THERMOKARST TERRAIN	SILTATION OF ADJACENT LAKE	NONE	FAVOURABLE				MEDIUM
4.64	1126A ⁴	ZONE 8 616,000E 7,520,000N	SAND & GRAVEL (GM-GM) TRACE SILT	2	SCATTERED ESKERS		GOOD	B) 80,000 C) 100,000	1	THIN	UNDEVELOPED HILLY THERMALLY SENSITIVE TERRAIN	HIGH SENSITIVITY WHISTLING SWAN HABITAT	POOR	GOOD	10	3-5	A) 20 B) 15 C) 2 D) 1	HIGH
4.65	BD4-48 ⁹	ZONE 8 618,000E 7,518,500N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSIT			B) 5 X 10 ⁶ C) 20 X 10 ⁶	11		UNDEVELOPED WINTER ROAD SLIGHT THERMOKARST FEATURES	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM

TABLE B3: BORROW MANAGEMENT AREA No.4 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORROWHOLES	DEPTH OF BORROWHOLES (M)	LABORATORY TESTING	PRIORITY
4.66	BD4-49 ⁹	ZONE 8 614,000E 7,516,000N	GRAVEL, SOME SAND, TRACE SILT & CLAY	3	GLACIOFLUVIAL OUTWASH PLAIN			B) 8 X 10 ⁶ C) 35 X 10 ⁶	11		UNDEVELOPED WINTER ROAD FLAT/ROLLING THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
4.67	BD4-46 ⁹ 1120 ⁴	ZONE 8 605,200E 7,519,400N	SAND & GRAVEL (GM) SOME SILT	2	GLACIOFLUVIAL OUTWASH DEPOSIT		GOOD	A) 350,000 B) 2 X 10 ⁶ C) 2.5 X 10 ⁶	3	0.6 PEAT, SILT AND CLAY	UNDEVELOPED THERMALLY SENSITIVE, HILLY TERRAIN	HIGH SENSITIVITY SILTATION OF CREEK AND LAKE SYSTEMS, DENNING HABITAT	POOR	GOOD	25	3-5	A) 40 B) 30 C) 5 D) 3	HIGH
4.68	1112A ⁴	ZONE 8 596,000E 7,512,000N	SHALE	NG	BEDROCK OUTCROP		FAIR			6.0 PEAT & TILL	UNDEVELOPED THERMALLY SENSITIVE TERRAIN	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
4.69	1111A ⁴	ZONE 8 598,000E 7,507,000N	SILT	NG			FAIR				UNDEVELOPED	SILTATION OF ADJACENT LAKE	POOR	UNSUITABLE				LOW
4.70	26 ¹⁰	ZONE 8 603,000E 7,506,500N	GRAVEL (SM)	4		HIGH				2.3	UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
4.71	1110A ⁴	ZONE 8 585,000E 7,500,000N	SAND & SILT	4			GOOD				UNDEVELOPED	MODERATELY SENSITIVE	POOR	UNSUITABLE				LOW
4.72	1109A ⁴	ZONE 8 602,500E 7,497,500N	SILT	NG			GOOD				UNDEVELOPED	SILTATION OF IN AND OUT LAKE	POOR	UNSUITABLE				LOW
4.73	1072A ⁴	ZONE 8 605,500E 7,489,000N	SILT	NG							UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
4.74	1073 ⁴	ZONE 8 606,000E 7,486,000N	SILT, SAND SOME GRAVEL (SM)	3	SMALL KAME COMPLEX		GOOD	A) 25,000 B) 3.5 X 10 ⁶ C) 3.5 X 10 ⁶	3		UNDEVELOPED	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
4.75	1074 ⁴	ZONE 8 611,500E 7,492,000N	SANDY SILT TRACE OF GRAVEL	4	LARGE KAME COMPLEX		GOOD				UNDEVELOPED	SILTATION OF BIG STONE LAKE	POOR	UNSUITABLE				LOW
4.76	1103A ⁴	ZONE 8 612,000E 7,497,000N	SHALE	NG	BEDROCK OUTCROP		FAIR			7.6 CLAY AND WEATHERED SHALE	UNDEVELOPED	LOW SENSITIVITY ADJACENT TO LOCHE LAKE	POOR	FAVOURABLE				MEDIUM
4.77	1108A ⁴	ZONE 8 611,000E 7,504,000N	GRAVEL & CLAY	4	KAME COMPLEX		GOOD				UNDEVELOPED	SOUTH SHORE OF BATHING LAKE WHISTLING SWAN HABITAT	POOR	UNSUITABLE				LOW
4.78	1105 ⁴	ZONE 8 612,500E 7,507,500N	GRAVEL & SAND (GP-GM) TRACE SILT	3	GLACIOFLUVIAL OUTWASH		GOOD	A) 10,000 B) 200,000 C) 200,000	1.5	THIN	UNDEVELOPED ACCESS IN WINTER NOT DIFFICULT	HIGH SENSITIVITY, ISLAND, WHISTLING SWAN HABITAT	POOR	FAVOURABLE				MEDIUM
4.79	1107 ⁴	ZONE 8 610,500E 7,509,900N	GRAVEL (GM) WITH SANDY SILT	2	KAME, ESKEER COMPLEX		GOOD	A) 10,000 B) 750,000 C) 750,000	1.5	THIN TOPSOIL	UNDEVELOPED HILLY TERRAIN AND LAKE, DIFFICULT ACCESS	NORTH SHORE OF BATHING LAKE, WHISTLING SWANS HABITAT	POOR	GOOD	240	5	A) 450 B) 330 C) 50 D) 25	HIGH
4.80	1106A ⁴	ZONE 8 614,000E 7,507,000N	SILT	NG			GOOD				UNDEVELOPED	SILTATION OF DEEP LAKE	POOR	UNSUITABLE				LOW
4.81	1104 ⁴	ZONE 8 613,500E 7,505,000N	SAND & GRAVEL (GM-SM) SILTY	3	GLACIOFLUVIAL OUTWASH PLAIN		GOOD	A) 200,000 B) 11 X 10 ⁶ C) 20 X 10 ⁶	3	0-1.3 PEAT & CLAY	UNDEVELOPED ACCESS NOT DIFFICULT	HIGH SENSITIVITY WHISTLING SWAN HABITAT FISHERY & WILDLIFE VALUES	POOR	GOOD	265	3-5	A) 425 B) 320 C) 50 D) 25	HIGH

TABLE B3: BORROW MANAGEMENT AREA No.4 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION					DATA QUALITY RELIABILITY		RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORROWHOLES	DEPTH OF BORROWHOLES (M)	LABORATORY TESTING	PRIORITY
4.82	BD4-53 ⁹ 1102 ⁴	ZONE 8 620,000E 7,506,800N	GRAVEL & SAND (GW-SM) SOME SILT	3	SMALL KAMES		GOOD	A) 30,000 B) 500,000 C) 2.5 X 10 ⁶	6	0.3-1.3 TOPSOIL & TILL	UNDEVELOPED THERMOKARST HILLS/RIDGES DIFFICULT ACCESS	MODERATELY SENSITIVE S.W. SHORE OF JIGGLE LAKE	POOR	FAVOURABLE				MEDIUM
4.83	BD4-54 ⁹	ZONE 8 625,000E 7,506,000N	SILT, SAND & GRAVEL MIXTURE (GLACIAL TILL)	4	MORAINAL SHEET			C) 2 X 10 ⁶	9		UNDEVELOPED	SILTATION OF JIGGLE LAKE, BEAVER & MUSKRAT HABITAT	NONE	UNSUITABLE				LOW
4.84	BD4-55 ⁹ 1101 ⁴	ZONE 8 627,000E 7,508,000N	SANDY GRAVEL (GW) SOME SILT	2	GLACIOFLUVIAL OUTWASH AND KAME DEPOSIT		GOOD	A) 30,000 B) 650,000 C) 4 X 10 ⁶	4.5	0.15	UNDEVELOPED WINTER ROAD ACCESS THERMOKARST TERRAIN	ADJACENT TO EAST ARM OF JIGGLE LAKE, WHISTLING SWANS HABITAT	POOR	GOOD	375	5	A) 700 B) 525 C) 80 D) 40	HIGH
4.85	BD4-56 ⁹ 1100 ⁴	ZONE 9 374,000E 7,503,500N	SHALE HARD	NG	BEDROCK OUTCROP		GOOD	C) UNLIMITED		2.7 SHALE & CLAY	UNDEVELOPED THERMALLY SENSITIVE TERRAIN WINTER ROAD	MODERATELY SENSITIVE UPLAND AREA WEST OF TRAVAILLANT LAKE	POOR	FAVOURABLE				MEDIUM
4.86	1076 ⁴	ZONE 8 621,500E 7,496,000N	SAND & GRAVEL	2	GLACIOFLUVIAL TERRACE		GOOD	A) 75,000 B) 2 X 10 ⁶ C) 3 X 10 ⁶	2.5	0.5 PEAT	UNDEVELOPED	MODERATELY SENSITIVE	POOR	GOOD	60	5	A) 110 B) 85 C) 15 D) 7	HIGH
4.87	1075A ⁴	ZONE 8 616,500E 7,491,500N	SILT	NG							UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
4.88	1077A ⁴	ZONE 8 623,500E 7,488,500N	SHALE AND CLAY OVER LIMESTONE	NG	BEDROCK OUTCROP		GOOD			8.5 CLAY	UNDEVELOPED THERMALLY SENSITIVE TERRAIN	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
4.89	1079 ⁴	ZONE 9 372,500E 7,491,000N	SHALE	NG	BEDROCK OUTCROP		GOOD			4.3, CLAY	UNDEVELOPED THERMALLY SENSITIVE TERRAIN	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
4.90	1078 ⁴	ZONE 8 626,000E 7,496,500N	SHALE	NG	BEDROCK OUTCROP		GOOD			THICK	UNDEVELOPED THERMALLY SENSITIVE TERRAIN	MODERATELY SENSITIVE SILTATION TO TRAVAILLANT RIVER	NONE	FAVOURABLE				MEDIUM
4.91	1080 ⁴	ZONE 9 377,000E 7,492,000N	SHALE	NG	BEDROCK OUTCROP		GOOD			4.3 CLAY & SHALE	UNDEVELOPED THERMALLY SENSITIVE TERRAIN	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
4.92	1081 ⁴	ZONE 9 381,000E 7,492,500N	SHALE	NG	BEDROCK OUTCROP		GOOD			4.19 CLAY & SHALE	UNDEVELOPED	LOW SENSITIVITY TRAPPING AREA, SILTATION OF TRAVAILLANT RIVER	POOR	FAVOURABLE				MEDIUM
4.93	BDS-32 ⁹	ZONE 9 393,000E 7,507,000N	SAND & GRAVEL	3	TERRACED GLACIOFLUVIAL DEPOSIT			B) 2.5 X 10 ⁶ C) 7.5 X 10 ⁶	6		UNDEVELOPED WINTER ROAD ROLLING TERRAIN THERMOKARST	SILTATION OF ADJACENT LAKE	NONE	FAVOURABLE				MEDIUM
4.94	1094 ⁴ BDS-80 ⁹	ZONE 9 386,300E 7,502,600N	SHALE	NG	BEDROCK OUTCROP		FAIR	C) UNLIMITED		4.6 CLAY/ WEATHERED SHALE	UNDEVELOPED RELATIVELY EASY ACCESS	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
4.95	BDS-31 ⁹	ZONE 9 389,000E 7,505,000N	SAND & GRAVEL	3	TERRACED GLACIOFLUVIAL DEPOSIT			B) 2.5 X 10 ⁶ C) 10 X 10 ⁶			UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
4.96	1093 ⁴ BDS-33 ⁹	ZONE 9 392,000E 7,502,200N	SHALE	NG	BEDROCK RIDGE		FAIR TO GOOD	C) UNLIMITED		1.3-2.5 CLAY & SOFT SHALE	UNDEVELOPED THERMALLY SENSITIVE ROLLING TERRAIN	LOW SENSITIVITY, FISHERIES ON RIVER	FAIR TO GOOD	FAVOURABLE				MEDIUM
4.97	1082 ⁴ BDS-44 ⁹	ZONE 9 389,000E 7,496,400N	SAND & GRAVEL SANDY GRAVEL (GW)	3	KAME COMPLEX	HIGH	FAIR	A) 25,000 B) 250,000 C) 400,000	5.5	1.0 SAND/ SILT	UNDEVELOPED THERMALLY SENSITIVE ROLLING TERRAIN	MODERATELY SENSITIVE	POOR	FAVOURABLE				MEDIUM

