REGIONAL DISTRIBUTION AND CHEMISTRY OF KIMBERLITE INDICATOR MINERALS, RANKIN INLET AND MACQUOID LAKE AREAS, KIVALLIQ REGION, NUNAVUT

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I. McMARTIN, P.J. HENDERSON, B.A. KJARSGAARD AND K. VENANCE

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DIGITAL DATA

Report text and figures are available in Adobe Acrobat Reader. Appendices A to E presented in this report are included as digital data files in Microsoft Excel 2000 or in Microsoft® Word 2000. All digital files are available on CD-ROM from the GSC Bookstore, 601 Booth Street, Ottawa, Ontario, K1A 0E8, (613) 995-4342, http://www.nrcan.gc.ca/gsc/bookstore/index_e.html.

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INTRODUCTION

The western Churchill Province of the Canadian Shield in south-central Nunavut (Kivalliq Region) is a region with high potential for gold, diamond and base metal deposits. In addition to the recent discovery of the Meadowbank gold deposits north of Baker Lake (Armitage et al., 1996; Kerswill et al., 1998; Sherlock et al., 2001) and of several major gold occurrences along the Meliadine Trend, 25 km north of Rankin Inlet (Armitage et al., 1993; Miller et al., 1995; Carpenter and Duke, 1999), active mineral exploration for diamond hosting kimberlite rocks is ongoing in the region. A diamondiferous lamprophyre dyke was discovered in the Gibson Lake area in 1993 (MacRae et al., 1995, 1996). Kimberlite dykes were encountered in drill holes in 1996 on the Meliadine East gold property (Miller et al., 1998; Seller, 1999), and kimberlite outcrops and glacial erratics have been reported north of Rankin Inlet (S. Surmacz and M. Hauseux, pers. com., 1998). More recently, Shear Minerals Ltd. and Northern Empire Minerals Ltd. acquired the diamond mineral rights for the TrustMe Property in the Rankin Inlet area (Corporate news release, June 18, 2002). The basis for this diamond acquisition was the presence of diamond indicator minerals in 21 of 64 regional till samples collected in 2001.

As part of the Western Churchill National Mapping Program (NATMAP), surficial geological mapping and drift prospecting studies were completed by the Geological Survey of Canada in 1997-2002 to assist mineral exploration in areas covered by a thick blanket of glacial sediments. Two project areas were studied in detail: the Rankin Inlet area underlain by the Rankin Inlet greenstone belt which includes the Meliadine Trend, and the MacQuoid Lake area which lies within the western extent of the MacQuoid-Gibson greenstone belt. The objectives of these projects were to 1) provide a Quaternary geological framework for drift prospecting, 2) develop drift prospecting methods and strategies appropriate to each area, 3) supply a surficial material database, regarding mainly till geochemical, mineralogical and lithological composition, and 4) produce surficial geology maps. Results of till and esker composition analysis in both areas have been reported in two GSC open file publications (Henderson, 2000; McMartin, 2000). These reports also provide an overview of the surficial geology as it applies to drift prospecting in each area, mainly for gold and base metal deposits. The present open file presents data collected by the Geological Survey of Canada in the Rankin Inlet and MacQuoid Lake areas regarding indicator mineral and till geochemical dispersal potentially associated with kimberlites.

LOCATION AND PHYSIOGRAPHY

The Rankin Inlet study area (55J/13, J/14, K/16, N/1 and N/2) is located along the northwestern side of Hudson Bay, approximately 480 km north of Churchill, Manitoba, and includes the town of Rankin Inlet (Fig. 1). The area covers approximately 2,800 km^2 and is bounded by latitudes 62˚45' and 63˚15' N and longitudes 91˚ and 93˚ W. Rankin Inlet is the site of the only mine brought into production in the entire region to date, the North Rankin Nickel Mines Limited, which was closed in 1962 due to the lack of ore. The MacQuoid Lake study area (55M/7 and M/10) is located about 170 km inland (west) from the town of Chesterfield Inlet and is bounded by latitudes 63˚15' and 63˚45' N and longitudes 94˚30' and 95˚ W (Fig. 1).

The physiography of both areas is characterized by a low relief, broad, low hills, and numerous northwest to southeast oriented lakes, parallel to the last dominant regional ice flow to the southeast (McMartin and Henderson, 1999). The landscape is heavily drift covered in places, forming till plains which are locally streamlined, areas of hummocky till, and ribbed moraine (Fig. 2). Esker systems cut across the region, and raised marine beaches and nearshore sediments are found throughout both areas. The region is underlain by continuous permafrost with the depth of

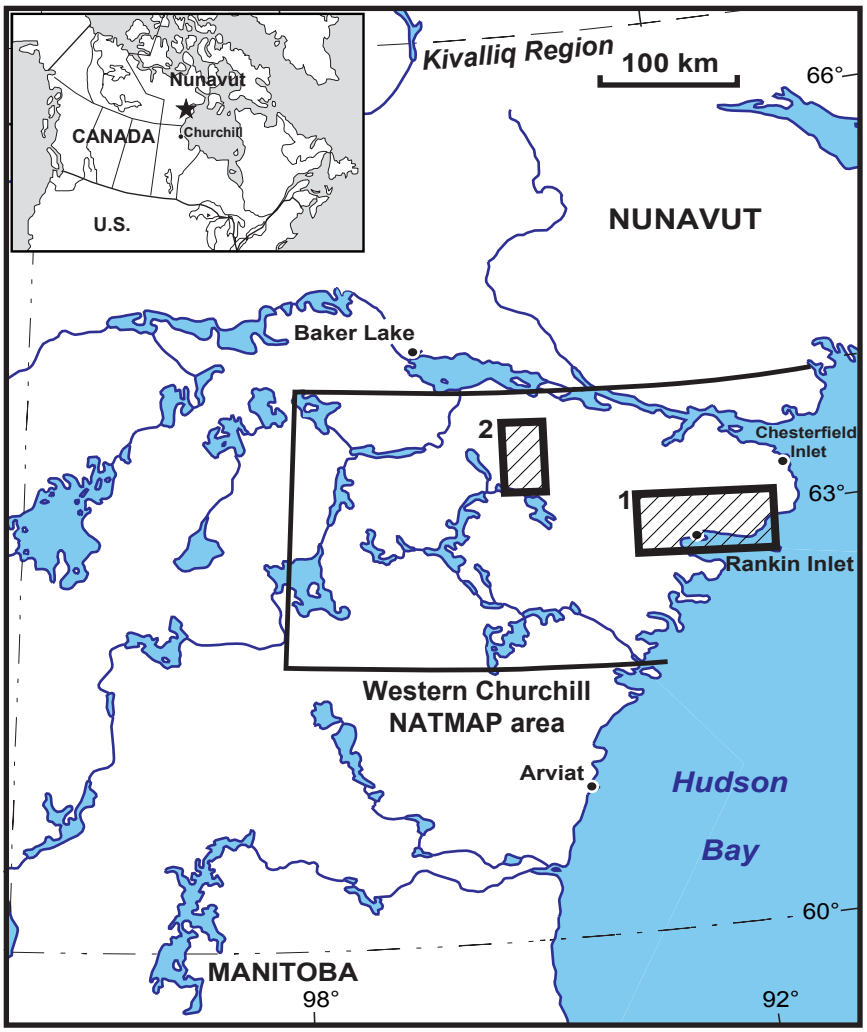

Figure 1. Location map of the two study areas in the Kivalliq Region of Nunavut: 1) Rankin Inlet, and 2) MacQuoid Lake. The Western Churchill NATMAP Project area is also outlined.