TABLE B3: BORROW MANAGEMENT AREA No.4 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BOREHOLES	DEPTH OF BOREHOLES (M)	LABORATORY TESTING	PRIORITY
4.98	BDS-42 ⁹	ZONE 9 393,500E 7,500,000N	SAND AND GRAVEL	3	GLACIOFLUVIAL DEPOSIT			B) 5 X 10 ⁶ C) 25 X 10 ⁶			UNDEVELOPED ROLLING TERRAIN THERMOKARST FEATURES	SILTATION OF TRAVAILLANT RIVER	NONE	FAVOURABLE				MEDIUM
4.99	1083A ⁴ BDS-43 ⁹	ZONE 9 397,200E 7,497,500N	SAND & SILT (SM-ML)	NG			FAIR TO GOOD			THIN	UNDEVELOPED	SILTATION OF TRAVAILLANT RIVER	POOR	UNSUITABLE				LOW
4.100	1091 ⁴ BDS-30 ⁹	ZONE 9 416,000E 7,502,500N	SHALE	NG	BEDROCK OUTCROP		FAIR TO GOOD	C) UNLIMITED		2.1-4.6 CLAY/WEATHERED SHALE	UNDEVELOPED	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
4.101	BDS-34 ⁹	ZONE 9 424,000E 7,501,000N	SAND & GRAVEL	3	ESKER RIDGES			B) 1 X 10 ⁶ C) 6 X 10 ⁶	3		UNDEVELOPED ROLLING/FLAT THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
4.102	1090 ⁴ BDS-35 ⁹	ZONE 9 421,000E 7,499,000N	SHALE	NG	BEDROCK OUTCROP		FAIR			2.1-4.6	UNDEVELOPED THERMALLY SENSITIVE TERRAIN	MODERATELY SENSITIVE	POOR	FAVOURABLE				MEDIUM
4.103	1089 ⁴ BDS-41 ⁹	ZONE 9 422,000E 7,493,000N	SAND (SP-SM) TRACE SILT	3	KAME/KAME TERRACE COMPLEX		GOOD	A) 150,000 B) 2.5 X 10 ⁶ C) 5.5 X 10 ⁶	7.5	0.3 ORGANICS	UNDEVELOPED	IMPORTANT FISH SPAWNING AREA, DENNING AND MIGRATION AREA	POOR	FAVOURABLE				MEDIUM
4.104	1084 ⁴ 1060. B4 ⁷	ZONE 9 420,000E 7,490,000N	SAND & GRAVEL (SM) SILTY	3	KAME TERRACE OUTWASH PLAIN & FLUVIAL TERRACE	LOW	POOR TO FAIR	A) 25,000 B) 1.5 X 10 ⁶ C) 10 X 10 ⁶	4.5	THIN TOPSOIL	UNDEVELOPED, WINTER ACCESS GOOD, BARGE IN SUMMER	FISH MIGRATION BEAR DENNING, RAPTOR NESTING, NATIVE USE AREA.	FAIR	FAVOURABLE				MEDIUM
4.105	1063A ⁴ BDS-55 ⁹	ZONE 9 412,500E 7,484,000N	SAND (SM) LITTLE SILT	4	RIVER TERRACE ALONG MACKENZIE RIVER		GOOD	A) 55,000 B) 10 X 10 ⁶ C) 20 X 10 ⁶	8.0	0.15 MOSS & PEAT	UNDEVELOPED DIFFICULT ACCESS	HIGH SENSITIVITY WEST BANK OF MACKENZIE RIVER	POOR	UNSUITABLE				LOW
4.106	1064A ⁴	ZONE 9 394,500E 7,478,500N	SILT	NG							UNDEVELOPED SOUTH SIDE MACKENZIE RIVER	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
4.107	BDS-56 ⁹	ZONE 9 406,500E 7,480,000N	SAND & GRAVEL	3	GLACIOFLUVIAL TERRACE			B) 5 X 10 ⁶ C) 20 X 10 ⁶	4		UNDEVELOPED EXTENSIVE THERMOKARST FEATURES	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
4.108	BDS-57 ⁹	ZONE 9 406,000E 7,476,500N	SAND, SOME GRAVEL TRACE SILT & CLAY	3	GLACIOFLUVIAL DEPOSIT			B) 5 X 10 ⁶ C) 25 X 10 ⁶	4		UNDEVELOPED ROLLING/EXTREME THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
4.109	1062 ⁴ BDS-58 ⁹	ZONE 9 411,500E 7,478,500N	SAND & GRAVEL (GM) SILTY	3	GLACIALFLUVIAL OUTWASH		GOOD	A) 20,000 B) 2 X 10 ⁶ C) 7.5 X 10 ⁶	6	0.4 PEAT & MOSS	UNDEVELOPED CLIFFS, WINTER ROAD/BARGES IN SUMMER	MODERATELY SENSITIVE MOOSE WINTER HABITAT & DENNING AREAS	POOR	GOOD	250	6	A) 600 B) 450 C) 50 D) 25	HIGH
4.110	1061 ⁴	ZONE 9 424,000E 7,467,000N	SAND & GRAVEL (GW-GM)	2	GLACIOFLUVIAL OUTWASH			A) 60,000 B) 6 X 10 ⁶ C) 20 X 10 ⁶	4.5	THIN	UNDEVELOPED WINTER ROAD BARGE-SUMMER RIVER CROSSING	MODERATELY SENSITIVE MOOSE WINTER HABITAT & DENNING AREAS	POOR	GOOD	1750	5	A) 3200 B) 2400 C) 350 D) 175	HIGH
4.111	BD4-43 ⁹ 1125 ⁴	ZONE 8 614,000E 7,522,400N	GRAVEL & SAND (GM) SOME SILT	3	GLACIOFLUVIAL OUTWASH		GOOD	A) 20,000 B) 400,000 C) 4 X 10 ⁶	4.5	THIN TOPSOIL	UNDEVELOPED DIFFICULT ACCESS HILLY, THERMALLY SENSITIVE TERRAIN	SHORE OF SANDY LAKE, WHISTLING SWAN HABITAT	POOR	FAVOURABLE				MEDIUM
4.112	BD4-50 ⁹	ZONE 8 620,500E 7,513,000N	SAND	3	GLACIOFLUVIAL DEPOSIT			B) 1 X 10 ⁶ C) 5 X 10 ⁶	11		UNDEVELOPED THERMOKARST TERRAIN AND LAKE	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM

TABLE B4: BORROW MANAGEMENT AREA No.5 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BOREHOLES	DEPTH OF BOREHOLES (M)	LABORATORY TESTING	PRIORITY
5.01	BDS-5 ⁹	ZONE 9 445,000E 7,530,000N	SAND & GRAVEL	3	GLACIOFLUVIAL TERRACES			B) 2 X 10 ⁶ C) 7.5 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
5.02	BDS-8 ⁹	ZONE 9 437,500E 7,525,000N	SAND & GRAVEL	3	GLACIOFLUVIAL TERRACES			B) 4 X 10 ⁶ C) 15 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
5.03	BDS-16 ⁹	ZONE 9 445,000E 7,515,000N	SAND & GRAVEL	3	GLACIOFLUVIAL TERRACES			B) 1 X 10 ⁶ C) 4.5 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD ROLLING TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
5.04	BDS-15 ⁹	ZONE 9 441,000E 7,514,000N	GRAVEL	3	GLACIOFLUVIAL TERRACE			B) 2 X 10 ⁶ C) 7 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD ROLLING TERRAIN	SILTATION OF TRIBUTARY TO THUNDER RIVER	NONE	FAVOURABLE				MEDIUM
5.05	BDS-26 ⁹	ZONE 9 434,000E 7,508,000N	SAND & GRAVEL	3	GLACIOFLUVIAL TERRACES			B) 2 X 10 ⁶ C) 7.5 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD ROLLING TERRAIN	SILTATION OF THUNDER RIVER	NONE	FAVOURABLE				MEDIUM
5.06	BDS-29 ⁹	ZONE 9 431,000E 7,503,500N	SAND & GRAVEL	3	GLACIOFLUVIAL HUMMOCKS & TERRACES			B) 1.5 X 10 ⁶ C) 6 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD ROLLING TERRAIN	SILTATION OF THUNDER RIVER	NONE	FAVOURABLE				MEDIUM
5.07	BDS-27 ⁹	ZONE 9 452,000E 7,507,000N	SAND & GRAVEL	3	GLACIOFLUVIAL TERRACE			B) 2 X 10 ⁶ C) 7.5 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD ROLLING TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
5.08	BDS-28 ⁹	ZONE 9 445,000E 7,505,000N	SAND & GRAVEL	3	GLACIOFLUVIAL HUMMOCKS			B) 900,000 C) 4.5 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD ROLLING TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
5.09	BDS-36 ⁹	ZONE 9 423,000E 7,510,000N	SAND & GRAVEL	3	GLACIOFLUVIAL TERRACE			B) 1.6 X 10 ⁶ C) 6.5 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD, ROLLING TERRAIN THERMOKARST	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
5.10	1088 ⁴ BDS-37 ⁹	ZONE 9 439,200E 7,495,100N	SAND, LITTLE SILT, TRACE GRAVEL (SM)	4	KAME TERRACE			A) 550,000 B) 5.5 X 10 ⁶ C) 8 X 10 ⁶	5	0.3 PEAT & SILT	UNDEVELOPED WINTER ROAD, THERMOKARST TERRAIN	MODERATELY TO HIGHLY SENSITIVE AREA	POOR	UNSUITABLE				LOW
5.11	BDS-38 ⁹ BDS-39 ⁹	ZONE 9 434,000E 7,495,000N	GRAVEL & SAND	2-3	GLACIOFLUVIAL PLAIN W/GRAVEL MOUNDS		GOOD	B) 1 X 10 ⁶ C) 5.5 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	SILTATION OF THUNDER RIVER	NONE	GOOD	130	5	A) 260 B) 200 C) 30 D) 15	HIGH
5.12	BDS-46 ⁹	ZONE 9 421,000E 7,487,000N	SAND & GRAVEL	3	GLACIOFLUVIAL PLAIN (CHANNELLED)			B) 5 X 10 ⁶ C) 20 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD, FLAT THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
5.13	1085 ⁴ 1060.85 ⁷ BDS-47 ⁹	ZONE 9 421,200E 7,486,600N	SAND, GRAVELLY TRACE SILT (SM-SM)	3	KAMES & GLACIOFLUVIAL OUTWASH	LOW	FAIR TO GOOD	A) 70,000 B) 1.5 X 10 ⁶ C) 2 X 10 ⁶	2.5	0.3 PEAT & SILT	UNDEVELOPED GOOD ACCESS, SUMMER BARGE, WINTER ROAD	MODERATELY SENSITIVE SILTATION OF LAKES	GOOD	FAVOURABLE				MEDIUM
5.14	1086 ⁴ BDS-48 ⁹	ZONE 9 425,200E 7,486,500N	SAND, SOME SILT, TRACE GRAVEL (SP-SM)	3	SMALL KAME COMPLEX	MEDIUM	GOOD	A) 150,000 B) 1.5 X 10 ⁶ C) 2 X 10 ⁶	7.5	0.15 PEAT	UNDEVELOPED ACCESS FAIRLY GOOD	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
5.15	1087 ⁴ BDS-50 ⁹	ZONE 9 425,200E 7,486,500N	GRAVEL & SAND, VARIABLE SILT (GM)	3	SMALL KAME COMPLEX	MEDIUM	GOOD	A) 25,000 B) 50,000 C) 70,000	4.5	0-0.3 PEAT	UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
5.16	BDS-51 ⁹	ZONE 9 433,000E 7,483,000N	SAND & GRAVEL	3	GLACIOFLUVIAL OUTWASH (HUMMOCKY)			B) 1 X 10 ⁶ C) 4 X 10 ⁶	12		UNDEVELOPED WINTER ROAD FLAT-ROLLING TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM

TABLE B4: BORROW MANAGEMENT AREA No.5 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION					DATA QUALITY RELIABILITY		RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS			NUMBER OF BOREHOLES	DEPTH OF BOREHOLES (M)	LABORATORY TESTING	PRIORITY
5.17	BDS-54 ⁹	ZONE 9 437,700E 7,476,500N	SAND & GRAVEL	3	GLACIOFLUVIAL PLAIN (CHANNELLED)			B) 1.5 X 10 ⁶ C) 6 X 10 ⁶	12		UNDEVELOPED SUMMER + WINTER ROAD FLAT TO ROLLING TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
5.18	1055 ⁴ BDS-65 ⁹	ZONE 9 420,000E 7,469,300N	GRAVEL & SAND, SOME SILT (GP-GM)	2	ESKER	LOW TO MEDIUM	GOOD	A) 45,000 B) 450,000 C) 3.5 X 10 ⁶	6	0.15 PEAT	UNDEVELOPED SUMMER BARGE, WINTER RD, ACROSS MACKENZIE RIVER	NO MAJOR CONCERNS	POOR	GOOD	25	5	A) 50 B) 40 C) 5 D) 3	HIGH
5.19	1061 ⁴ BDS-66 ⁹	ZONE 9 413,500E 7,477,500N	GRAVEL & SAND, SOME SILT (GM-GM)	2-3	GLACIOFLUVIAL OUTWASH	LOW TO MEDIUM	FAIR	A) 10,000 B) 1 X 10 ⁶ C) 4 X 10 ⁶	4.5	0.15 PEAT	UNDEVELOPED WINTER ROAD SUMMER BARGE	MODERATELY SENSITIVE GOOD MOOSE HABITAT	POOR	GOOD	265	5	A) 550 B) 400 C) 50 D) 25	HIGH
5.20	1054 ⁴ BDS-67 ⁹	ZONE 9 424,000E 7,466,400N	GRAVEL, SAND & SILT (GM-GM)	2-3	GLACIOFLUVIAL OUTWASH & ESKER COMPLEX	MEDIUM	GOOD	A) 300,000 B) 1.5 X 10 ⁶ C) 3 X 10 ⁶	6	0-0.6 PEAT & CLAY	UNDEVELOPED WINTER ROAD SUMMER BARGE	NO MAJOR CONCERNS	POOR	GOOD	45	6	A) 110 B) 80 C) 10 D) 5	HIGH
5.21	BDS-68 ⁹	ZONE 9 430,000E 7,462,000N	SAND & GRAVEL	3	KETTLED GLACIOFLUVIAL DEPOSITS			B) 1 X 10 ⁶ C) 5 X 10 ⁶	12		UNDEVELOPED WINTER ROAD SUMMER BARGE	GOOD MOOSE HABITAT	NONE	FAVOURABLE				MEDIUM
5.22	1056 ⁴ BP-105 ⁶ BDS-69 ⁹	ZONE 9 444,000E 7,471,300N	SHALE	NG	BEDROCK OUTCROP	LOW TO MEDIUM	GOOD			0.15-2.1 PEAT, WITH SHALE	UNDEVELOPED HIGH RELIEF WINTER ROAD, BARGE SUMMER	MODERATELY SENSITIVE SILTATION OF MACKENZIE R.	FAIR	UNSUITABLE				LOW
5.23	1060 ⁴ BDS-64 ⁹	ZONE 9 444,500E 7,466,500N	SAND & GRAVEL	3	GLACIOFLUVIAL PLAIN	LOW	FAIR TO GOOD	A) 50,000 B) 4 X 10 ⁶ C) 40 X 10 ⁶	12	0.6-1.0	UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	GOOD MOOSE HABITAT	POOR	FAVOURABLE				MEDIUM
5.24	1057 ⁴ 1060 ⁴ BDS-69 ⁹	ZONE 9 450,000E 7,464,000N	SAND & GRAVEL	2	ESKER RIDGE	LOW	GOOD	A) 1 X 10 ⁶ B) 8 X 10 ⁶ C) 10 X 10 ⁶	9	0.3 SILT	UNDEVELOPED WINTER ROAD HUMMOCKY TERRAIN	NO MAJOR CONCERNS	POOR	GOOD	150	7.5-10	A) 500 B) 375 C) 30 D) 15	HIGH
5.25	BDS-61 ⁹	ZONE 9 443,500E 7,472,000N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSITS			B) 1.5 X 10 ⁶ C) 5.5 X 10 ⁶	12		UNDEVELOPED WINTER ROAD STREAM CROSSING	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
5.26	BDS-53 ⁹	ZONE 9 457,000E 7,478,000N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSITS			B) 400,000 C) 1.5 X 10 ⁶	12		UNDEVELOPED WINTER ROAD STREAM CROSSINGS	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
5.27	1060 ⁴ BDS-52 ⁹	ZONE 9 465,000E 7,480,000N	GRAVEL, SOME SAND, TRACE SILT (GM) SAND (SM-SM)	2	GLACIOFLUVIAL OUTWASH DEPOSIT	LOW TO MEDIUM	GOOD	A) 10 X 10 ⁶ B) 80 X 10 ⁶ C) 150 X 10 ⁶	11	0-0.3 ORGANIC SILT	UNDEVELOPED WINTER ROAD	MODERATELY SENSITIVE SILTATION OF TRIBUTARY TO IROQUOIS RIVER	POOR	GOOD	3250	10	A) 13,000 B) 10,000 C) 650 D) 325	HIGH
5.28	1059A ⁴ BDS-62 ⁹	ZONE 9 462,000E 7,465,800N	CLAY	NG							UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
5.29	1058 ⁴ BDS-63 ⁹	ZONE 9 455,200E 7,466,500N	SHALE	NG	BEDROCK OUTCROP		GOOD	C) UNLIMITED		1.2 CLAY 0.6 WEATHERED SHALE	UNDEVELOPED	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
5.30	BDS-70 ⁹	ZONE 9 454,000E 7,461,000N	GRAVEL	2	GLACIOFLUVIAL RIDGES			B) 750,000 C) 3.5 X 10 ⁶	12		UNDEVELOPED FLAT-ROLLING THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	GOOD	95	10-15	A) 480 B) 360 C) 20 D) 10	HIGH
5.31	BDS-71 ⁹	ZONE 9 454,000E 7,459,000N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSIT			B) 750,000 C) 3 X 10 ⁶	12		UNDEVELOPED FLAT-ROLLING THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
5.32	1052 ⁴ 106P-B5 ⁷ BPS-72 ⁹	ZONE 9 457,400N 7,457,000N	SAND & GRAVEL TRACE SILT (GP-GM)	3	ESKERS & CREVASSE FILLINGS	LOW	GOOD	A) 7,000 B) 70,000 C) 150,000	3	0.15 PEAT	UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	NO MAJOR CONCERNS	POOR	GOOD	10	5	A) 20 B) 15 C) 2 D) 1	HIGH

TABLE B4: BORROW MANAGEMENT AREA No.5 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORROWHOLES	DEPTH OF BORROWHOLES (M)	LABORATORY TESTING	PRIORITY
5.33	BDS-73 ⁹	ZONE 9 454,500E 7,454,500N	SAND & GRAVEL	3	KETTLED GLACIOFLUVIAL PLAIN & ESKERS			B) 1 X 10 ⁶ C) 4.5 X 10 ⁶	12		UNDEVELOPED WINTER ROAD HUMMOCKY TERRAIN	GOOD MOOSE BEAVER & MUSKRAT HABITAT	NONE	FAVOURABLE				MEDIUM
5.34	1053A ⁴ BDS-74 ⁹	ZONE 9 433,000E 7,452,600N	SILT & CLAY (SC)	4							UNDEVELOPED	GOOD MOOSE HABITAT	POOR	UNSUITABLE				LOW
5.35	BD6-1 ⁹	ZONE 9 456,000E 7,450,000N	SAND & GRAVEL	3	GLACIOFLUVIAL PLAIN			B) 2 X 10 ⁶ C) 9 X 10 ⁶	12		UNDEVELOPED WINTER ROAD IRREGULAR TERRAIN	GOOD MOOSE BEAVER & MUSKRAT HABITAT	NONE	FAVOURABLE				MEDIUM
5.36	1049 ⁴ 106P-B1 ⁷ BD6-2 ⁹	ZONE 9 457,500E 7,449,000N	SAND, GRAVEL SILT (GM-SM)	3	ESKERS	LOW	GOOD	A) 20,000 B) 200,000 C) 250,000	5	PEAT VERY THIN	UNDEVELOPED WINTER ROAD IRREGULAR TERRAIN	GOOD MOOSE BEAVER & MUSKRAT HABITAT	POOR	FAVOURABLE				MEDIUM
5.37	1050 ⁴ 106P-B2 ⁷ BD6-3 ⁹	ZONE 9 464,000E 7,448,200N	GRAVEL & SAND, LITTLE SILT (GM)	3	KAME COMPLEX		GOOD	A) 10,000 B) 250,000 C) 1.5 X 10 ⁶	4.5	0.3-1.5 SILTY SAND	UNDEVELOPED WINTER ROAD IRREGULAR TERRAIN	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
5.38	1051A ⁴ BD6-4 ⁹	ZONE 9 468,800E 7,447,600N	SILT TRACE GRAVEL	NG	ESKER						UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
5.39	1048 ⁴ BD6-5 ⁹	ZONE 9 452,200E 7,441,400N	SAND & GRAVEL SOME SILT (SM)	3		LOW	GOOD	A) 70,000 B) 350,000 C) 400,000	7.5	0-0.9 SILT	UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	GOOD MOOSE, BEAVER & MUSKRAT HABITAT	POOR	FAVOURABLE				MEDIUM
5.40	BD6-12 ⁹	ZONE 9 499,000E 7,433,000N	SAND	3	GLACIOFLUVIAL PLAIN			B) 72 X 10 ⁶ C) 72 X 10 ⁶	12		UNDEVELOPED WINTER ROAD, FLAT THERMOKARST TERRAIN	GOOD MOOSE, BEAVER & MUSKRAT HABITAT	NONE	FAVOURABLE				MEDIUM
5.41	1047 ⁴ 127 ⁶ 133/134 ⁶ 106P-B3 ⁷	ZONE 9 456,500E 7,436,000N	SAND (SM) & GRAVEL (GM-GM)	3	FLUVIAL TERRACE	LOW	GOOD	A) 2.5 X 10 ⁶ B) 25 X 10 ⁶ C) 55 X 10 ⁶	5	0.3 SILT	UNDEVELOPED WINTER ROAD, RUGGED TERRAIN	GOOD MOOSE BEAVER & MUSKRAT HABITAT	POOR	GOOD	600	5-15	A) 2400 B) 1800 C) 120 D) 60	HIGH
5.42	1046 ⁴ BD6-6 ⁹	ZONE 9 468,000E 7,442,000N	SAND & GRAVEL, SOME SILT (GM)	3	KAME & KAME TERRACE		GOOD	A) 500,000 B) 4 X 10 ⁶ C) 6 X 10 ⁶	3	NONE	UNDEVELOPED WINTER ROAD IRREGULAR TERRAIN	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
5.43	1045 ⁴ 106P-B4 ⁷ BD6-10 ⁹	ZONE 9 468,000E 7,436,500N	GRAVEL & SAND, TRACE SILT (GM-GM)	2	GLACIOFLUVIAL OUTWASH DEPOSIT	LOW	GOOD	A) 550,000 B) 5.5 X 10 ⁶ C) 30 X 10 ⁶	5	0.3 PEAT & SILT	UNDEVELOPED WINTER ROAD WET THERMOKARST TERRAIN	NO MAJOR CONCERNS	POOR	GOOD	200	5-10	A) 600 B) 450 C) 40 D) 20	HIGH
5.44	1044 ⁴ BD6-7 ⁹	ZONE 9 478,600E 7,442,600N	GRAVEL, SOME SAND, TRACE SILT (GM)	2	GLACIOFLUVIAL OUTWASH		FAIR	A) 500,000 B) 1 X 10 ⁶ C) 3.5 X 10 ⁶	3	0.3 SILT	UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	MODERATELY SENSITIVE ARCHAEOLOGICAL SITES, SILTATION OF LAKE	POOR	GOOD	65	3-5	A) 100 B) 75 C) 15 D) 7	HIGH
5.45	1043A ⁴ BD6-8 ⁹	ZONE 9 482,000E 7,440,800N	NOT DETERMINED	3	COMPLEX OF KNOBS		GOOD	B) 300,000 C) 1.5 X 10 ⁶	3		UNDEVELOPED	LOW SENSITIVITY KNOWN ARCHAEOLOGICAL SITES	POOR	FAVOURABLE				MEDIUM
5.46	1042A ⁴ BD6-9 ⁹	ZONE 9 487,500E 7,439,000N	SILT CLAYEY	NG							UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
5.47	1041A ⁴ BD6-13 ⁹	ZONE 9 492,500E 7,434,000N	GRAVEL, SOME SAND, TRACE SILT (GM-GM)	3	GLACIOFLUVIAL OUTWASH DELTA & ESKER	HIGH	FAIR TO POOR	A) 150,000 B) 3 X 10 ⁶ C) 8 X 10 ⁶	4.5	0.15 SILT & ORGANICS	UNDEVELOPED	MODERATELY SENSITIVE	POOR	FAVOURABLE				MEDIUM

TABLE B5: BORROW MANAGEMENT AREA No.6 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION					DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS			NUMBER OF BORROWHOLES	DEPTH OF BORROWHOLES (M)	LABORATORY TESTING	PRIORITY
6.01	1038 ⁴ BD6-14 ⁹	ZONE 9 474,000E 7,430,500N	SANDY GRAVEL TRACE SILT (GM)	3	GLACIOFLUVIAL OUTWASH	LOW	GOOD	A) 150,000 B) 3 X 10 ⁶ C) 10 X 10 ⁶	4.5	0-0.15 PEAT	UNDEVELOPED THERMOKARST TERRAIN WINTER ROAD	SILTATION OF LAKES & PONDS	POOR	FAVOURABLE				MEDIUM
6.02	BD6-15 ⁹	ZONE 9 474,000E 7,430,000N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSIT			B) 1.6 X 10 ⁶ C) 6.5 X 10 ⁶	12		UNDEVELOPED, WINTER ACCESS, FLAT TERRAIN THERMOKARST	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
6.03	1040A ⁴ BD6-16 ⁹	ZONE 9 504,000E 7,428,200N	LIMESTONE	NG	BEDROCK RIDGES		GOOD	C) UNLIMITED		THICK	UNDEVELOPED WINTER ACCESS	HIGH SENSITIVITY WILDLIFE HABITAT & DOMESTIC USE	NONE	FAVOURABLE				MEDIUM
6.04	BD6-22 ⁹	ZONE 9 528,000E 7,410,500N	SAND & GRAVEL	3	RIDGED GLACIOFLUVIAL DEPOSIT			B) 2.5 X 10 ⁵ C) 7.5 X 10 ⁶	7.5		UNDEVELOPED WINTER ACCESS FLAT-ROLLING TERRAIN	SILTATION OF ROBEY LAKE	NONE	FAVOURABLE				MEDIUM
6.05	1039A ⁴ BD6-17 ⁹	ZONE 9 510,000E 7,423,500N	SILT, SOME SAND, SOME CLAY (SM-ML)	NG			GOOD			NONE	UNDEVELOPED	TRAPPING AND FISHING AREA SILTATION OF MANUEL LAKE	POOR	UNSUITABLE				LOW
6.06	BD6-21 ⁹	ZONE 9 490,000E 7,420,000N	SAND & GRAVEL	3	GLACIOFLUVIAL & ALLUVIAL PLAINS			B) 4 X 10 ⁶ C) 12 X 10 ⁶	7.5		UNDEVELOPED WINTER ACCESS THERMALLY SENSITIVE TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
6.07	1032 ⁴ BD6-20 ⁹	ZONE 8 487,000E 7,419,500N	SAND & GRAVEL TRACE SILT (GP)	3	KAME TERRACE WITH ESKER DEPOSITS	NONE	GOOD	A) 185,000 B) 850,000 C) 3.5 X 10 ⁶	3	0-0.3, MOSS AND SILT	UNDEVELOPED, WINTER ACCESS, POORLY DRAINED TERRAIN	MODERATELY SENSITIVE SILTATION OF YELTEA LAKE	POOR	FAVOURABLE				MEDIUM
6.08	1061-B4 ⁷	ZONE 9 463,000E 7,428,000N	SILT, SANDY, TRACE GRAVEL	NG	KAMES & SMALL ESKER RIDGE		FAIR	B) 4 X 10 ⁶	6	0.3 - 0.6 PEAT & SILT	UNDEVELOPED	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
6.09	1061-B1 ⁷ 1036 ⁴ BD6-18 ⁹ BP-126 ⁶	ZONE 9 458,000E 7,422,500N	GRAVEL, SANDY, SOME SILT (GM)	2	GLACIOFLUVIAL OUTWASH DEPOSITS		GOOD	A) 150,000 B) 3 X 10 ⁶ C) 10 X 10 ⁶	7.5		UNDEVELOPED WINTER ROAD, FLAT POORLY DRAINED TERRAIN, THERMOKARST	SILTATION OF LAKES AND PONDS	FAIR	GOOD	150	6	A) 360 B) 270 C) 30 D) 15	HIGH
6.10	1034 ⁴	ZONE 9 440,000E 7,418,000N	GLACIAL TILL	NG							UNDEVELOPED ACCESS MUST CROSS MACKENZIE RIVER	MODERATELY SENSITIVE WINTER HABITAT (MOOSE) RAPTOR NEST SITES	POOR	UNSUITABLE				LOW
6.11	1061-B1 ⁷ 1035 ⁴ BD6-26 ⁹ 144 ²	ZONE 9 456,000E 7,417,400N	GRAVEL, SOME SAND, TRACE SILT (GM-GM)	2	GLACIOFLUVIAL OUTWASH DEPOSIT		FAIR TO GOOD	A) 300,000 B) 6 X 10 ⁶ C) 10 X 10 ⁶	7.5	0-0.15 MOSS & SILT	UNDEVELOPED WINTER ACCESS, THERMALLY SENSITIVE TERRAIN	MODERATELY SENSITIVE WETLAND COMPLEX (WATERFOWL) SILTATION OF STREAMS & LAKES	FAIR	GOOD	150	6	A) 360 B) 270 C) 30 D) 15	HIGH
6.12	BD6-25 ⁹	ZONE 9 458,500E 7,417,500N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSIT			B) 2.5 X 10 ⁶ C) 10 X 10 ⁶	6		UNDEVELOPED WINTER ACCESS, FLAT TO ROLLING TERRAIN	SILTATION OF STREAMS AND PONDS	NONE	FAVOURABLE				MEDIUM
6.13	1037A ⁴ BD6-19 ⁹	ZONE 9 465,300E 7,421,000N	SILT, CLAYEY, TRACE SAND (C1)	NG	KAME COMPLEX		GOOD				UNDEVELOPED	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
6.14	1061-B5 ⁷ BD6-24 ⁹	ZONE 9 464,000E 7,417,700N	SAND & GRAVEL	3	KAMES & ALLUVIAL PLAIN		GOOD	B) 100,000 C) 1 X 10 ⁶	4.5	THIN	UNDEVELOPED WINTER ROAD ROLLING WET THERMOKARST	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
6.15	BD6-43 ⁹ BPD-140 ⁶	ZONE 9 460,500E 7,414,700N	SHALE	NG	BEDROCK OUTCROP					0.6-2.7 TILL	UNDEVELOPED	NO MAJOR CONCERNS	FAIR	FAVOURABLE				MEDIUM
6.16	1033 ⁴ BD6-27 ⁹	ZONE 9 459,000E 7,410,000N	LIMESTONE	NG	BEDROCK SCARP WITH ESKERS		GOOD	A) 150,000 B) 300,000 C) 400,000	9	0.3 SILT & SAND	UNDEVELOPED WINTER ROAD FLAT TERRAIN SUMMER-BARGE	HIGHLY SENSITIVE DENNING & FISHERY AREA, SILTATION OF PAYNE CREEK	POOR	FAVOURABLE				MEDIUM