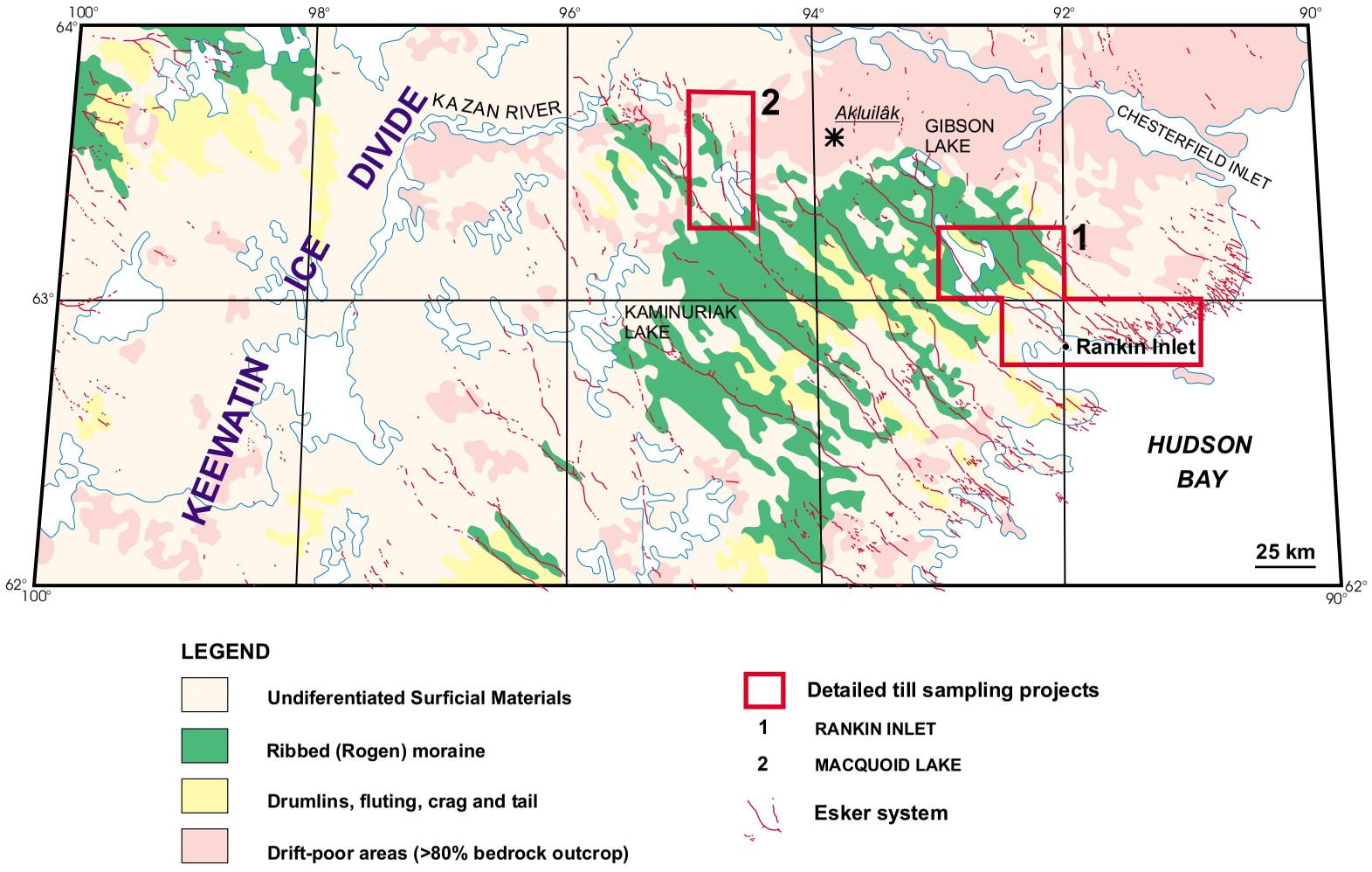

Figure 2. Location of Rankin Inlet (1) and MacQuoid Lake (2) study areas over simplified surficial geology from Aylsworth and Shilts (1989). The location of the Akluilâk diamondiferous lamprophyre dyke discussed in the text is shown by the star west of Gibson Lake.

the active layer varying from 15 to 200 cm, depending on sediment type and local drainage conditions. The vegetation is characteristic of the open tundra, and includes the presence of dwarf trees, shrubs, sedges and grasses. The area experiences a continental arctic to sub-arctic climate, with mean monthly temperatures ranging from -30˚ to + 15˚C.

REGIONAL SETTING

Bedrock geology

The Kivalliq Region includes the central part of the western Churchill Province of the Canadian Shield, which represents part of a Proterozoic reworked Archean craton lying between the Archean Slave and Superior cratons (Tella et al., 1997a). Remnants of middle and late Paleoproterozoic clastic sediments lie unconformably on the Archean gneiss terranes, supracrustal belts and associated plutons. The Rankin Inlet and the MacQuoid-Gibson greenstone belts form two of these supracrustal belts within the Archean craton.

Rankin Inlet study area

The Archean (ca. 2.66 Ga.) Rankin Inlet greenstone belt (Tella, 1994, 1995) covers about 65% of the Rankin Inlet study area (Fig. 3). It includes essentially the Rankin Inlet Group (Tella et al., 1986), a metavolcanic-metasedimentary sequence deformed and metamorphosed to greenschist grade. The Rankin Inlet Group is composed of sheared and carbonatized massive and pillowed mafic volcanic flows (1), felsic volcanics (2), interflow sediments (3), which are composed of mainly greywacke and quartz-magnetite iron formation, and minor mafic and felsic tuffs, pyroclastics, volcanic breccia and gabbro sills (Tella et al., 1997a). The higher metamorphic grade equivalents of the greenstone belt rocks are exposed north of the Rankin Inlet Group and comprise gneiss and minor remnants of banded iron formation (4). Archean and/or Paleoproterozoic layered gneiss and migmatite border the rest of the greenstone belt (5). Several compositionally distinct Archean and/or Early Proterozoic granitoid plutons are found throughout the area (6,7,9). Proterozoic sediments correlative with the Hurwitz Group discontinuously overly the sequence (8).

The kimberlite dykes recently identified in drill core along the Meliadine Trend are hosted in the Archean supracrustal rocks of the Rankin Inlet Group (cf. Fig. 3 for approximate location). The dykes display characteristics of evolved carbonate-rich kimberlites, as they are characterized by high amounts of carbonate, scarcity of mantle-derived xenocrysts and megacrysts, and general lack of Cr-bearing spinels (Seller, 1999). Several features suggest that the dykes represent lower hypabyssal facies kimberlite.

A hand sample (S-1990) examined by the Geological Survey of Canada from a suspected kimberlite outcropping north of Rankin Inlet in NTS 55O/4 (S. Surmacz and M. Hauseux, pers. com.) is interpreted as an hypabyssal facies aphanitic kimberlite (cf. Fig. 3 for approximate location). Olivine, completely altered to serpentine, is a common constituent, and the only apparent phenocryst in the sample (Fig. 4a). East of Rankin Inlet, hand samples from suspected kimberlite boulders (98-J-14) collected in a boulder train northwest of Rabbit Island in NTS 55J/14 (S. Surmacz and M. Hauseux, pers. com.) were also examined at the Geological Survey of Canada and interpreted as hypabyssal facies kimberlite (see Fig. 3 for location). Olivine and phlogopite are the main phenocrysts for these samples (Fig. 4b). The complete descriptions of these two kimberlite samples are given in Appendix A.1. The results of microprobe analysis on spinels, olivines and ilmenites picked from these samples, as well as whole rock major and trace element geochemistry, are discussed in the following sections of this report for comparison with the till samples.

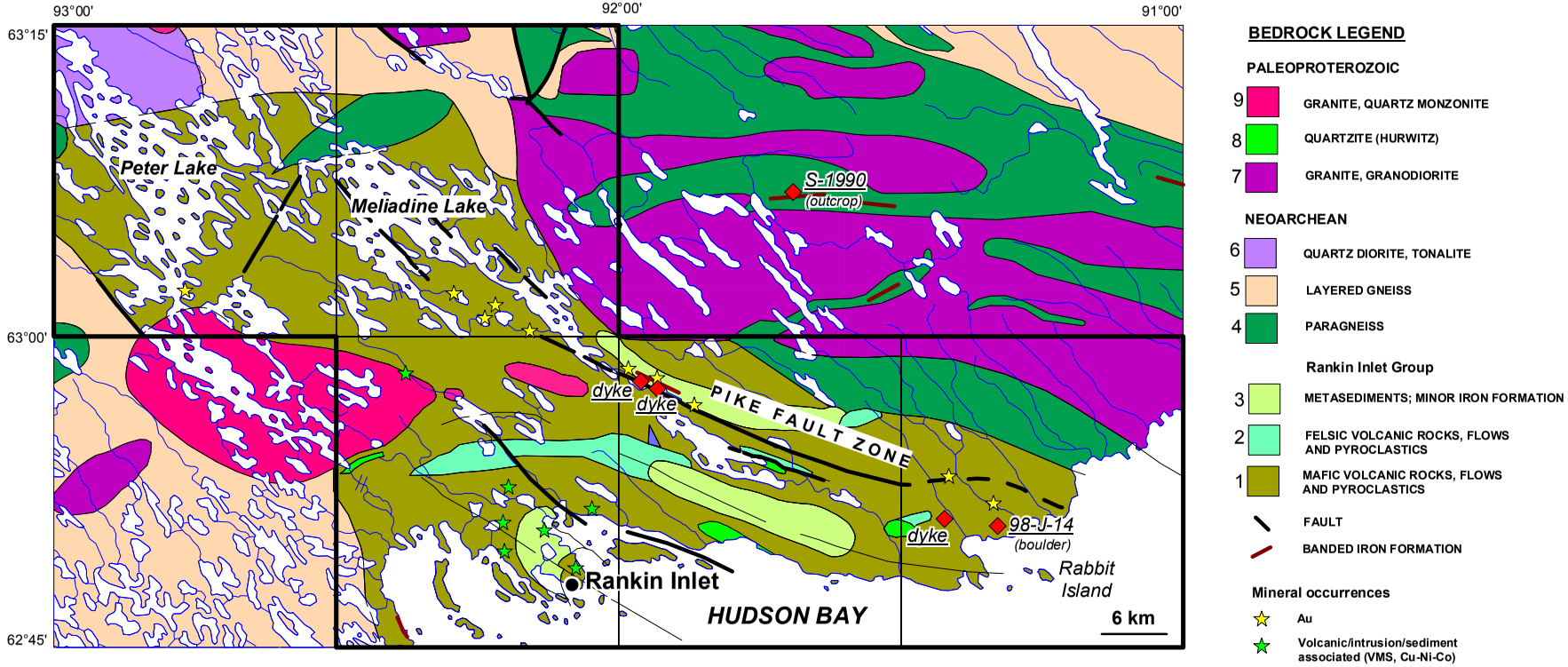

Figure 3. Bedrock geology map for Rankin Inlet study area (from Tella et al., 1997a). Approximate locations of kimberlite samples (S-1990 and 98-J-14) and known kimberlite dykes discussed in the text are shown by red diamonds.