TABLE B5: BORROW MANAGEMENT AREA No.6 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION					RECOMMENDATIONS FOR ADDITIONAL WORK					
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORHOLES	DEPTH OF BORHOLES (M)	LABORATORY TESTING	PRIORITY
6.17	1061-B6 ⁷ 1027 ⁴ BD6-32 ⁹	ZONE 9 474,500E 7,405,100N	SILTY SAND & SHALY LIMESTONE	NG	LIMESTONE OUTCROP WITH KAMES		GOOD	C) 700,000 TO UNLIMITED	5		UNDEVELOPED WINTER ROAD FLAT POORLY DRAINED TERRAIN	HIGHLY SENSITIVE SILTATION OF CREEK	POOR	FAVOURABLE				MEDIUM
6.18	1028 ⁴ BD6-31 ⁹	ZONE 9 470,000E 7,405,600N	SHALE	NG			FAIR	C) UNLIMITED		3.7-6.0 TILL & WEATHERED SHALE	UNDEVELOPED, WINTER ROAD, FLAT TO ROLLING TERRAIN	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
6.19	BD6-23 ⁹	ZONE 9 488,000E 7,415,000N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSITS			B) 1.5 X 10 ⁶ C) 5.5 X 10 ⁶	7.5		UNDEVELOPED WINTER ROAD, FLAT, THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
6.20	1029A ⁴ BD6-28 ⁹	ZONE 9 487,500E 7,410,000N	SAND, SOME SILT	4	SMALL ESKERS		GOOD	C) 400,000	3		UNDEVELOPED	SILTATION OF YELTEA LAKE	NONE	UNSUITABLE				LOW
6.21	1030A ⁴ BD6-30 ⁹	ZONE 9 507,600E 7,409,000N	LIMESTONE	NG	LIMESTONE OUTCROP		GOOD			1.5-3.0 CLAY & PEAT	UNDEVELOPED WINTER ROAD, FLAT, POORLY DRAINED TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
6.22	1031A ⁴ BD6-29 ⁹	ZONE 9 518,500E 7,411,000N	LIMESTONE	NG	BEDROCK RIDGE		GOOD	C) UNLIMITED		1.3-3.0 PEAT & CLAY	UNDEVELOPED WINTER ROAD, SLOPING TERRAIN, POORLY DRAINED	MODERATELY SENSITIVE BIRD NESTING CARIBOU WINTER RANGE & MARTEN AREA	POOR	FAVOURABLE				MEDIUM
6.23	BD7-3 ⁹	ZONE 9 524,000E 7,404,500N	SAND & GRAVEL	3	ESKER RIDGE			C) 7,500	10		UNDEVELOPED WINTER ROAD FLAT, THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
6.24	BD7-1 ⁹ BD7-2 ⁹	ZONE 9 539,000E 7,406,000N 7,408,000N	SAND & GRAVEL	3	GLACIOFLUVIAL PLAIN, CHANNELLED			B) 9 X 10 ⁶ C) 90 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD, SLOPING WET TO DRAINED TERRAIN	SILTATION OF BLUEFISH RIVER	NONE	FAVOURABLE				MEDIUM
6.25	BD7-4 ⁹ BD7-6 ⁹	ZONE 9 542,000E 7,402,000N 7,400,000N	SAND & GRAVEL	3	ESKER RIDGES & GLACIOFLUVIAL DEPOSITS			B) 1 X 10 ⁶ C) 4.5 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD, FLAT THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
6.26	BD7-5 ⁹	ZONE 9 539,900E 7,393,500N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSITS			B) 2.5 X 10 ⁶ C) 10 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD, SLOPING FAIRLY WELL DRAINED TERRAIN	SILTATION OF BLUEFISH RIVER	NONE	FAVOURABLE				MEDIUM
6.27	BD7-6 ⁹	ZONE 9 535,000E 7,390,000N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSITS	LOW		B) 2.5 X 10 ⁶ C) 10 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD, FLAT TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
6.28	1014A ⁴ BD7-7 ⁹	ZONE 9 531,000E 7,390,000N	SILT, SOME POCKETS OF SAND	NG	SMALL KAMES & ALLUVIAL TERRACES	MEDIUM TO HIGH	GOOD				UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
6.29	1016 ⁴ BD7-1 ⁹	ZONE 9 518,900E 7,386,500N	GRAVEL, TRACE SAND, AND SILT (GW-GP)	2	ESKER - KAME COMPLEX	LOW	GOOD	A) 2,500 B) 250,000 C) 4.0 X 10 ⁶	8	0.3, PEAT	UNDEVELOPED WINTER ROAD	LOW-SENSITIVITY SILTATION CONTROLS	POOR	GOOD	25	8	A) 80 B) 60 C) 5 D) 3	HIGH
6.30	1017A ⁴ BD7-17 ⁹	ZONE 9 513,300E 7,384,600N	SAND & SILT TRACE GRAVEL (SM)	NG	GLACIOFLUVIAL OUTWASH DEPOSIT	MEDIUM TO HIGH	GOOD				UNDEVELOPED	HIGH-SENSITIVITY ADJACENT TO LOON RIVER	POOR	UNSUITABLE				MEDIUM
6.31	1018 ⁴ BD7-8 ⁹	ZONE 9 504,500E 7,389,500N	LIMESTONE	NG	LIMESTONE RIDGE		GOOD			CLAY, VARIABLE	UNDEVELOPED WINTER ROAD, FLAT TO GENTLY SLOPING TERRAIN	LOW SENSITIVITY SILTATION CONTROLS	POOR	FAVOURABLE				MEDIUM
6.32	1023 ⁴ BD7-10 ⁹	ZONE 9 494,600E 7,389,100N	LIMESTONE	NG	BEDROCK OUTCROP		GOOD				UNDEVELOPED WINTER ROAD, FLAT TERRAIN	SILTATION CONTROLS	NONE	FAVOURABLE				MEDIUM

TABLE B5: BORROW MANAGEMENT AREA No.6 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BOREHOLES	DEPTH OF BOREHOLES (M)	LABORATORY TESTING	PRIORITY
6.33	1061-B8 ⁷ 1025 ⁴ BD6-35 ⁹	ZONE 9 488,000E 7,390,500N	SILT, LITTLE GRAVEL (ML-GM)	4	ESKER	MEDIUM TO HIGH	GOOD	A) 15,000 B) 350,000 C) 1 X 10 ⁶	6	NONE	UNDEVELOPED WINTER ROAD POORLY DRAINED TERRAIN	VERY SENSITIVE AREA	POOR	UNSUITABLE				LOW
6.34	1061-B2 ⁷ BD6-34 ⁹	ZONE 9 488,200E 7,402,000N	SAND, FINE SOME SILT & GRAVEL	3	TERRACED KAMES GLACIOFLUVIAL DEPOSITS	LOW TO MEDIUM	GOOD	A) 80,000 B) 2 X 10 ⁶ C) 20 X 10 ⁶	7.5	0-1.5	UNDEVELOPED WINTER ROAD, FLAT THERMOKARST TERRAIN	SILTATION CONTROLS	NONE	FAVOURABLE				MEDIUM
6.35	1026 ⁴ BD6-33 ⁹	ZONE 9 478,300E 7,399,700N	LIMESTONE	NG	BEDROCK OUTCROP		GOOD	C) UNLIMITED			UNDEVELOPED WINTER ROAD, BARGE IN SUMMER, ROLLING TO FLAT TERRAIN	HIGHLY SENSITIVE PEREGRINE FALCON NESTING AREA	NONE	FAVOURABLE				MEDIUM
6.36	1061-B7 ⁷ BD6-36 ⁹	ZONE 9 485,400E 7,395,700N	SAND, SILTY TRACE OF GRAVEL	3	KAME COMPLEX GLACIOFLUVIAL DEPOSITS	MEDIUM	GOOD	B) 750,000 C) 1.5 X 10 ⁶	7.5	NONE	UNDEVELOPED WINTER ROAD FLAT, THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	UNSUITABLE				MEDIUM
6.37	BD6-37 ⁹	ZONE 9 484,000E 7,394,500N	GRAVEL	2	GRAVEL MOUNDS (GLACIOFLUVIAL)	LOW		B) 100,000 C) 1 X 10 ⁶	9		UNDEVELOPED WINTER ROAD FLAT, THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	GOOD	30	9	A) 100 B) 80 C) 6 D) 3	HIGH
6.38	1024A ⁴ BD7-9 ⁹	ZONE 9 485,500E 7,391,000N	LIMESTONE	NG	BEDROCK OUTCROP		GOOD	C) UNLIMITED		6.0 SILT	UNDEVELOPED WINTER ROAD, BARGE IN SUMMER	VERY SENSITIVE AREA, PEREGRINE HABITAT	NONE	FAVOURABLE				MEDIUM
6.39	BD7-12 ⁹	ZONE 9 478,500E 7,386,500N	SAND	4	SAND DUNES ON GLACIOFLUVIAL TRINE PLAIN	MEDIUM TO HIGH		C) 10 X 10 ⁶	9		UNDEVELOPED BARGE SUMMER, WINTER, ROAD, POORLY DRAINED AND STEEP	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
6.40	BD7-13 ⁹	ZONE 9 476,000E 7,383,500N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSIT			B) 500,000 C) 2 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD, BARGE SUMMER, FLAT POORLY DRAINED TERRAIN	GOOD MOOSE, BEAVER & MUSKRAT HABITAT	NONE	FAVOURABLE				MEDIUM
6.41	1021 ⁴ BD7-14 ⁹	ZONE 9 491,000E 7,384,500N	GRAVEL & SAND (GM, SP-SM)	3	KAME TERRACE	LOW	GOOD	A) 90,000 B) 7.5 X 10 ⁶ C) 10 X 10 ⁶	6	1.5 SAND & SILT	UNDEVELOPED WINTER ROAD, BARGE IN SUMMER	NO MAJOR CONCERNS	POOR	GOOD	200	6	A) 480 B) 360 C) 40 D) 20	HIGH
6.42	1061-B3 ⁷ 1022 ⁴ BD7-11 ⁹	ZONE 9 496,000E 7,386,700N	GRAVEL & SAND, TRACE SILT (GM-GP, SM)	3	KAME & KAME TERRACES	LOW	GOOD	A) 400,000 B) 4 X 10 ⁶ C) 6.5 X 10 ⁶	3	0.15, PEAT & SILT	UNDEVELOPED WINTER ROAD	GOOD MOOSE HABITAT	POOR	FAVOURABLE				MEDIUM
6.43	1020 ⁴ BD7-15 ⁹	ZONE 9 492,100E 7,383,200N	GRAVEL (GM)	2	LARGE KAME	HIGH	GOOD	A) 300,000 B) 600,000 C) 600,000	3.5	3.7, CLAY, SILT FINE SAND	UNDEVELOPED WINTER ROAD, BARGE-SUMMER GENTLY SLOPING TERRAIN	GOOD MOOSE HABITAT	POOR	GOOD	50	3-5	A) 80 B) 60 C) 10 D) 5	HIGH
6.44	1019A ⁴ BD7-16 ⁹	ZONE 9 497,000E 7,381,000N	SAND & SILT (SM)	4	GLACIOFLUVIAL OUTWASH (THIN)		GOOD				UNDEVELOPED	GOOD MOOSE BEAVER & MUSKRAT HABITAT	NONE	UNSUITABLE				LOW
6.45	1015A ⁴ BD7-22 ⁹	ZONE 9 526,500E 7,381,500N	LIMESTONE	NG	BEDROCK OUTCROP		GOOD	C) UNLIMITED			UNDEVELOPED	MODERATELY SENSITIVE	NONE	FAVOURABLE				MEDIUM
6.46	BD7-19 ⁹	ZONE 9 533,500E 7,384,500N	SAND & GRAVEL	3	GLACIOFLUVIAL PLAIN			B) 500,000 C) 2 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD, GENTLY ROLLING TERRAIN	SILTATION OF BLUFISH RIVER	NONE	FAVOURABLE				MEDIUM
6.47	1013 ⁴ BD7-21 ⁹	ZONE 9 534,000E 7,381,500N	SAND & GRAVEL, TRACE SILT (GM-SM)	3	ALLUVIAL TERRACE	NONE	GOOD	A) 90,000 B) 900,000 C) 3 X 10 ⁶	3	0.3 PEAT & SILT	UNDEVELOPED WINTER ROAD, FLAT TERRAIN	HIGHLY SENSITIVE CARIBOU & MARTEN HABITATS, SILTATION OF BLUFISH RIVER.	POOR	FAVOURABLE				MEDIUM
6.48	1012 ⁴ BD7-20 ⁹	ZONE 9 543,500E 7,386,500N	SAND & GRAVEL, SOME SILT (GP-GM)	3	ESKER	LOW	GOOD	A) 25,000 B) 500,000 C) 750,000	5.5	0-2.1 SILT	UNDEVELOPED WINTER ROAD	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM