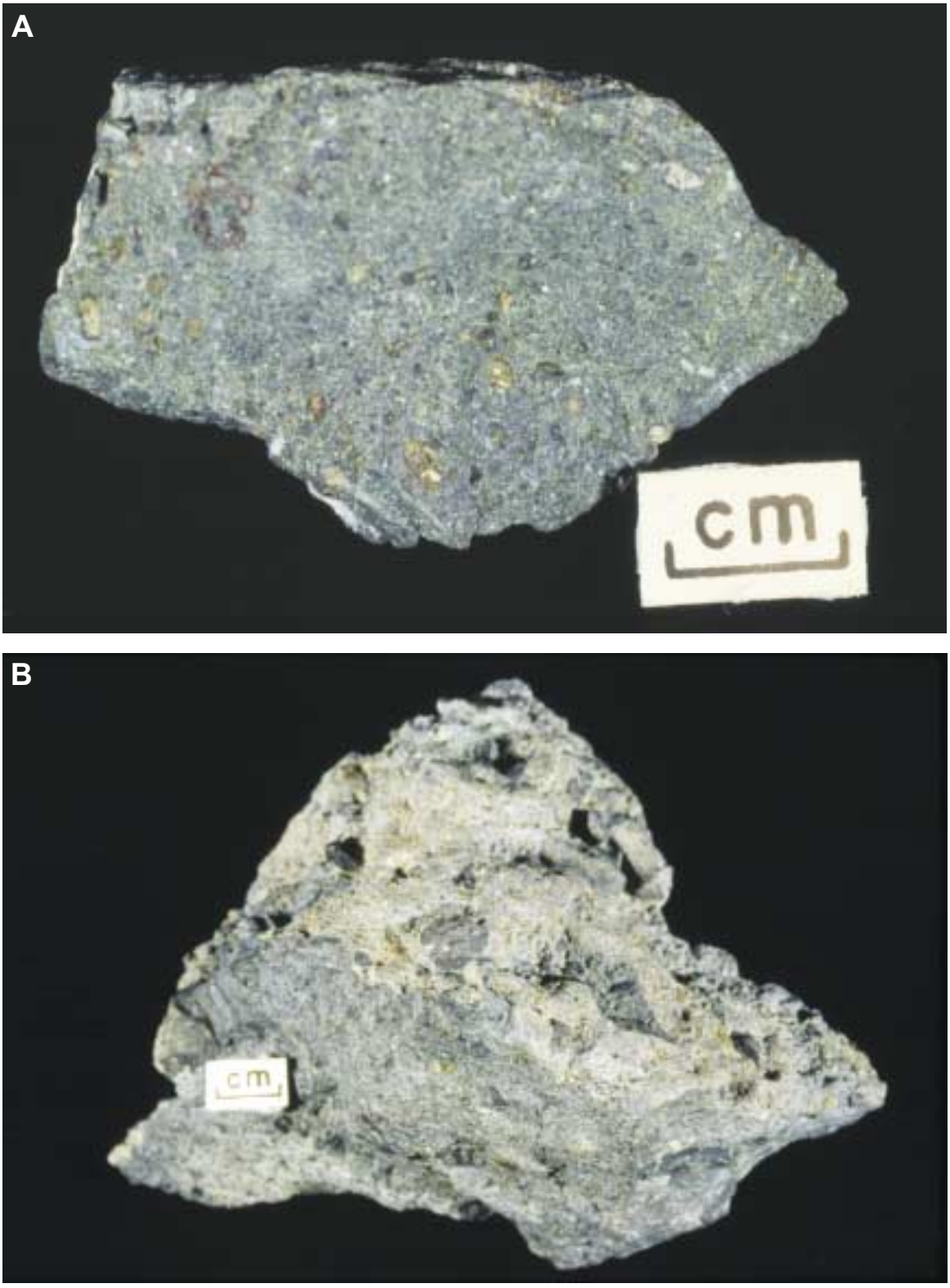

Figure 4. Photos of the two hand-sized kimberlite samples from the Rankin Inlet area: a) S-1990, b) 98-J-14.

Twenty-one regional till samples collected in the Rankin Inlet area by APEX Geoscience Ltd. in 2001 yielded diamond indicator minerals, including pyrope garnets (43% G10 subcalcic pyropes), eclogitic garnets (high Na_2O), chromites, ilmenites, chrome diopsides and olivines (Shear Minerals Ltd., Corporate news release, June 18, 2002). The indicator mineral chemistry suggested a new local kimberlite source, differing from the existing kimberlite and lamprophyre rocks known in the region. This finding resulted in the formation of the Churchill Diamond Project, an agreement between Shear Minerals Ltd. and Northern Empire Minerals Ltd. that includes the diamond mineral rights to the TrustMe Property, 540,000 acres of prospective ground in the Rankin Inlet area.

MacQuoid Lake study area

The MacQuoid-Gibson greenstone belt occurs as a linear structural domain, with a maximum width of approximately 25 km. The belt is oriented NE-SW and extends approximately 150 km from an area 10-15 km SW of Chesterfield Inlet to Kaminuriak Lake. The MacQuoid Lake study area (55M/7 and /10) lies within the western extent of this supracrustal belt. Bedrock geology in the MacQuoid Lake area comprises polydeformed and metamorphosed Archean supracrustal rocks composed of metavolcanic and metasedimentary rocks and layered quartzo-feldspathic gneisses of the MacQuoid-Gibson greenstone belt, intruded by late Archean granitoid complexes (Tella et al., 1997b)(Fig. 5). The metavolcanic rocks consist primarily of mafic to intermediate flows intercalated with volcaniclastic rocks, volcanic breccia and minor felsic units. Metasedimentary rocks include psammites, semipelites, pelites, and minor iron formation and polymictic conglomerate. Polydeformed, E to ENE trending metamorphosed diabase dykes and Paleoproterozoic granites intrude the Archean rocks. Lamprophyre, syenite and quartz-feldspar dykes transect the belt and trend SSE to SE. West and northwest of the study area, essentially unmetamorphosed late Paleoproterozoic sedimentary and volcanic rocks of the Dubawnt Supergroup outcrop (Hadlari et al., 2000; Rainbird et al., 2000).

The Akluilâk diamondiferous dyke, one of several unique diamond-bearing ultrapotassic lamprophyre dykes emplaced in the Paleoproterozoic (1832 ± 28 Ma; MacRae et al., 1996), lies approximately 120 km northwest of Rankin Inlet, in the Gibson Lake area (see Fig. 2 for location). This dyke is unique in its high concentration of microdiamonds (MacRae et al., 1996). Indicator minerals include forsteritic olivine, chrome spinel, garnet (G9), pyroxene (low chrome) and hornblende (MacRae et al., 1995). The Akluilâk dyke is not economic, but its presence indicates the formation and preservation of diamonds beneath the western Churchill Province.

Surficial geology

The surficial geology of the Rankin Inlet (55J, K and N) and MacQuoid Lake areas (55M) have been mapped by Aylsworth et al. (1981a, 1981b, 1981c, 1984)(1:125 000 scale), based primarily on air photo interpretation. Aylsworth and Shilts (1989) published a regional compilation of the distribution of glacial deposits and landforms for the Arctic mainland west of Hudson Bay, Districts of Mackenzie and Keewatin. As part of the Western Churchill NATMAP Project, the Rankin Inlet map sheet (55K/16) was recently compiled at 1:50 000 based on interpretation of air photos at 1:16 000 scale and extensive ground truthing (McMartin, 2002).

Nature of deposits

The Rankin Inlet and MacQuoid Lake areas are both located southeast from the main axis of the Keewatin Ice Divide, which is interpreted as the region towards which glacial ice receded during deglaciation on the west side of Hudson Bay (Shilts, 1980). The radial pattern of glacial features in the area reflects the redeposition of bedrock components by ice flowing from this centre

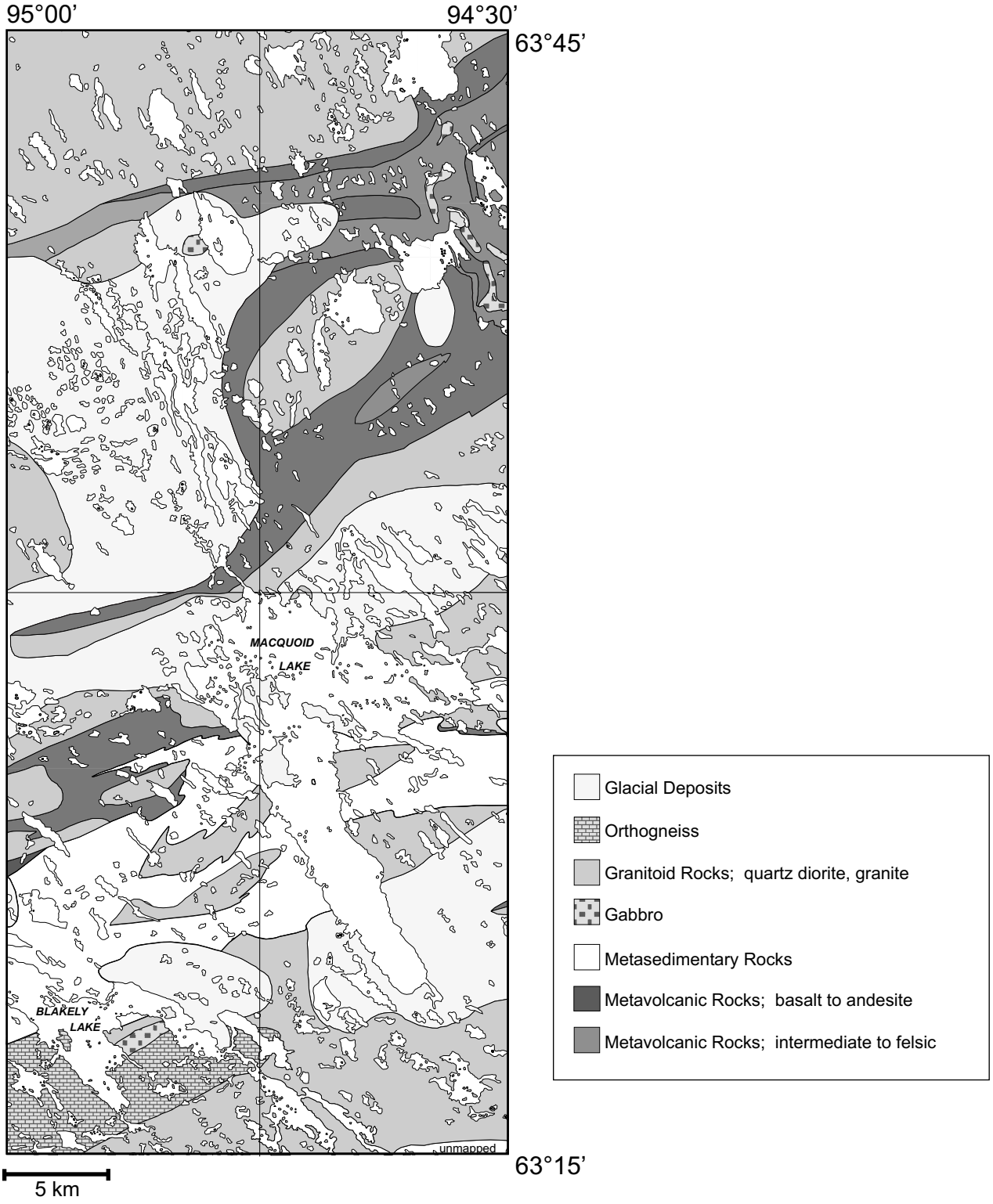

Figure 5. Bedrock geology of the MacQuoid Lake study area (simplified from Tella et al., 1997a).

(Aylsworth and Shilts, 1989). Within the study areas, hand dug pits, small natural sections and drill hole data indicate that till is the predominant surficial deposit and it forms the bulk of streamlined landforms, ribbed moraines, DeGeer moraines and hummocky moraines. Extensive and continuous esker systems are also present, occurring as ice contact stratified sand and gravel deposited by water flowing in tunnels or ice-walled channels within the glacier. Where breaks in deposition occur, esker segments are connected by subaqueous outwash sands or areas of bare bedrock. Individual esker systems exhibit a dendritic drainage pattern consisting of a trunk esker and associated bifurcating tributaries, which indicates flow away from the Keewatin Ice Divide. In the Rankin Inlet study area, four major continuous trunk eskers traverse the area from west to east (Fig. 6). These eskers are commonly beaded and aligned within major topographic lows. Till can be washed and eroded on either sides of esker systems (<2 km) as a result of meltwater flow, forming large hummocks and non-oriented ridges with accentuated relief, composed of poorly sorted, coarse-grained material (McMartin, 2002). In the MacQuoid Lake area, eskers form sinuous ridges essentially oriented in two main directions: N-S and NW-SE (Fig. 7). The southeasterly flowing esker is the trunk of a large esker system extending from the area of the Keewetin Ice Divide to Hudson Bay; the segments exhibiting southerly flow are interpreted as tributaries to this main system.

During deglaciation, between 7 and 6 ka BP (^{14}C), the region was largely inundated by the Tyrrell Sea, which fronted the retreating ice margin. Concurrent isostatic rebound caused a rapid rise in the land surface, and as the land emerged, till, glaciofluvial and marine sediments were reworked to varying degrees by nearshore marine processes. This led to reworking of upland surficial deposits into beaches, terraces and spits in places, and the accumulation of winnowed fine material in low-lying areas, many of which are occupied by lakes. Along the coast in the Rankin Inlet study area, below 30 to 60 m a.s.l., marine littoral sand and gravel, nearshore and tidal sands are predominant and fill lowland between bedrock outcrops (Fig. 6). Till, where preserved, is generally thin and wave-washed. In the MacQuoid Lake study area, the marine limit is 160 m. a.s.l. Nearshore marine sediment, consisting of well-sorted sand or gravel, is present as beaches, bars and spits formed on till and esker surfaces. Marine reworking, to varying degrees, is present at all elevations below marine limit and fine-grained sand and silt is present locally in topographic depressions. Throughout both study areas, younger alluvial sediment deposited as slope wash or by modern fluvial processes also occur in topographic lows, commonly overlain by shallow peatlands.

Ice flow patterns

An understanding of ice flow history is fundamental to drift prospecting in order to resolve sediment transport directions and interpret dispersal patterns observed in the compositional analyses of glacial deposits. The determination of ice flow is based primarily on the measurement of the orientation of glacial striae and grooves. Where possible, the trend is also determined from crag and tail relationships of various scales, crescentic gouges and fractures, chattermarks and roches moutonnées (Fig. 8). Relative ages are based on crosscutting striae or faceted outcrops with older striae preserved on protected surfaces (Lundqvist, 1990). A regional compilation of ice flow indicators for part of the NATMAP area, including the MacQuoid Lake map sheet (NTS 55M) and the Gibson Lake map sheet (55N), is given in McMartin and Henderson (1999).

In the Rankin Inlet area, ice flow indicators recorded on bedrock trend to the southeast, parallel to the long axes of lakes, streamlined landforms and roches moutonnées over the entire region (McMartin and Henderson, 1999)(Fig. 9). Directions shift slightly from west to east, from an average of 131˚ in the Peter Lake map area (55N/2) to 147˚ in the Scarab map sheet (55J/14).

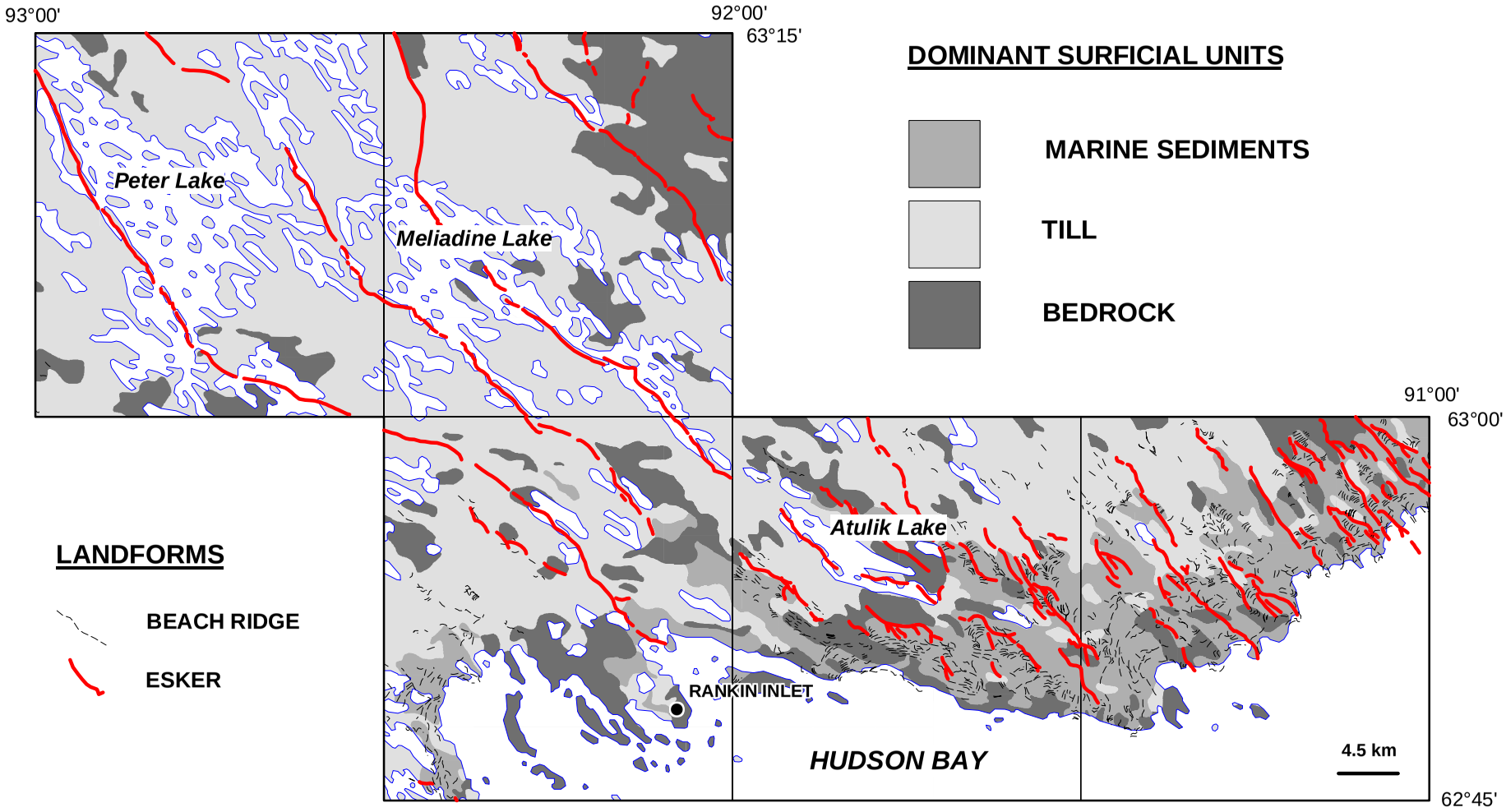

Figure 6. Generalized surficial geology map showing dominant surficial units, beach ridges and eskers (modified from Aylsworth et al., 1981a, 1981b, 1984).