TABLE B5: BORROW MANAGEMENT AREA No.6 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION					DATA QUALITY RELIABILITY		RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS		OVERALL ASSESSMENT	NUMBER OF BORROWHOLDINGS	DEPTH OF BORROWHOLDINGS (M)	LABORATORY TESTING	PRIORITY
6.49	1011 ⁴ BD7-67 ⁹	ZONE 9 557,000E 7,374,500N	SAND & GRAVEL TRACE SILT	3	ALLUVIAL TERRACE	LOW	GOOD	A) 150,000 B) 2.5 X 10 ⁶ C) 7 X 10 ⁶	18	0.15	UNDEVELOPED WINTER ROAD MAJOR RIVER CROSSING	SILTATION OF HARE INDIAN RIVER TRAPPING AREA, PRODUCTIVE FOREST	POOR	FAVOURABLE				MEDIUM
6.50	1010A ⁴ BD7-66 ⁹	ZONE 9 549,500E 7,375,500N	LIMESTONE	NG	BEDROCK OUTCROP	LOW	GOOD	C) UNLIMITED		0-1.2 CLAY & SILT	UNDEVELOPED WINTER ROAD, MAJOR STREAM CROSSING	HIGHLY SENSITIVE WILDLIFE HABITATS SILTATION OF STREAM, PRODUCTIVE FOREST	NONE	FAVOURABLE				MEDIUM
6.51	BD7-25 ⁹	ZONE 9 540,000E 7,376,000N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSIT (RIDGED)			B) 2 X 10 ⁶ C) 8 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
6.52	1061-B10 ⁷	ZONE 9 511,500E 7,376,000N	SAND, SILTY	3	KAMES & SMALL ESKERS	LOW	GOOD	B) 750,000 C) 2.5 X 10 ⁶	3	NONE	UNDEVELOPED	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
6.53	1061-B9 ⁷ 1003 ⁴ BD7-24 ⁹	ZONE 9 504,500E 7,373,500N	GRAVEL, & SAND TRACE SILT	2	ALLUVIAL TERRACE	LOW	GOOD	A) 100,000 B) 1 X 10 ⁶ C) 3 X 10 ⁶	3	0.12 PEAT & SILT	UNDEVELOPED WINTER ROAD	MODERATELY SENSITIVE SILTATION OF LOON RIVER	POOR	GOOD	110	3-5	A) 180 B) 130 C) 22 D) 11	HIGH
6.54	1001A ⁴ BD7-31 ⁹	ZONE 9 500,000E 7,366,700N	LIMESTONE	NG	LIMESTONE CLIFFS		GOOD	C) UNLIMITED			UNDEVELOPED SUMMER BARGE ACROSS MACKENZIE RIVER STEEP TERRAIN	HIGHLY SENSITIVE GOOD MOOSE HABITAT	NONE	FAVOURABLE				MEDIUM
6.55	1002 ⁴ BD7-30 ⁹	ZONE 9 503,000E 7,370,000N	SAND, TRACE OF SILT	3	ALLUVIAL TERRACE	LOW	GOOD	A) 800,000 B) 8 X 10 ⁶ C) 10 X 10 ⁶	9	NONE	UNDEVELOPED WINTER ROAD	HIGHLY SENSITIVE GOOD MOOSE HABITAT	POOR	FAVOURABLE				MEDIUM
6.56	BD7-32 ⁹	ZONE 9 503,500E 7,368,500N	SAND, FINE TO MEDIUM	4	BDLIAN DEPOSITS			C) 2 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD	GOOD MOOSE HABITAT	NONE	FAVOURABLE				MEDIUM
6.57	BD7-29 ⁹	ZONE 9 506,000E 7,371,000N	GRAVEL	2	GRAVEL MOUNDS			B) 400,000 C) 4 X 10 ⁶	9		UNDEVELOPED WINTER ROAD	NO MAJOR CONCERNS	NONE	GOOD	120	9	A) 430 B) 320 C) 24 D) 12	HIGH
6.58	1004A ⁴ BD7-42 ⁹	ZONE 9 509,600E 7,366,800N	SAND, FINE, SOME SILT	4	SMALL KAMES	HIGH	GOOD	A) 1,500 B) 150,000 C) 750,000	3	0.15 PEAT	UNDEVELOPED WINTER ROAD	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
6.59	1005A ⁴ BD7-33 ⁹	ZONE 9 514,000E 7,368,500N	TILL	NG	LONG NARROW RIDGE						UNDEVELOPED	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
6.60	1007A ⁴ BD7-28 ⁹	ZONE 9 529,000E 7,370,000N	LIMESTONE	NG	BEDROCK OUTCROP		GOOD	C) UNLIMITED		THIN	UNDEVELOPED WINTER ROAD	LOW SENSITIVITY CARIBOU WINTERING AREA	NONE	FAVOURABLE				MEDIUM
6.61	1008A ⁴ BD7-34 ⁹	ZONE 9 535,000E 7,369,000N	SAND, SILTY, SOME GRAVEL (SM)	4	KAMES	NONE	GOOD	A) 80,000 B) 550,000 C) 850,000	4		UNDEVELOPED	HIGHLY SENSITIVE WILDLIFE HABITAT SILTATION OF BLUEFISH RIVER	POOR	UNSUITABLE				LOW
6.62	1009A ⁴ BD7-30 ⁹	ZONE 9 503,000E 7,370,000N	SILT & FINE SAND (SM)	3	ALLUVIAL TERRACE, & SAND DUNES	LOW	GOOD	A) 800,000 B) 8 X 10 ⁶ C) 10 X 10 ⁶	9		UNDEVELOPED WINTER ROAD	HIGHLY SENSITIVE FISH SPAWNING, SILTATION OF HARE INDIAN RIVER	POOR	FAVOURABLE				MEDIUM
6.63	BD7-37 ⁹	ZONE 9 540,500E 7,363,000N	SAND, FINE TO MEDIUM	4	BDLIAN SAND RIDGES			C) 1.5 X 10 ⁶	7.5		UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	PRODUCTIVE FORESTED LAND	NONE	FAVOURABLE				MEDIUM
6.64	BD7-35 ⁹	ZONE 9 536,000E 7,367,000N	SAND & GRAVEL	3	GLACIOFLUVIAL PLAIN			B) 500,000 C) 2.5 X 10 ⁶	7.5		UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	SILTATION OF HARE INDIAN RIVER PRODUCTIVE FORESTED LAND	NONE	FAVOURABLE				MEDIUM

TABLE B5: BORROW MANAGEMENT AREA No.6 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORROWHOLES	DEPTH OF BORROWHOLES (M)	LABORATORY TESTING	PRIORITY
6.65	BD7-39 ⁹	ZONE 9 529,000E 7,363,000N	SAND & GRAVEL	3	GLACIOFLUVIAL PLAIN			B) 4X 10 ⁶ C) 20 X 10 ⁶	7.5		UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	SILTATION OF HARE INDIAN RIVER PRODUCTIVE FORESTED LAND	NONE	FAVOURABLE				MEDIUM
6.66	BD7-40 ⁹	ZONE 9 526,000E 7,361,500N	SAND & GRAVEL	3	ALLUVIAL FLOOD PLAINS & TERRACES			B) 90,000 C) 350,000	2.5		UNDEVELOPED WINTER ROAD	ACTIVE STREAM CHANNEL OF HARE INDIAN RIVER	NONE	FAVOURABLE				MEDIUM
6.67	1061-B11 ⁷ FGH-6 ¹ BD7-43 ⁹ BP-195 ⁶	ZONE 9 517,800E 7,361,900N	SAND, FINE, GRAVEL POCKETS	4	ESKERS	LOW	GOOD	C) 300,000	3	0.3 ORGANIC SOIL	UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	PRODUCTIVE FORESTED LAND	NONE	UNSUITABLE				LOW
6.68	BP-196 ⁶	ZONE 9 522,500E 7,361,500N	SAND, SILTY	4		HIGH		B) 1.5 X 10 ⁶	6	0-1.5 CLAY	UNDEVELOPED WINTER ROAD	NO MAJOR CONCERNS	FAIR TO GOOD	UNSUITABLE				LOW
6.69	BP-194 ⁶	ZONE 9 523,000E 7,362,000N	SAND, FINE TO MEDIUM SILTY, CLAYEY	4		MEDIUM TO LOW		B) 650,000	7.5	0.3, PEAT	UNDEVELOPED WINTER ROAD	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
6.70	1006A ⁴ BD7-41 ⁹ FGH-5 ¹	ZONE 9 523,000E 7,363,500N	SAND, FINE, SOME SILT, GRAVEL POCKETS	4	ESKER	LOW	GOOD	C) 25,000	4		UNDEVELOPED	MODERATELY SENSITIVE LAKE-MARSH COMPLEX DENNING AREA	POOR	UNSUITABLE				LOW
6.71	BD7-38 ⁹	ZONE 9 530,000E 7,360,000N	SAND, SOME SILT	3	BOLIAN SAND ON GLACIOFLUVIAL PLAIN			B) 10 X 10 ⁶ C) 100 X 10 ⁶	7.5		UNDEVELOPED WINTER ROAD POORLY DRAINED TERRAIN	SILTATION OF HARE INDIAN RIVER, PRODUCTIVE FORESTED LAND	NONE	FAVOURABLE				MEDIUM
6.72	BD7-45 ⁹	ZONE 9 541,000E 7,355,000N	SAND & GRAVEL	3	GLACIOFLUVIAL PLAIN			B) 5 X 10 ⁶ C) 20 X 10 ⁶	7.5		UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
6.73	BD7-44 ⁹	ZONE 9 535,500E 7,358,000N	SILT, CLAY & SAND, UNSORTED, (TILL)	4	MORAINAL TILL			C) 150,000	3.5		UNDEVELOPED WINTER ROAD SLIGHTLY THERMOKARST	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
6.74	BD7-46 ⁹ BD7-47 ⁹	ZONE 9 531,000E 7,355,500N	SAND & GRAVEL	4	BOLIAN AND GLACIOFLUVIAL DEPOSITS			C) 6 X 10 ⁶	7.5		UNDEVELOPED WINTER ROAD NUMEROUS LAKES AND STREAMS	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
6.75	1061-B12 ⁷ BD7-48 ⁹ FGH1 ¹	ZONE 9 528,400E 7,355,000N	SAND, TRACE SILT	4	KAME & GLACIOFLUVIAL PLAIN	LOW	FAIR	C) 5 X 10 ⁶	3	0.3 TOPSOIL & SILT	UNDEVELOPED SEISMIC LINES ACCESS, THERMALLY SENSITIVE TERRAIN	SILTATION OF ONTARIO LAKE, PRODUCTIVE FORESTED LAND	POOR	UNSUITABLE				LOW
6.76	BD7-49 ⁹	ZONE 9 523,000E 7,354,000N	SAND, FINE TO MEDIUM GRAINED	4	BOLIAN DEPOSITS			C) 25 X 10 ⁶	7.5		UNDEVELOPED WINTER ROAD	SILTATION OF HARE INDIAN RIVER PRODUCTIVE FORESTED LAND	NONE	UNSUITABLE				LOW
6.77	BD7-50 ⁹ FGH1 ¹	ZONE 9 523,100E 7,352,100N	GRAVEL SOME SAND	2	ESKER RIDGE	LOW	GOOD	A) 1.5 X 10 ⁶ B) 2 X 10 ⁶ C) 5.5 X 10 ⁶	3	0-2.0 TOPSOIL & SILT	UNDEVELOPED WINTER ROAD POORLY DRAINED GLACIAL TERRAIN	PRODUCTIVE FORESTED LAND	FAIR	GOOD	165	12	A) 800 B) 600 C) 32 D) 16	HIGH
6.78	BD7-51 ⁹	ZONE 9 522,500E 7,348,000N	SAND	4	GLACIOFLUVIAL PLAIN			C) 200 X 10 ⁶	7.5		UNDEVELOPED WINTER ROAD	PRODUCTIVE FORESTED LAND	NONE	UNSUITABLE				LOW
6.79	BD7-54 ⁹ FGH4X ¹	ZONE 9 518,000E 7,349,800N	GRAVEL LITTLE SAND	3	GLACIOFLUVIAL OUTWASH	LOW	FAIR	A) 55,000 B) 550,000 C) 750,000	12	0-0.45 PEAT & SILT	UNDEVELOPED ADJACENT FORT GOOD HOPE AIRPORT	SILTATION OF JACKFISH CREEK, PRODUCTIVE FORESTED LAND	POOR	GOOD	150	12	A) 720 B) 540 C) 30 D) 15	HIGH
6.80	BD7-53 ⁹ FGH2 ¹	ZONE 9 519,000E 7,351,400N	GRAVEL SOME SAND	2	KAME DELTA, ESKER COMPLEX	LOW	GOOD	A) 400,000 B) 2.5 X 10 ⁶ C) 25 X 10 ⁶	12	0-0.15 ORGANIC TOPSOIL	PARTIALLY DEVELOPED EXISTING ALL WEATHER ROAD	SILTATION OF HARE INDIAN RIVER, PRODUCTIVE FORESTED LAND	POOR	EXCELLENT	135	12	A) 640 B) 480 C) 30 D) 15	HIGH