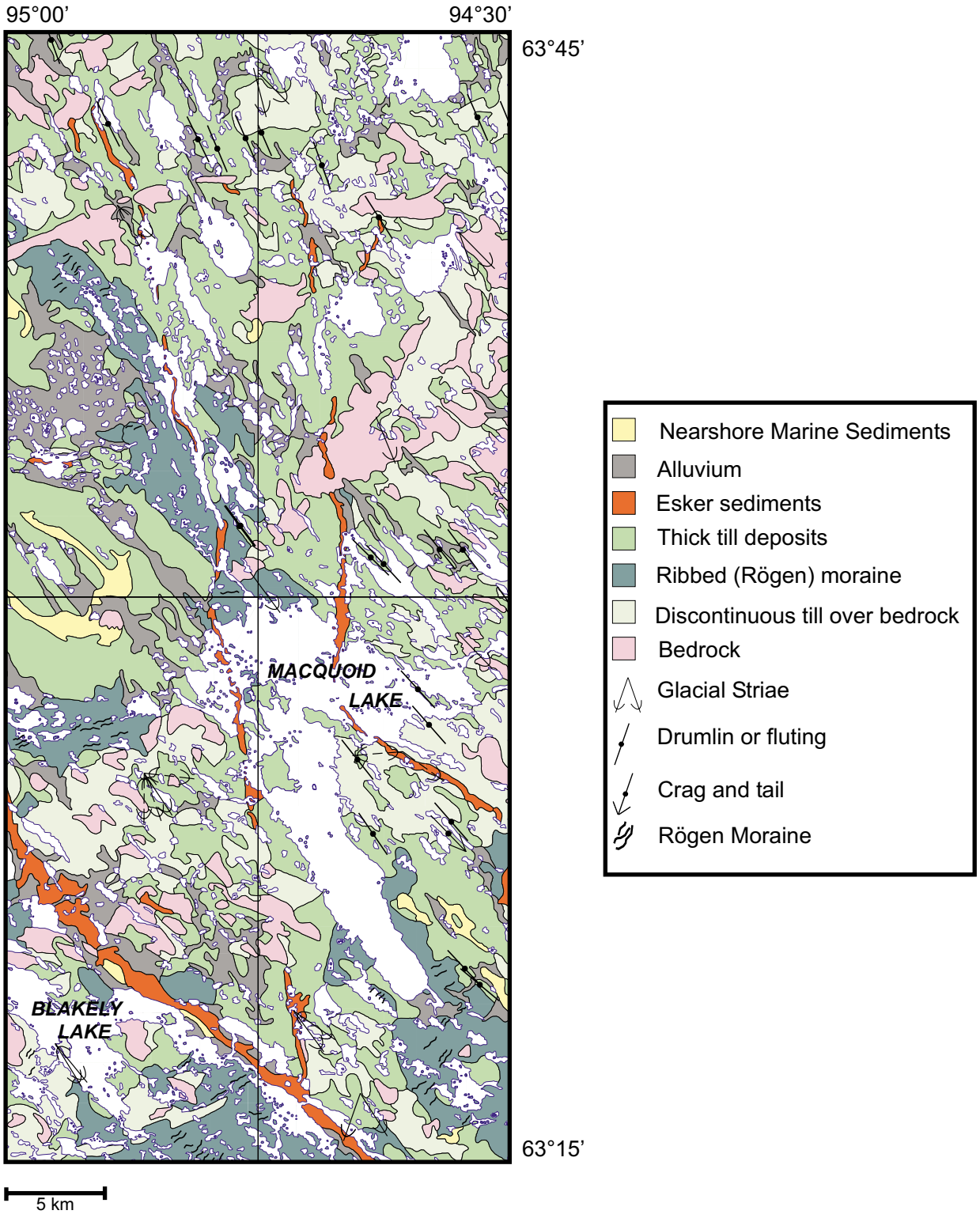

Figure 7. Generalized surficial geology for the MacQuoid Lake study area (after Aylsworth et al., 1981c).

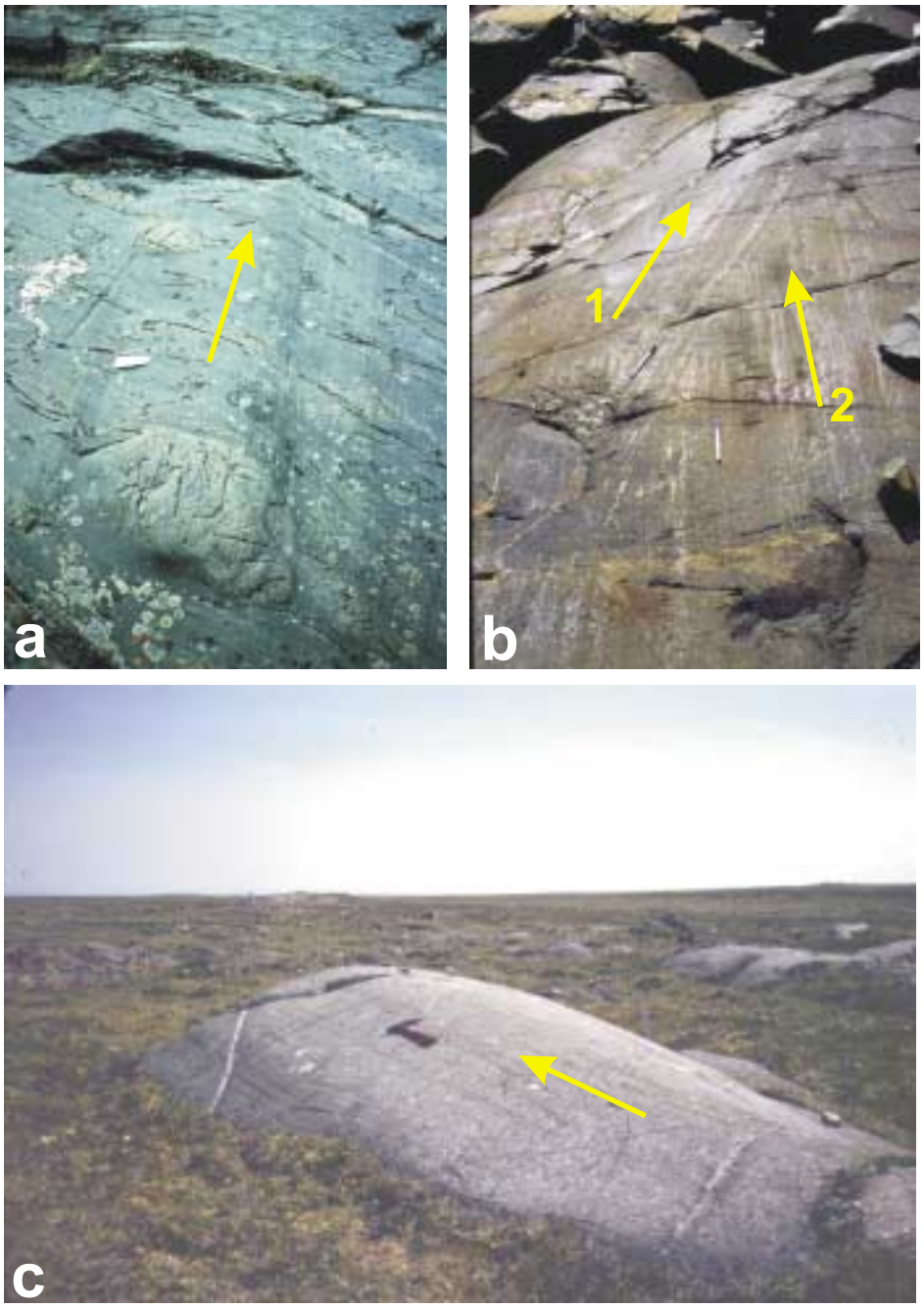

Figure 8. Examples of ice flow indicators: a) Striated rat tail developed in Rankin Inlet greenstone belt rocks. This rat tail indicates ice flow towards the SE along the coast in Rankin Inlet (away from the viewer); b) Two sets of striations are preserved here on a large island near Corbett Inlet (south of Rankin Inlet). Deep striae and grooves indicating ice flow towards the SE (1) are preserved on the lee side (north) of ESEward striated surfaces (2) which dominate the outcrops in the area; c) A roche moutonnée developed in mafic volcanic rocks near the "August zone", Meliadine East. This feature parallels the dominant and generally most recent ice flow event towards the SE (to the left).

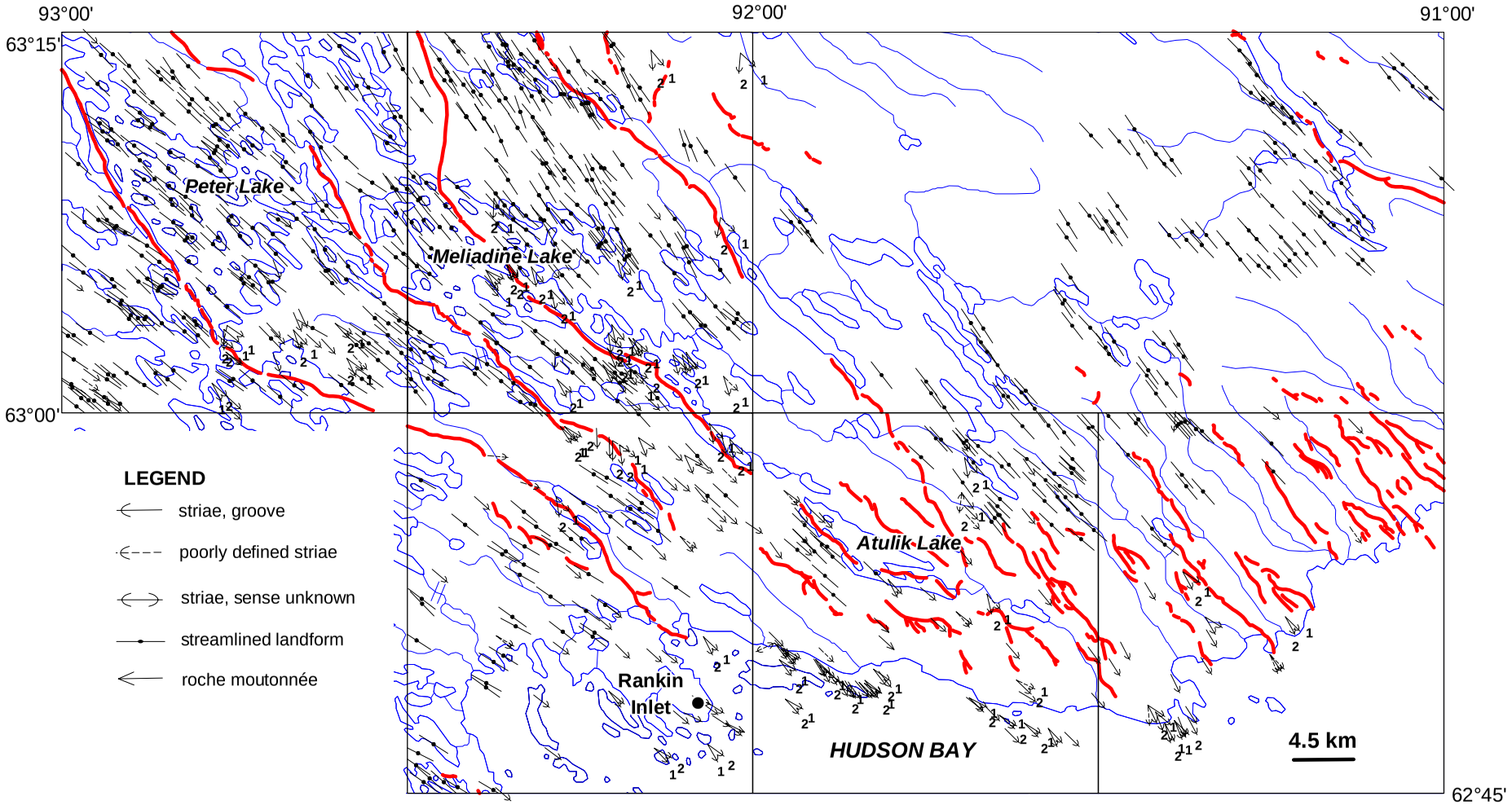

Figure 9. Ice flow indicators measured in the Rankin Inlet study area (1 = oldest). Streamlined landforms and eskers were taken from Aylsworth et al. (1981a, 1981b, 1984, 1986).

Two older regional ice flows mapped in the Kivalliq Region (McMartin and Henderson, 1999) have also been recognized in the area : 1) striations indicating a more south-southeasterly (149˚ to 152˚) flow and preserved on the lee-side of the regional southeast trending indicators were observed at a few sites in the western part of the area and south of Rankin Inlet, and 2) well-preserved surfaces with striations indicating an older flow to the east-southeast (114˚ to 122˚) were commonly found along the coast east of Rankin Inlet on recently emerged bedrock outcrops.

The MacQuoid Lake area is situated near the axis of the Keewatin Ice Divide (KID) and the ice flow record is more complex (McMartin and Henderson, 1999). A summary of all ice-flow data for the study area (55M/7 and 55M/10) is presented in Figure 10. The record of southeasterly ice flow from the KID dominates and is preserved in striae, flutes and crag-and-tail features. Evidence for an older southerly and southeasterly flow is indicated by poorly defined striae at several sites in the southern half of the map area. A younger, southerly ice flow direction has been interpreted from striae relationships in the northern part of the MacQuoid Lake area. The record of this late flow is less regionally extensive than earlier ones and indicates ice flow from a more northerly dispersal center, likely associated with the KID.

In both study areas, striae younger than the main southeast regional set are commonly found near large esker systems (<4 km). These striae are commonly oriented at right angle or oblique to the esker direction and to the SE trending drumlins. These relationships suggest local redirection of ice towards the esker ridge as deglaciation proceeded (i.e. Repo, 1954; Veillette, 1986).

Till composition

During the last glaciation, Keewatin Sector ice of the Laurentide Ice Sheet deposited a sandy till containing a mixture of local and exotic debris over the Kivalliq region. A dispersal pattern was mapped in till based on the relative proportion of granules derived from rocks of the Dubawnt Supergroup (Shilts et al., 1979; Kaszycki and Shilts, 1980). These rocks outcrop in the Baker Lake area, west of the two study areas, and are composed of relatively easily eroded sedimentary and volcanic lithologies that are distinctive, both in colour and composition, compared to the highly metamorphosed and deformed lithologies of the adjacent Archean terrane. The dispersal train extends over 300 km SE from the bedrock source, parallel to the latest dominant ice flow direction (Fig. 11). In the Macquoid Lake study area, till is characteristically a brown to reddish brown sandy diamicton and contains a high proportion of Dubawnt-derived material. Dubawnt clasts may comprise up to 50% volume by weight of the total granule fraction. It has been shown that tills enriched in Dubawnt erratics are depleted in most trace and major elements (Shilts, 1984). As a result, Dubawnt-derived tills tend to mask the geochemical signature of the underlying granite/greenstone terrane of the MacQuoid-Gibson greeenstone belt, and an inverse relationship is observed between Cu concentrations and the relative proportion of total Dubawnt granules in till (Henderson, 2000).

In contrast, the Rankin Inlet area lies at the edge of the southeastward Dubawnt glacial dispersal train, hence surface till clast composition and reddish color reflect the incorporation of far-travelled debris in the southwest part of area (up to 22% by weight), but not in the northeast where the majority of till samples are greyish to olive brown in color (<2%). The presence of exotic Dubawnt-rich debris in the southwest half of the area does not significantly depress the local bedrock signature in till. Till in the Rankin Inlet area is therefore generally locally derived and its provenance reflects a clear southeasterly direction of glacial transport. Manifestations of gold mineralization zones along the Meliadine Trend in till have been mapped for Au and associated

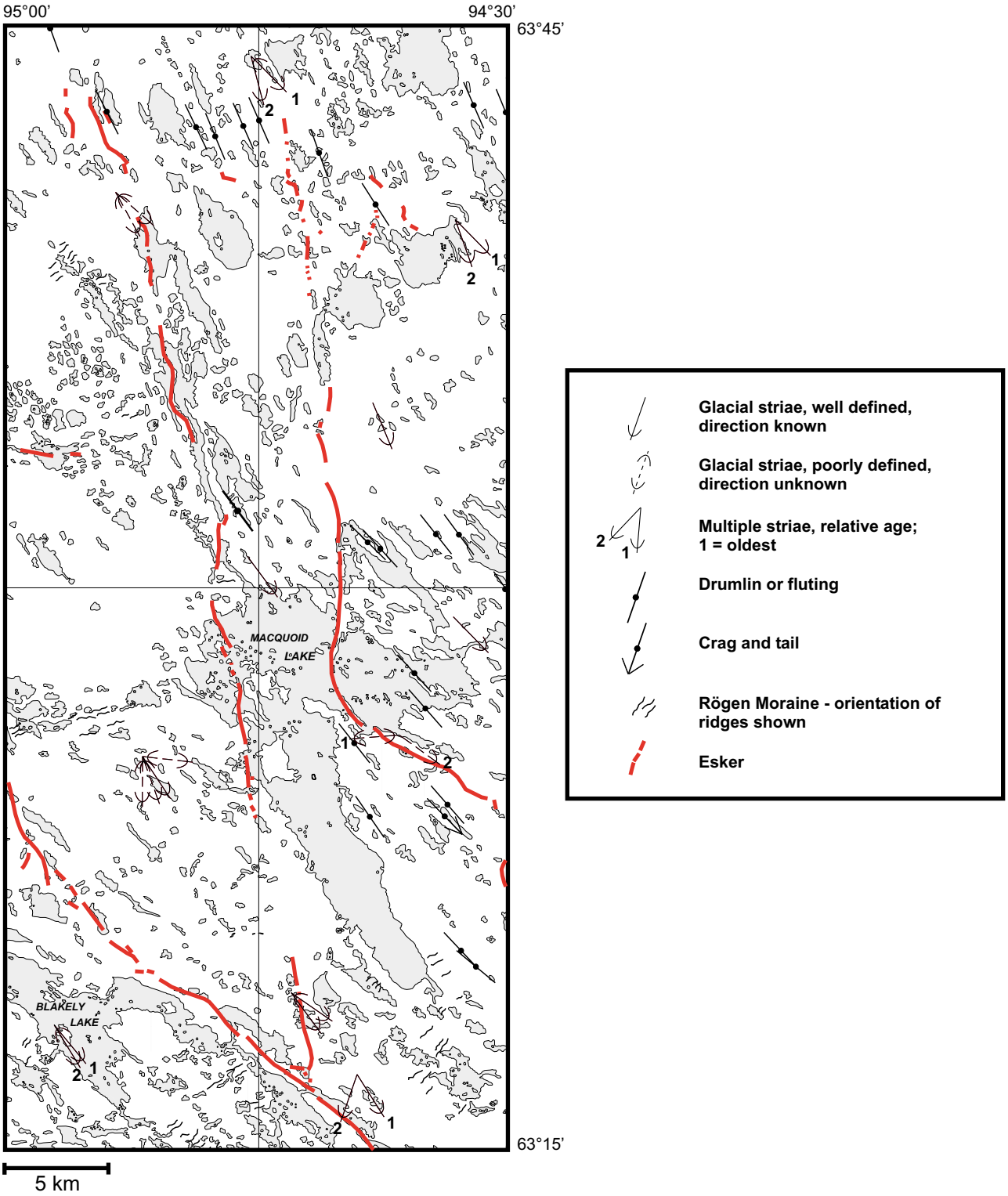

Figure 10. Ice flow indicators measured in the MacQuoid Lake study area. Streamlined landforms and eskers were taken from Aylsworth et al. (1981c).