TABLE B5: BORROW MANAGEMENT AREA No.6 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORROWHOLES	DEPTH OF BORROWHOLES (M)	LABORATORY TESTING	PRIORITY
6.81	BD7-52 ⁹ FGH3 ¹	ZONE 9 518,100E 7,352,400N	GRAVEL SOME SAND	3	GLACIOFLUVIAL OUTWASH TERRACE	LOW	FAIR	A) 650,000 B) 800,000 C) 10 X 10 ⁶	10	0-0.45 ORGANIC TOPSOIL	UNDEVELOPED ACCESS BY CNT LINE & SEISMIC CUT LINES	SILTATION OF HARE INDIAN RIVER, PRODUCTIVE FORESTED LAND	POOR	GOOD	70	10	A) 280 B) 210 C) 15 D) 7	HIGH
6.82	BD7-55 ⁹ FGH8 ¹	ZONE 9 517,500E 7,348,000N	SAND & GRAVEL	3	GLACIOFLUVIAL OUTWASH PLAIN		GOOD	B) 750,000 C) 10 X 10 ⁶	12	0.3 ORGANIC TOPSOIL	UNDEVELOPED EXISTING WINTER ROAD ALONG SEISMIC LINES	SILTATION OF JACKFISH CREEK	NONE	FAVOURABLE				MEDIUM
6.83	BD7-56 ⁹	ZONE 9 515,000E 7,346,000N	SAND & GRAVEL	3	ALLUVIAL FAN DEPOSIT			B) 100,000 C) 1 X 10 ⁶	7.5		UNDEVELOPED WINTER ACCESS THERMOKARST TERRAIN	RELOCATION OF ADJACENT STREAM CHANNEL (SILTATION)	NONE	FAVOURABLE				MEDIUM
6.84	BD7-58 ⁹	ZONE 9 504,000E 7,347,000N	SAND & GRAVEL	2	GLACIOFLUVIAL DEPOSIT			B) 300,000 C) 1.5 X 10 ⁶	3.5		UNDEVELOPED CROSS MACKENZIE RIVER SUMMER BARGE, WINTER ROAD	PEREGRINE FALCON NESTING AREA	NONE	GOOD (SEE ENV.)	40	3-5	A) 64 B) 48 C) 8 D) 4	HIGH
6.85	BD7-57 ⁹	ZONE 9 502,000E 7,343,000N	SAND, COARSE GRAINED	4	COLLUVIAL COMPLEX						UNDEVELOPED	PEREGRINE FALCON NESTING AREA, GOOD MOOSE HABITAT	NONE	UNSUITABLE				LOW
6.86	BD7-59 ⁹ FGH-7 ¹	ZONE 9 525,100E 7,342,200N	SAND LITTLE SILT	4	ESKER		FAIR	C) 100,000	1	0.15 TOPSOIL	UNDEVELOPED SEISMIC LINES, WINTER ROAD, THERMOKARST	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
6.87	316 ¹ BD7-60 ⁹	ZONE 9 535,000E 7,337,200N	SAND, SOME SILT LITTLE GRAVEL (SM-GM)	4	GLACIOFLUVIAL OUTWASH		FAIR	C) 20,000	3	THIN	UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	SILTATION OF TSINTU RIVER	NONE	UNSUITABLE				LOW
6.88	317 ¹ BD7-61 ⁹	ZONE 9 536,100E 7,336,300N	SAND, SOME GRAVEL SILTY (SM-GM)	4	GLACIOFLUVIAL OUTWASH		GOOD	C) 40,000	4	THIN	UNDEVELOPED WINTER ROAD, THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
6.89	315 ¹ BD7-62 ⁹	ZONE 9 531,100E 7,326,600N	GRAVEL, SOME SAND, TRACE TO LITTLE SILT (GM-GM)	2	ESKER RIDGES	LOW	GOOD	A) 25,000 B) 500,000 C) 1 X 10 ⁶	1-4	0.75-1.4 PEAT & SILT	UNDEVELOPED WINTER ROAD, CNT POLE LINE/ SEISMIC LINE THERMOKARST	NO MAJOR CONCERNS	POOR	GOOD	50	3-5	A) 80 B) 60 C) 10 D) 5	HIGH
6.90	BA-25 ⁵	ZONE 9 528,000E 7,322,500N	SILT (TILL) CLAYEY	NG		HIGH				0-0.3 PEAT	UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
6.91	318 ¹ BD7-63 ⁹	ZONE 9 522,500E 7,333,900N	SAND, LITTLE GRAVEL SILTY (SM-GM)	4	ESKER RIDGE		FAIR	C) 25 X 10 ⁶	2.5	THIN	UNDEVELOPED THERMALLY SENSITIVE TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
6.92	314 ¹ BD7-64 ⁹	ZONE 9 520,000E 7,320,000N	SILT, SANDY & CLAYEY	NG	ALLUVIAL FLOOD PLAIN	HIGH	POOR TO FAIR				UNDEVELOPED SEISMIC LINES THERMOKARST TERRAIN	SILTATION OF SHARI CREEK	NONE	UNSUITABLE				LOW

TABLE B6: BORROW MANAGEMENT AREA No.7 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION					RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORROWHOLES	DEPTH OF BORROWHOLES (M)
7.01	315 325 345	ZONE 9 532,000E 7,315,500N	SAND & GRAVEL	4	SLOPE WASH OVER GROUND MORAINES	MEDIUM		B) 800,000	3.5	0-0.3	UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE		LOW
7.02	313X1 BD8-19	ZONE 9 533,000E 7,313,900N	SAND & SILT WITH LIMESTONE FRAGMENTS	NG	SLOPE WASH OVER GROUND MORAINES	LOW TO HIGH	GOOD			0.5-2.0, PEAT, SILT	UNDEVELOPED THERMOKARST TERRAIN	NO MAJOR CONCERNS	POOR	UNSUITABLE		LOW
7.03	3191 365 375 BD8-29	ZONE 9 533,500E 7,312,500N	LIMESTONE	NG	LIMESTONE BLUFFS & EXPOSURES	LOW	FAIR	C) UNLIMITED		1.5-2.5 COLLUVIUM	UNDEVELOPED	RAPTOR NEST SITES	POOR	FAVOURABLE		MEDIUM
7.04	3121 BD8-39	ZONE 9 537,000E 7,303,200N	SAND & SILT	NG	SLOPE WASH, REMOVED GLACIAL TILL	LOW	GOOD			0.15, PEAT & TOPSOIL	UNDEVELOPED, EXISTING WINTER TRAIL	SILTATION OF DONNELLY RIVER	POOR	UNSUITABLE		LOW
7.05	3111 BD8-59	ZONE 9 544,600E 7,300,000N	LIMESTONE	NG	LIMESTONE ESCARPMENT	LOW	GOOD	C) UNLIMITED		2.0 PEAT & SILT	UNDEVELOPED EXISTING WINTER TRAIL, THERMOKARST	NO MAJOR CONCERNS	POOR	FAVOURABLE		MEDIUM
7.06	3091 BD8-49	ZONE 9 539,000E 7,300,800N	LIMESTONE FRAGMENTS (GRAVEL)	3	ALLUVIAL CONES	MEDIUM	GOOD	A) 300,000 B) 550,000 C) 1 X 10 ⁶	9	NONE	UNDEVELOPED WINTER ROAD THERMALLY SENSITIVE TERRAIN	RAPTOR NEST SITES	POOR	FAVOURABLE		MEDIUM
7.07	BD8-69	ZONE 9 526,500E 7,295,000N	SAND	3	BOLIAN DEPOSIT			B) 400,000 C) 4 X 10 ⁶	6		UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	SILTATION OF DONNELLY RIVER	NONE	FAVOURABLE		MEDIUM
7.08	3101 BD8-79	ZONE 9 541,600E 7,295,200N	LIMESTONE & DOLOMITE FRAGMENTS	NG	TALUS SLOPES CONES, & ROCK GLACIERS	HIGH	GOOD TO FAIR			NONE	UNDEVELOPED WINTER ROAD THERMOKARST TERRAIN	RAPTOR NEST SITES	NONE	UNSUITABLE		LOW
7.09	308X1 BD8-89	ZONE 9 548,500E 7,291,000N	SILT	NG	GLACIOFLUVIAL OUTWASH DEPOSIT	HIGH	GOOD			0.45-0.75 PEAT	UNDEVELOPED EXISTING TRAIL, WINTER ROAD	RAPTOR NEST SITES	POOR	UNSUITABLE		LOW
7.10	3071 BD8-99	ZONE 9 549,500E 7,298,600N	LIMESTONE	NG	BEDROCK OUTCROP		GOOD	C) UNLIMITED		VARIABLE	UNDEVELOPED WINTER ROAD, RUGGED, THERMOKARST TERRAIN	RAPTOR NEST SITES	NONE	FAVOURABLE		MEDIUM
7.11	3051 BD8-109	ZONE 9 547,300E 7,278,200N	LIMESTONE & DOLOMITE FRAGMENTS	NG	TALUS CONES ROCK GLACIER	HIGH	GOOD	C) UNLIMITED		NONE	UNDEVELOPED CUT LINE, WINTER ROAD, THERMOKARST TERRAIN	RAPTOR NEST SITES	POOR	UNSUITABLE		LOW
7.12	575 585 595	ZONE 9 551,000E 7,288,000	SAND & GRAVEL	3		LOW		B) 500,000 C) 500,000	5	NONE	UNDEVELOPED	SILTATION OF TRIBUTARIES TO HANNA RIVER	POOR	FAVOURABLE		MEDIUM
7.13	3061 BD8-119	ZONE 9 551,200E 7,287,100N	GLACIAL TILL & SLOPE WASH	NG	SLOPE WASH OVER GLACIAL MORAINES	LOW	GOOD			0.3 PEAT & ORGANIC TOPSOIL	UNDEVELOPED EXISTING CNT POLE LINE	RAPTOR NEST SITES	POOR	UNSUITABLE		LOW
7.14	3041 60A/B5 96E-B17 BD8-129	ZONE 9 554,700E 7,284,200N	LIMESTONE & DOLOMITE FRAGMENTS & BLOCKS	3	TALUS SLOPES & ROCK GLACIERS	HIGH	GOOD	C) UNLIMITED		NONE	UNDEVELOPED WINTER ROAD, THERMOKARST AND HANNA RIVER CROSSING	RAPTOR NEST SITES	POOR	UNSUITABLE		LOW
7.15	3031 61/62A5 96E-B17 BD8-139	ZONE 9 555,000E 7,283,400N	SAND & GRAVEL SILTY (SM-GM)	3	KAME TERRACE	LOW	GOOD	A) 250,000 B) 2.5 X 10 ⁶ C) 5.5 X 10 ⁶	6	0.6-3.6 TOPSOIL & SILT	UNDEVELOPED CNT POLE LINE, WINTER ROAD, THERMOKARST TERRAIN	SILTATION OF HANNA RIVER	POOR	FAVOURABLE		MEDIUM
7.16	3021 BD8-149	ZONE 9 557,500E 7,282,200N	SAND & GRAVEL	3	KAME TERRACE	LOW	GOOD	A) 1.5 X 10 ⁶ B) 9 X 10 ⁶ C) 13 X 10 ⁶	4.5	0.6-2.1 TOPSOIL & SILT	UNDEVELOPED CNT POLE LINE, WINTER ROAD, HANNA RIVER CROSSING	SILTATION OF HANNA RIVER	FAIR	FAVOURABLE		MEDIUM

TABLE B6: BORROW MANAGEMENT AREA No.7 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORHOLES	DEPTH OF BORHOLES (M)	LABORATORY TESTING	PRIORITY
7.17	BD8-15 ⁹	ZONE 9 530,000E 7,280,000N	SAND & GRAVEL	3	GLACIOFLUVIAL DEPOSIT			B) 5 X 10 ⁶ C) 25 X 10 ⁶	15		UNDEVELOPED MAJOR RIVER CROSSING, THERMOKARST TERRAIN	NO MAJOR CONCERNS, PRODUCTIVE FORESTED LAND	NONE	FAVOURABLE				MEDIUM
7.18	301 ¹ 68 ⁵ 70A/B ⁵ BD8-16 ⁹	ZONE 9 558,400E 7,277,200N	LIMESTONE & DOLOMITE	NG	BEDROCK RIDGES & TALUS SLOPES		GOOD	C) UNLIMITED		THIN	UNDEVELOPED, WINTER ROAD, THERMALLY SENSITIVE TERRAIN	RAPTOR NEST SITES	NONE	FAVOURABLE				MEDIUM
7.19	BD8-35 ⁹	ZONE 9 559,500E 7,275,000N	SAND & SILT (TILL)	4	SANDY TILL PLAIN		FAIR	C) 15 X 10 ⁶	3	0-0.3 TOPSOIL & TILL	UNDEVELOPED WINTER ROAD, SLIGHTLY THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
7.20	300 ¹ BD8-17 ⁹	ZONE 9 557,500E 7,271,200N	SAND, FINE (SP)	4	EDLIAN DUNES		GOOD	C) 4 X 10 ⁶	12	THIN	UNDEVELOPED THERMOKARST TERRAIN, WINTER ROAD	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
7.21	299A ¹ BD8-18 ⁹	ZONE 9 560,700E 7,270,700N	SAND, TRACE SILT (SP)	4	EDLIAN DUNES		GOOD	C) 700,000	7.5	THIN TOPSOIL	UNDEVELOPED CNT POLE LINE, THERMOKARST TERRAIN	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
7.22	74 ⁵ 75 ⁵	ZONE 9 561,500E 7,273,000N	SAND & GRAVEL	3		LOW		A) 50,000 B) 150,000 C) 150,000	3	0.3	UNDEVELOPED	NO MAJOR CONCERNS	POOR	FAVOURABLE				MEDIUM
7.23	298 ¹ BD8-19 ⁹	ZONE 9 563,000E 7,271,400N	LIMESTONE & SHALE	NG	BEDROCK RIDGES		GOOD	C) UNLIMITED		VARIABLE DRIFT & SCREE	UNDEVELOPED CNT POLE LINE, WINTER ROAD, THERMOKARST TERRAIN	RAPTOR NEST SITES	NONE	FAVOURABLE				MEDIUM
7.24	BD8-36 ⁹	ZONE 9 564,500E 7,269,000N	SAND & GRAVEL	3	GLACIALFLUVIAL OUTWASH PLAIN		FAIR	B) 10 X 10 ⁶ C) 40 X 10 ⁶	7.5	0-0.3 TOPSOIL & SILT	UNDEVELOPED WINTER ROAD FLAT TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
7.25	296 ¹ 77 ⁵ 79/80 ⁵ BD8-21 ⁹	ZONE 9 565,900E 7,267,600N	GRAVEL (GW)	2	GLACIOFLUVIAL DELTA	LOW	GOOD	A) 2.5 X 10 ⁶ B) 10 X 10 ⁶ C) 15 X 10 ⁶	5.5	0.30 TOPSOIL	UNDEVELOPED CNT POLE LINE, WINTER ROAD, THERMOKARST TERRAIN	SILTATION OF ELLIOT CREEK	POOR	GOOD	150	5-10	A) 450 B) 340 C) 30 D) 15	HIGH
7.26	297 ¹ BD8-20 ⁹	ZONE 9 566,200E 7,268,500N	LIMESTONE & DOLOMITE FRAGMENTS TO BLOCKS	NG	TALUS SLOPES ROCK GLACIERS	HIGH	GOOD		20	NONE	UNDEVELOPED WINTER ROAD, THERMOKARST TERRAIN	SILTATION OF ELLIOT CREEK, RAPTOR NEST SITES	NONE	UNSUITABLE				LOW
7.27	295 ¹ BD8-23 ⁹	ZONE 9 567,000E 7,266,200N	LIMESTONE	NG	BEDROCK RIDGE		FAIR	C) UNLIMITED			UNDEVELOPED WINTER ROAD WET THERMOKARST TERRAIN	RAPTOR NEST SITES	NONE	FAVOURABLE				MEDIUM
7.28	299 ¹ BD8-22 ⁹	ZONE 9 564,300E 7,265,400N	SAND (SP)	4	EDLIAN DUNES (ERODED)	LOW	GOOD	A) 10,000 B) 1 X 10 ⁶ C) 1.5 X 10 ⁶	7.5	0.3 TOPSOIL	UNDEVELOPED ACCESS ALONG CNT LINE OR MACKENZIE RIVER	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
7.29	82 ⁵	ZONE 9 560,000E 7,270,500N	SAND	4		LOW		B) 500,000	6	NONE	UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
7.30	294 ¹ BD8-24 ⁹	ZONE 9 568,800E 7,264,300N	LIMESTONE & DOLOMITE BLOCKS	NG	TALUS ROCK SLIDE		GOOD	C) UNLIMITED		NONE	UNDEVELOPED POORLY DRAINED, THERMALLY SENSITIVE TERRAIN	RAPTOR NEST SITES	NONE	UNSUITABLE				LOW
7.31	293 ¹ BD8-25 ⁹	ZONE 9 572,400E 7,260,000N	LIMESTONE & DOLOMITE FRAGMENTS	NG	TALUS SLOPES & CONES		GOOD	A) 100,000 B) 1 X 10 ⁶ C) 13 X 10 ⁶	18	NONE	UNDEVELOPED ACCESS ON CNT LINE THERMOKARST TERRAIN	RAPTOR NEST SITES	POOR	FAVOURABLE				MEDIUM
7.32	84 ⁵	ZONE 9 567,500E 7,261,000N	SAND	4				B) 280,000	5	NONE	UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW

TABLE B6: BORROW MANAGEMENT AREA No.7 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BOREHOLES	DEPTH OF BOREHOLES (M)	LABORATORY TESTING	PRIORITY
7.33	2921 ¹ 86,87,88 ⁵ BP-156 ⁶ BD8-26 ⁹	ZONE 9 570,000E 7,260,000N	SAND (SP)	4	ERIAN DUNES	LOW	GOOD	A) 3 X 10 ⁶ B) 5 X 10 ⁶ C) 15 X 10 ⁶	9	0-0.3 TOPSOIL	UNDEVELOPED ACCESS ALONG CNT POLE LINE/ MACKENZIE RIVER	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
7.34	2901 ¹ BD8-28 ⁹	ZONE 9 575,500E 7,261,300N	LIMESTONE & DOLOMITE FRAGMENTS, SILT & SAND	NG	TALUS SLOPE		GOOD	C) UNLIMITED		NONE	UNDEVELOPED WINTER ROAD ACROSS NORMAN RANGE	SILTATION OF OSCAR CREEK	NONE	FAVOURABLE				MEDIUM
7.35	2881 ¹ BD8-27 ⁹	ZONE 9 575,300E 7,260,800N	GRAVEL & SAND (GW-SW)	2	GLACIOFLUVIAL DELTA	LOW	GOOD	A) 1.5 X 10 ⁶ B) 7 X 10 ⁶ C) 15 X 10 ⁶	9	0.3 ORGANIC TOPSOIL	UNDEVELOPED WINTER ROAD, THERMOKARST CREEK CROSSING	SILTATION OF OSCAR CREEK, RAPTOR NEST SITES	POOR	GOOD	100	9	A) 350 B) 250 C) 20 D) 10	HIGH
7.36	2891 ¹ BD8-29 ⁹	ZONE 9 576,600E 7,529,300N	GRAVEL & SAND (GW-GW)	2	GLACIOFLUVIAL DELTA REMNANT	LOW	GOOD	A) 600,000 B) 2 X 10 ⁶ C) 3.5 X 10 ⁶	7	0.3, TOPSOIL	UNDEVELOPED EXISTING WINTER ROAD ACROSS NORMAN RANGE	SILTATION OF OSCAR CREEK	POOR	GOOD	35	7	A) 100 B) 70 C) 7 D) 3	HIGH
7.37	2911 ¹ 91A/B ⁵ BP-155 ⁶ BD8-30 ⁹	ZONE 9 575,000E 7,257,700N	SAND & GRAVEL (SW-GW)	3	TERRACES			B) 500,000 C) 2.5 X 10 ⁶	3		UNDEVELOPED EXISTING WINTER ROAD	SILTATION OF OSCAR CREEK GOOD MOOSE HABITAT PRODUCTIVE FORESTED LAND	NONE	FAVOURABLE				MEDIUM
7.38	BD8-32 ⁹	ZONE 9 567,000E 7,255,000N	LIMESTONE	NG	BEDROCK RIDGE			C) UNLIMITED			UNDEVELOPED MACKENZIE RIVER CROSSING, BARGE - SUMMER, WINTER ROAD	PRODUCTIVE FORESTED LAND	NONE	FAVOURABLE				MEDIUM
7.39	92 ⁵ 93 ⁵	ZONE 9 575,500E 7,256,000N	SAND	4		LOW		B) 100,000	3-5.5	0.15	UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
7.40	2871 ¹ 94 ⁵ 95 ⁵ BD8-31 ⁹	ZONE 9 577,800E 7,251,900N	SAND	4	ERIAN DUNES	LOW	GOOD	A) 450,000 B) 850,000 C) 1.5 X 10 ⁶	12	0.3 ORGANIC TOPSOIL	UNDEVELOPED CNT LINE ACCESS THERMOKARST TERRAIN	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
7.41	96 ⁵ 97 ⁵ 98A ⁵	ZONE 9 580,000E 7,254,000N	SAND	4		HIGH		B) 500,000	6	0.3	UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
7.42	2861 ¹ BD8-33 ⁹	ZONE 9 583,000E 7,254,200N	LIMESTONE	NG	BEDROCK RIDGES		GOOD	C) UNLIMITED			UNDEVELOPED RUGGED THERMALLY SENSITIVE TERRAIN	NO MAJOR CONCERNS	NONE	FAVOURABLE				MEDIUM
7.43	100 ⁵ 101 ⁵ 102A/B ⁵ 103 ⁵	ZONE 9 584,500E 7,249,900N	SAND	4		HIGH		B) 50,000	3.5		UNDEVELOPED	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
7.44	BD8-34 ⁹	ZONE 9 564,000E 7,240,000N	SAND & SILT	4	FLUVIAL FLOOD PLAIN			C) 50 X 10 ⁶	4.5		UNDEVELOPED WINTER ROAD, THERMOKARST SUMMER BARGE	SILTATION OF CARCAJOU RIVER	NONE	UNSUITABLE				LOW
7.45	2851 ¹ BD9-3 ⁹	ZONE 9 587,600E 7,251,900N	SAND, SOME SILT, LITTLE GRAVEL (SW-SW)	4	KAME HILLOCKS	MEDIUM TO HIGH	FAIR	B) 450,000	3		UNDEVELOPED RUGGED, THERMALLY SENSITIVE TERRAIN	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW
7.46	NW191 ¹ 107 ⁵ BD9-4 ⁹	ZONE 9 590,500E 7,250,000N	SAND & GRAVEL, TRACE SILT (SW-GW)	3	KAME-ESKER COMPLEXES		FAIR	A) 50,000 B) 350,000 C) 700,000	9	0.6 SILT	UNDEVELOPED WINTER ROAD SENSITIVE TERRAIN	NO MAJOR CONCERNS	POOR	GOOD	25	5-10	A) 75 B) 55 C) 5 D) 3	HIGH
7.47	NW16X1 ¹ 110(B) ⁵ BD9-5 ⁹	ZONE 9 593,000E 7,249,200N	LIMESTONE & SILTSTONE	NG	BEDROCK ESCARPMENT		FAIR	C) UNLIMITED		0.45-2.7 SILT & CLAY	UNDEVELOPED EXISTING CUTLINES SLOPING TERRAIN	NO MAJOR CONCERNS PRODUCTIVE FORESTED LAND	POOR	UNSUITABLE				LOW
7.48	NW111 ¹ BD9-16 ⁹	ZONE 9 588,500E 7,237,900N	SAND LITTLE SILT (SP)	4	ERIAN DUNES		GOOD	B) 2.5 X 10 ⁶	9	0.5 TOPSOIL	UNDEVELOPED MACKENZIE RIVER CROSSING, ICE ROAD OR BARGE	NO MAJOR CONCERNS	NONE	UNSUITABLE				LOW

TABLE B6: BORROW MANAGEMENT AREA No.7 - SUMMARY OF POTENTIAL BORROW SOURCE DATA

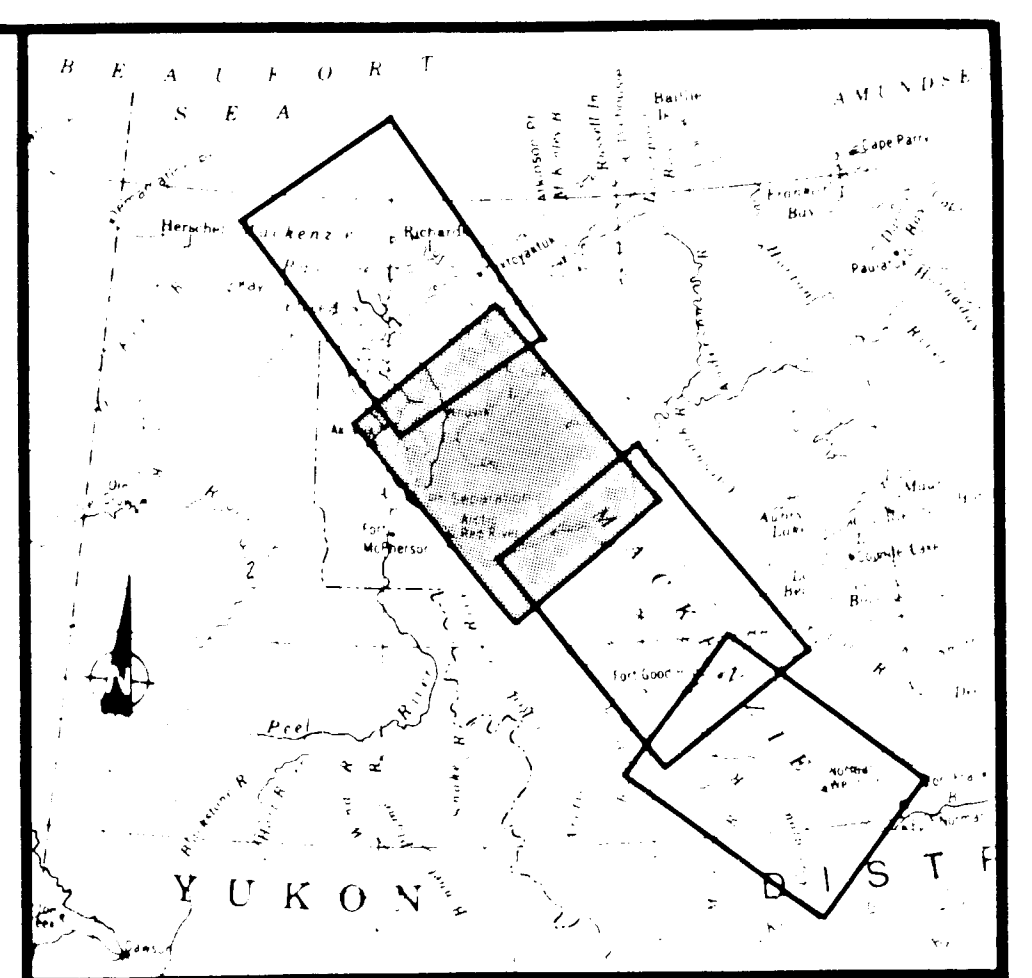
SITE IDENTIFICATION			DEPOSIT DESCRIPTION					BORROW PIT DEVELOPMENT INFORMATION							RECOMMENDATIONS FOR ADDITIONAL WORK			
BORROW SOURCE NUMBER	CROSS REFERENCE	LOCATION (UTM)	MATERIAL TYPE	MATERIAL CLASS	LANDFORM	ICE CONTENT	SURFACE DRAINAGE	ESTIMATED VOLUME (M ³)	ESTIMATED RECOVERY DEPTH (M)	OVERBURDEN THICKNESS (M)	ACCESS	ENVIRONMENTAL CONSIDERATIONS	DATA QUALITY RELIABILITY	OVERALL ASSESSMENT	NUMBER OF BORHHOLES	DEPTH OF BORHHOLES (M)	LABORATORY TESTING	PRIORITY
7.49	NW151 BD9-69	ZONE 9 598,500E 7,246,400N	GRAVEL SOME SAND & SILT (GM-GM)	3	GLACIOFLUVIAL RIDGES & KNOLLS	LOW TO MEDIUM	FAIR	A) 85,000 B) 850,000 C) 2.5 X 10 ⁶	3	0-2.4 PEAT & SILT	UNDEVELOPED MAJOR STREAM CROSSING; WINTER ROAD	HIGH SENSITIVITY ADJACENT TO COMMUNITY WATER SUPPLY	POOR	FAVOURABLE (SEE ENV)				MEDIUM
7.50	NW3X1 BD9-89	ZONE 9 598,100E 7,245,200N	GRAVEL SOME SAND (GM-GM)	2	ALLUVIAL BAR IN ACTIVE STREAM	NONE		B) 125,00 C) 500,000	1.5	NONE	UNDEVELOPED WINTER ROAD	HIGH SENSITIVITY LOCAL WATER SUPPLY	NONE	FAVOURABLE				MEDIUM
7.51	NW51 NW71 BD9-239	ZONE 9 592,000E 7,234,200N	SAND LITTLE SILT (SP)	4	EOLIAN DUNE	NONE	GOOD	A) 30,000 B) 60,000 C) 2.5 X 10 ⁶	15	2.4	UNDEVELOPED EXISTING WINTER ROAD SUMMER BARGE	NO MAJOR CONCERNS	POOR	UNSUITABLE				LOW
7.52	NW2X1 BD9-129	ZONE 9 599,000E 7,242,700N	SAND WITH GRAVEL SOME SILT (GM)	3	ALLUVIAL BARS	NONE	GOOD	B) 75,000 C) 250,000	1.5	NONE	UNDEVELOPED EXISTING WINTER ROADS FROM NORMAN WELLS	ACTIVE FLOOD PLAIN, LOCAL WATER SUPPLY, ADJACENT OIL WELLS	NONE	FAVOURABLE				MEDIUM



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CONSULTING ENGINEERING & PROFESSIONAL SERVICES

APPENDIX "C"

MAP SHEETS (C1 TO C4, 1:250,000 SCALE)



INDEX MAP

LEGEND

BORROW SOURCE DESIGNATION

- Deposit Outline
- Material Classification
- Deposit Number
- Borrow Management Area

EXPLANATION OF MATERIAL CLASSIFICATION

- (1) CLASS 1 - Excellent granular material, well graded, requiring a minimum of processing, suitable for concrete.
- (2) CLASS 2 - Good quality, well graded, granular material, with some fines, suitable for good quality fill and construction material. Requires processing for concrete.
- (3) CLASS 3 - Fair quality granular material, poorly graded with a variable portion of fines. Suitable only for general fill.
- (4) CLASS 4 - Poor quality material, predominantly fine grained with little granular material. Unsuitable for construction purposes.
- (NG) NON-GRANULAR - a) Silt and clay material, unsuitable for construction purposes.
b) Bedrock, ranging from fair to good quality. Only available if blasted and quarried.