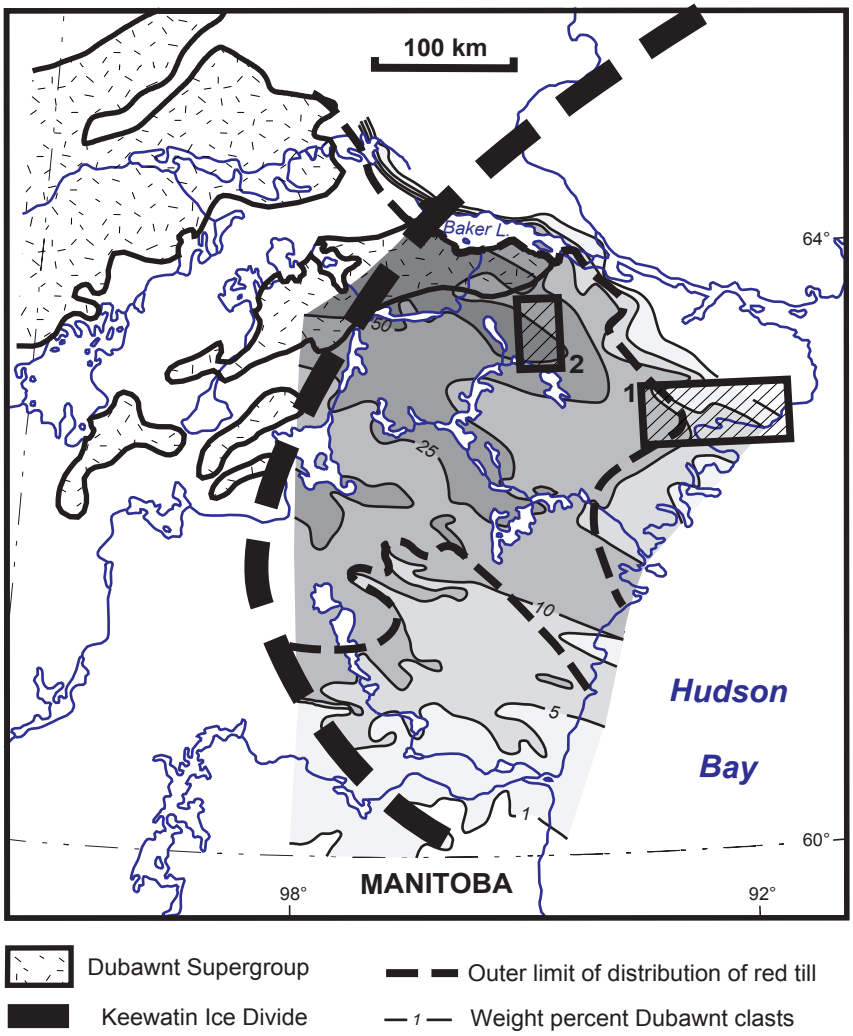

Figure 11. Dispersal of Dubawnt Supergroup erratics (2 to 6 mm fraction of till) and distribution of red till (from Shilts et al., 1979). The central axis of the Keewatin Ice Divide is shown as a thick dashed line. The two study areas are outlined: 1) Rankin Inlet, and , 2) Macquoid Lake.

pathfinder elements (As, Co, Cu, Fe, Ni, Pb and Zn)(McMartin, 2000).

METHODOLOGY

Field work was conducted in the Rankin Inlet area during the summers of 1997 through 1999 from the town of Rankin Inlet and from mineral exploration camps along the Meliadine Trend. In the MacQuoid Lake area, field work was conducted in 1998 and 1999 from two base camps organized by the Continental Geoscience Division of the Geological Survey of Canada. Access was by helicopter, boat and foot traverses.

Sample collection and processing

Fifty large (8 kg) bulk till samples were collected in the Rankin Inlet area for gold grain counts mainly along and down-ice from the Meliadine Trend (McMartin, 2000). Indicator mineral analysis were conducted on all of these samples (Fig. 12). For means of comparison, till samples in that area were classified in the field according to their degree of weathering, marine reworking or incorporation of marine sediments through periglacial activity (McMartin, 2000). In the MacQuoid Lake study area, 63 large (7 kg) bulk sediment samples (53 tills, 5 diamictons and 5 nearshore glaciomarine sediments) were collected for kimberlite indicator mineral analysis (Fig. 13). In addition, 8 till samples were collected west, northwest and east of the study area. All till and diamicton samples were collected from active mudboils at an average depth of 30 cm, to obtain relatively unoxidized representative material (Fig. 14). Sample locations and descriptions are presented in Appendix A.

Sample preparation and analytical procedures for the large bulk sediment samples are summarized in Figure 15. The samples were disaggregated and screened at 2 mm at Overburden Management Drilling Ltd. The <2 mm fraction was pre-concentrated with respect to density using a shaker table. The table concentrate was then put in methylene iodide (specific gravity of 3.3 for Rankin Inlet samples and 3.2 for MacQuoid Lake samples) and the heavy mineral concentrate (HMC) was collected. After a ferromagnetic separation, half of the nonferromagnetic heavy mineral concentrate (NFM-HMC) was screened to recover the <63 µm, 63-250 µm and 250 µm-2 mm fractions. The fine sand fraction of a selection of Rankin Inlet and MacQuoid Lake till samples was visually examined under the binocular microscope and counted by Consorminex Ltd. (Appendix B). The coarse sand fraction (250 µm-2 mm) was put aside for kimberlite indicator mineral analysis. Prior to indicator mineral picking, the heavy mineral concentrates were sieved to 0.25-0.50 mm, 0.5-1 mm and 1-2 mm. In addition to the regional till samples, the two hand-sized kimberlite samples from the Rankin Inlet area (S-1990: 0.8kg and 98-J-14: 2.5 kg) were crushed to <2 mm fraction, and separated for the HMC using a dilute methylene iodide liquid separation (s.g. 3.2). Ferromagnetic minerals were removed with a hand magnet. The NMF-HMC of sample 98-J-14 was screened at 0.5 and 1 mm. Because of an undersized 0.25 to 2 mm HMC fraction, bedrock sample S-1990 was not sieved to intermediate sizes. All fractions have been archived. Sample processing weights of selected size fractions are listed in Appendix C.

Indicator mineral picking and microprobe analysis

The NFM-HMCs of glacial sediment and bedrock samples were examined under a stereoscopic microscope for potential indicator mineral grains by I. & M. Morrison Geological Services Ltd. All grains considered to have possible kimberlitic affinities were hand picked. These grains included potential pyrope garnet, eclogitic garnet, Cr-diopside, Mg-ilmenite, Cr-spinels and olivine. In glaciated terrain, these minerals are known to survive both in-situ weathering of the kimberlite and subsequent glacial transport and post-depositional weathering (i.e., McClenaghan

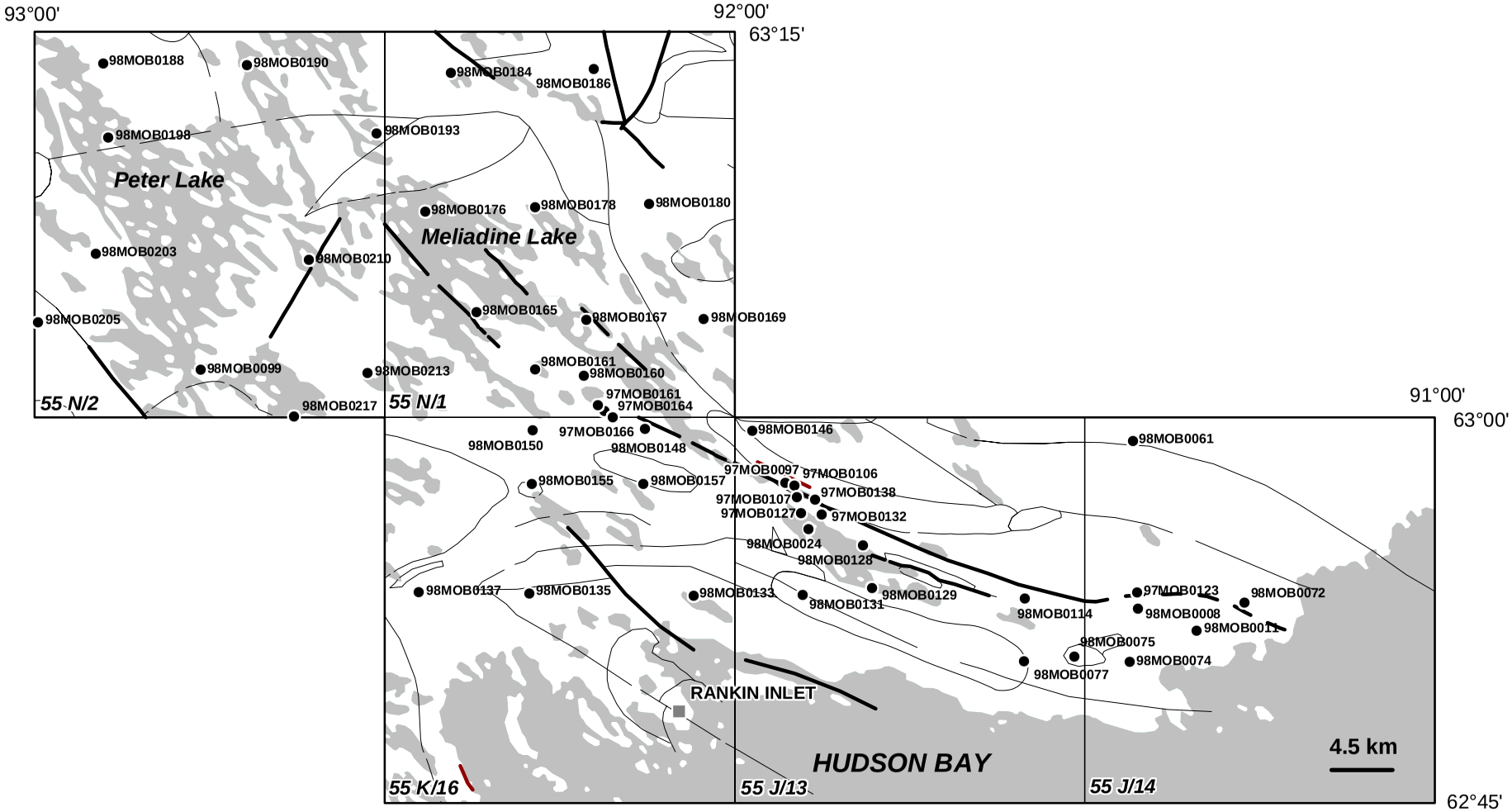

Figure 12. Till sample location map for kimberlite indicator mineral analysis in the Rankin Inlet study area. Outline of bedrock geology is shown (see figure 3).