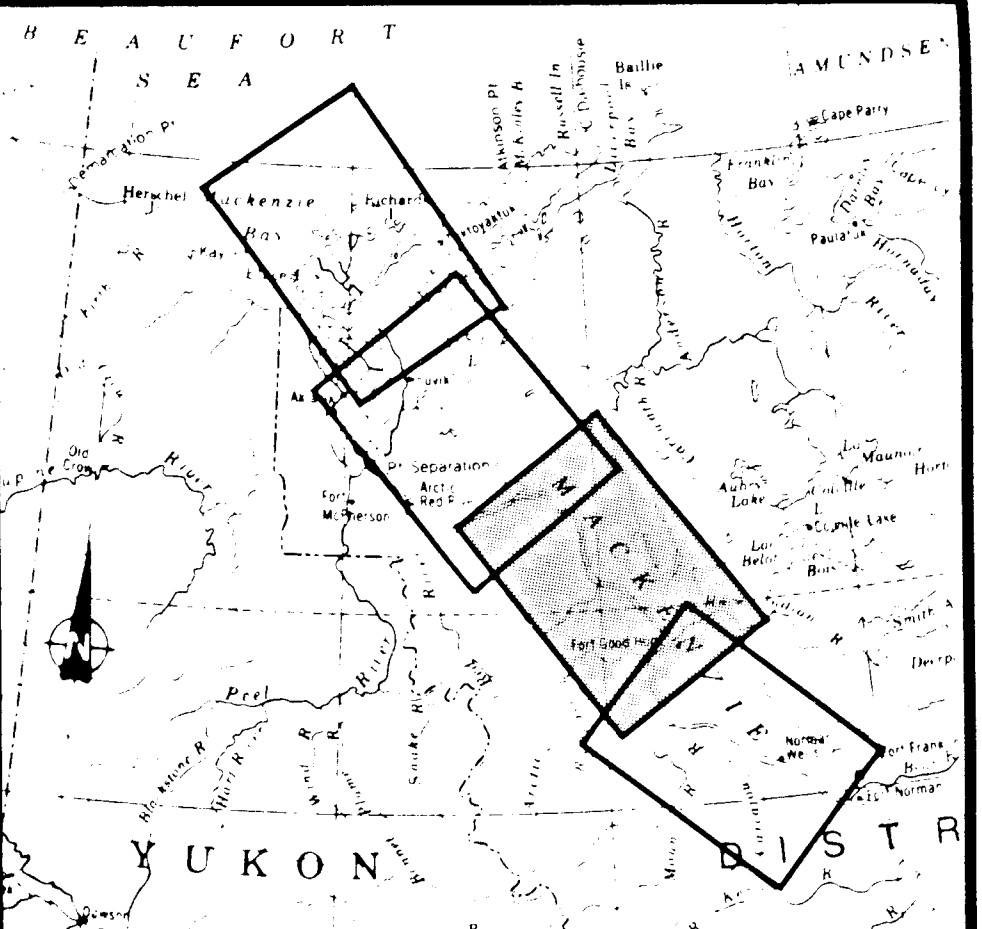
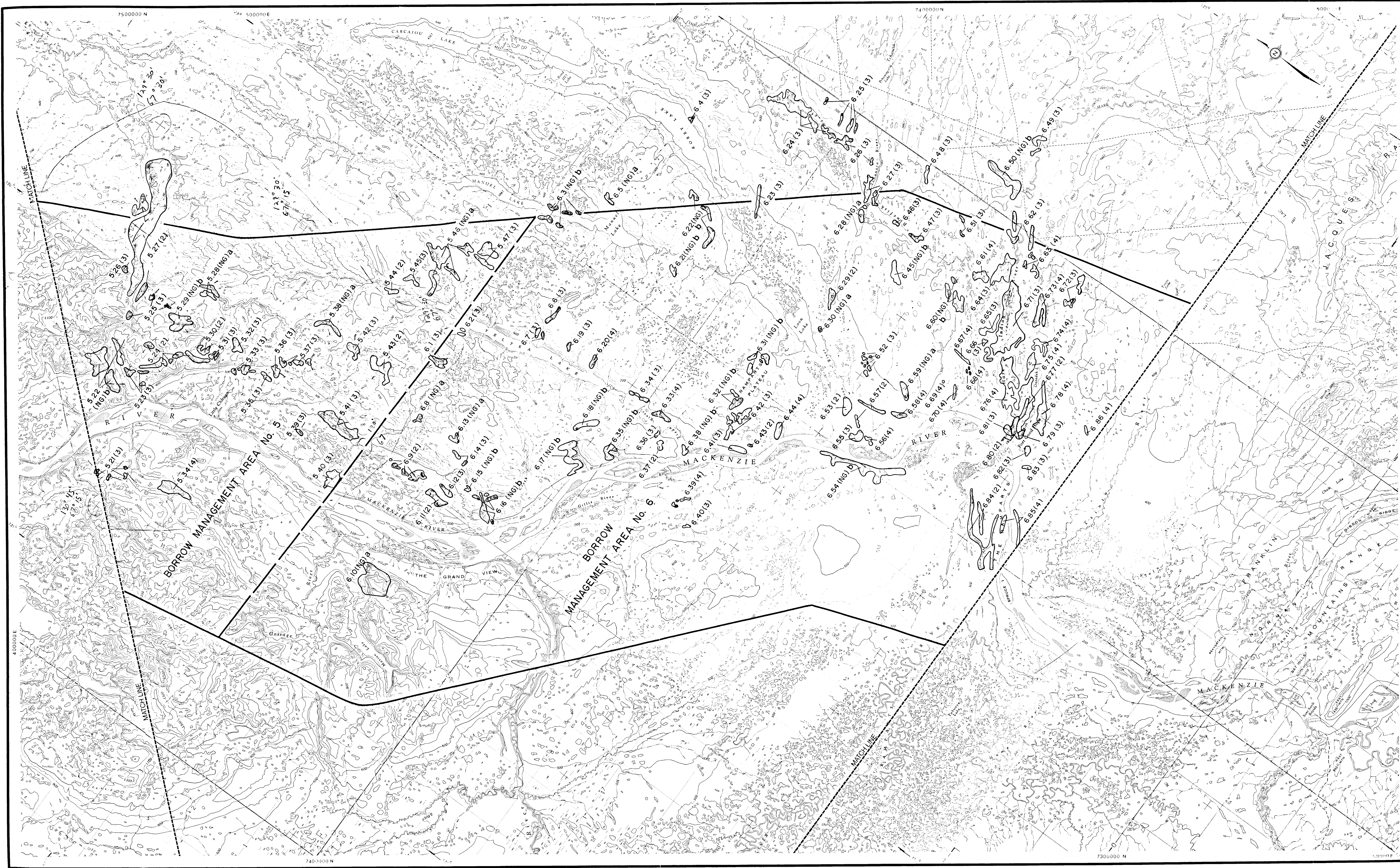
Granular Resource Potential Study Area
Borrow Management Area Boundary
Invaluable Land Selection Boundary

Indian and Northern Affairs Canada

**GRANULAR RESOURCE POTENTIAL
LOWER MACKENZIE VALLEY**

Drawn: YK/BV	Check: NM/AH	Date: Mar/86	Proj: CG10214
Scale: 1:250,000	Appr:	Sheet: 02	

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SCALE 1:50,000 or 1 inch equals 100 miles
INDEX MAP

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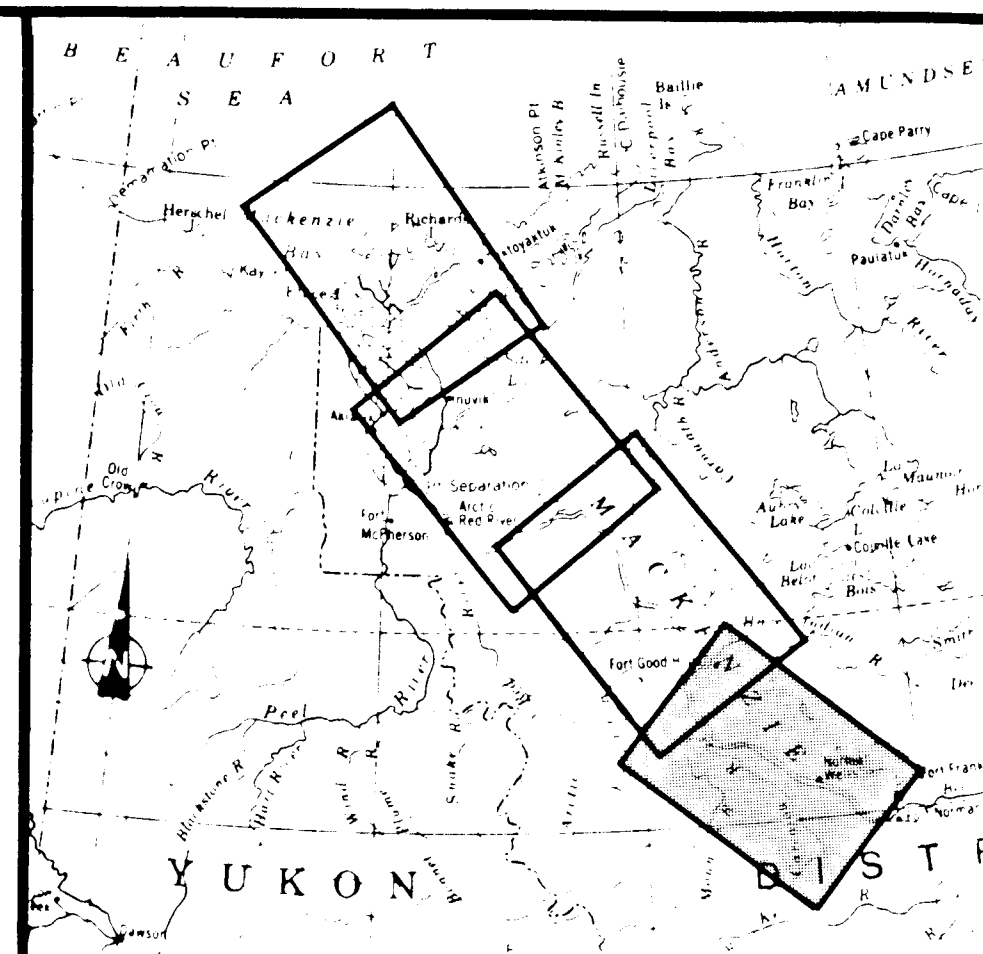
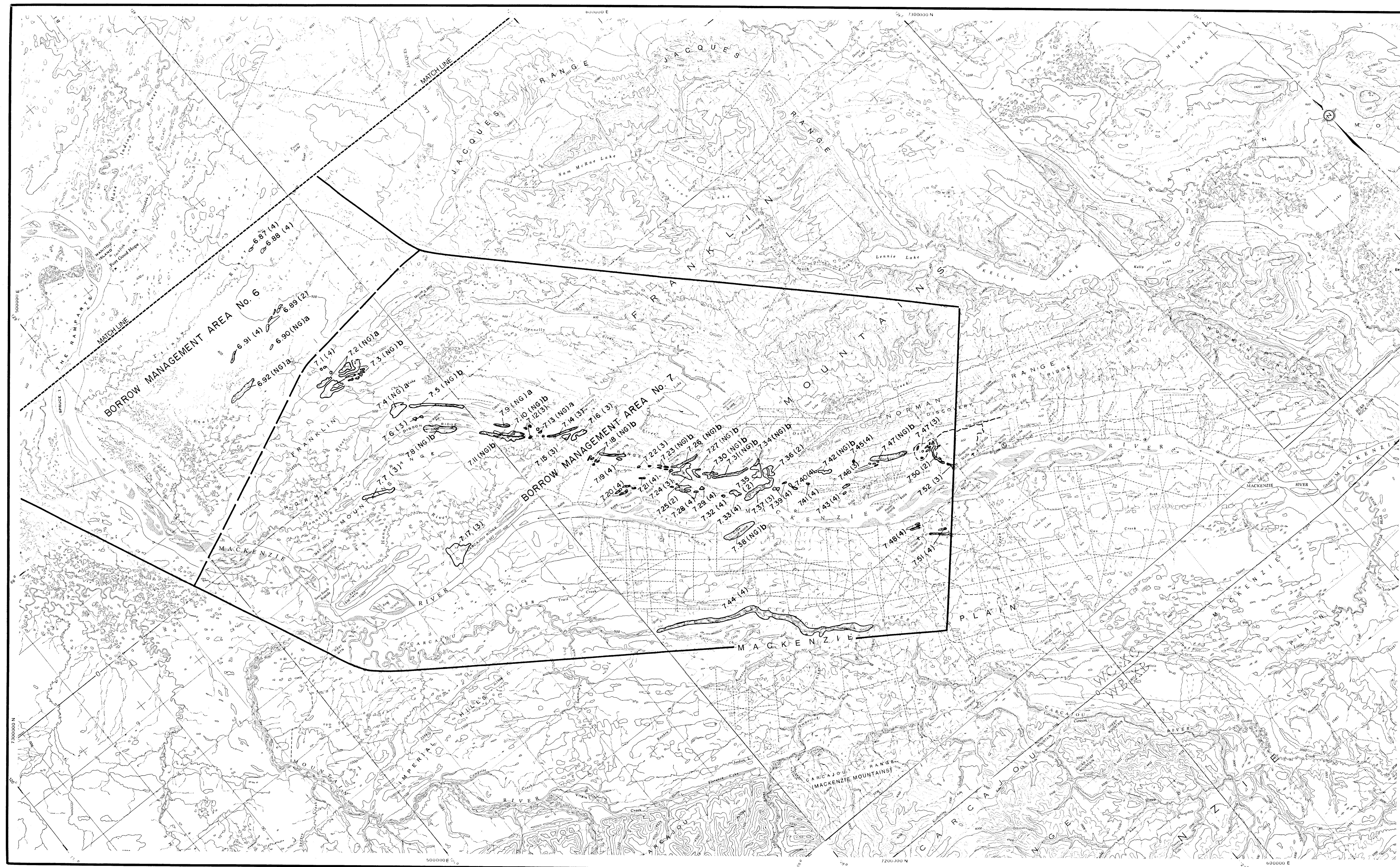
Granular Resource Potential Study Area
Borrow Management Area Boundary
Inuvialuit Land Selection Boundary

Indian and Northern Affairs Canada

**GRANULAR RESOURCE POTENTIAL
LOWER MACKENZIE VALLEY**

Drawn: YK/BV Check: NM/AH Date: Mar/86 Proj: CG102/84
Scale: 1:50,000 Appr: Sheet: C-1

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SCALE 1:500,000 or 1 inch equals 100 miles
INDEX MAP

LEGEND

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Borrow Management Area Boundary
Inuvialuit Land Selection Boundary

Indian and Northern Affairs Canada

**GRANULAR RESOURCE POTENTIAL
LOWER MACKENZIE VALLEY**

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