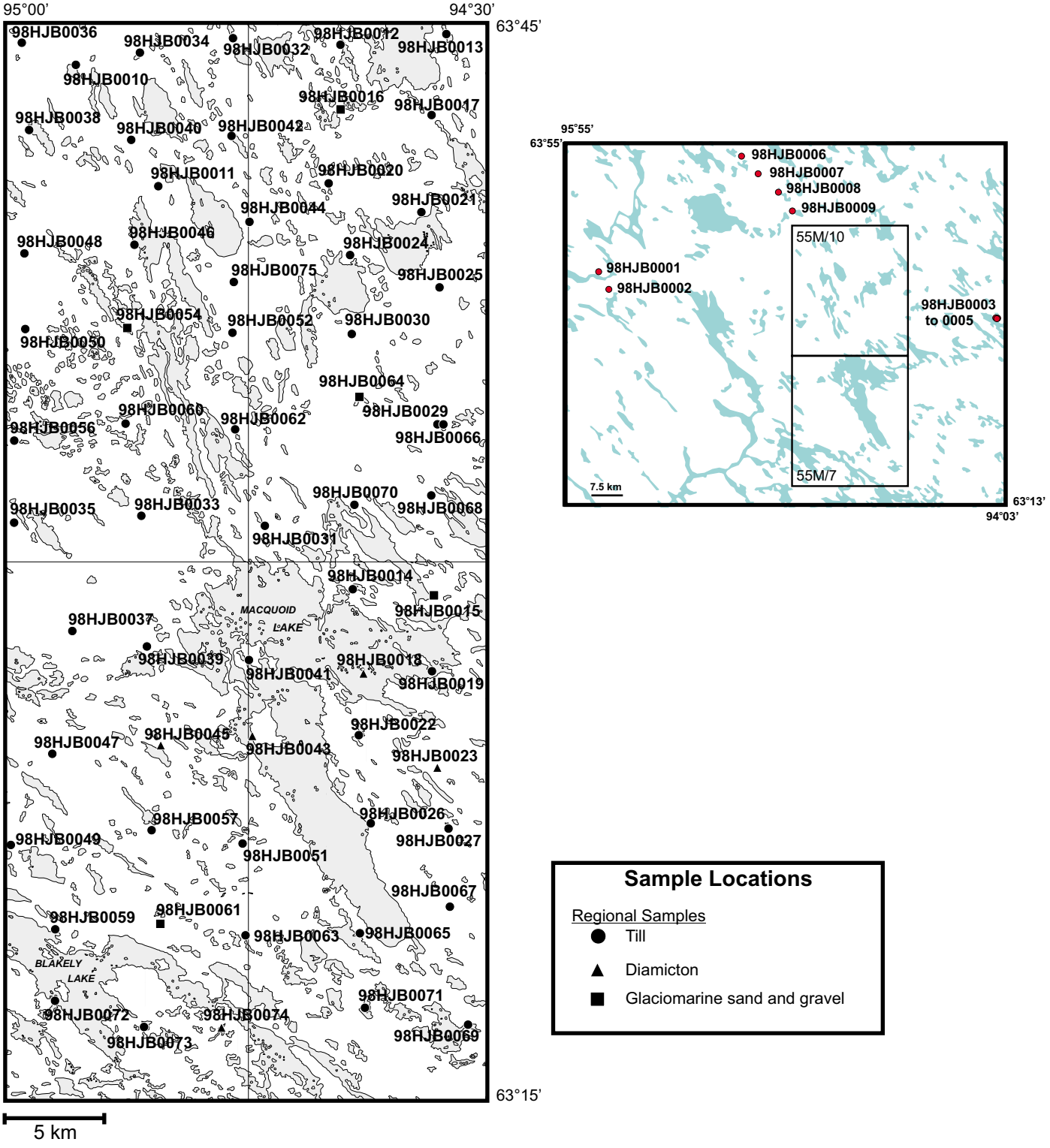

Figure 13. Sediment sample location map, MacQuoid Lake area (55M/7 and M/10). Smaller map on the right shows the location of till samples collected outside the MacQuoid Lake study area and analysed for kimberlite indicator minerals.

Figure 14. Till samples were collected from active mudboils with freshly extruded material in the centre surrounded by vegetation rim. Shovel is 15 cm wide.

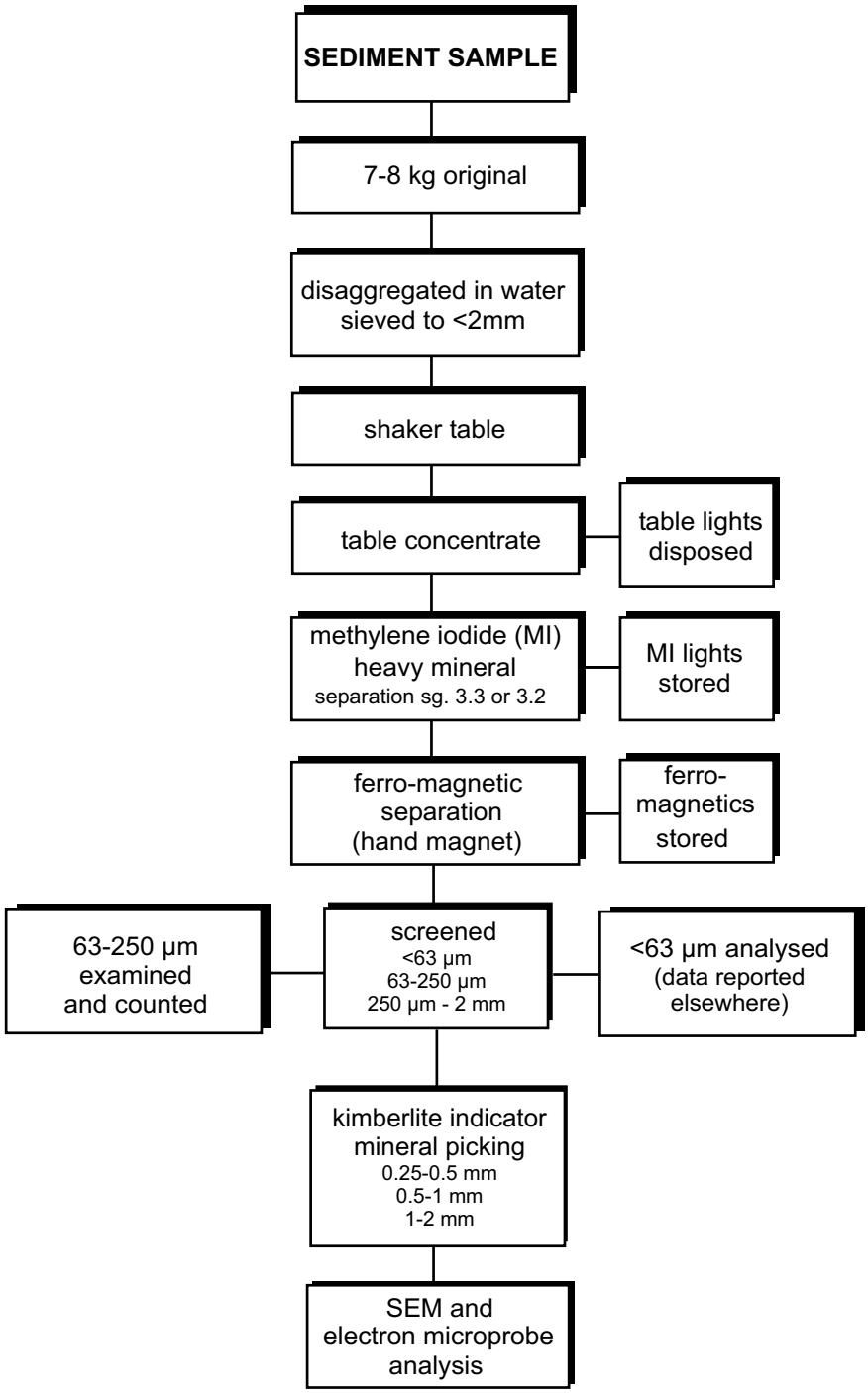

Figure 15. Flow diagram illustrating analytical scheme for glacial sediment samples collected in the Rankin Inlet and MacQuoid Lake areas.

et al., 1997). The chemistry of these grains has been used to determine their mode of occurrence in diamonds as inclusions or in kimberlites (cf. Dawson and Stephens, 1975; Gurney, 1984). All picked grains were mounted in 25 mm resin epoxy stubs at Overburden Drilling Management Ltd., and polished. Because of an abundance of olivine grains in kimberlite sample 98-J-14, only about 10-20 % olivine grains were picked in that sample. Enlarged colour prints and scanning electron microprobe (SEM) backscatter images of the grain mounts were used to aid mineral identification and to recognize possible inhomogeneities, intergrowths or exsolutions within individual grains.

The microprobe analyses were conducted at the Geological Survey of Canada Microbeam laboratory using a Cameca SX50 electron microprobe equipped with four wavelength-dispersive spectrometers. Operating conditions were 20kV accelerating voltage, 10 nA beam current using a focused spot. Count times on peak were 10 seconds, with 5 seconds off-peak. The raw data were processed with the ZAF matrix correction of Armstrong (1988). The standards used are a mixture of natural and synthetic pure metals, simple oxides and simple compounds.

Mineral identification

Minerals were identified and named using criteria similar to those of McClenaghan et al. (1999, 2000). The analysed grains were classified on the basis of their chemical composition. Theoretical chemical compositions of mineral end-members (LeMaitre, 1982) were used to calculate cut-off values (at approximately 50:50 mol %) for members of binary solid solution series. For minerals that contain substantial amounts of more than two end-members, the threshold values were lowered accordingly. Prefixes were added to some of the indicator mineral names to emphasize elevated contents of petrogenetically critical elements such as Mg, Cr and Ti which are important in distinguishing between potential kimberlite minerals and those from other bedrock sources. Threshold values for these prefixes were chosen in part from the indicator mineral chemistry of the two kimberlite samples, or arbitrarily based on other classifications used by GSC authors across Canada (i.e. Kerr et al., 1999; McClenaghan et al., 1999).

Kimberlite and till geochemistry

One hundred and eighteen 3-kg till samples collected as part of a regional till geochemistry survey (McMartin, 2000) were selected in the southern part of the Rankin Inlet study area for major and trace element geochemical determinations at GSC's Analytical Chemistry Laboratory (Fig. 16). The <0.063 mm fraction of till samples was prepared using the methods described in McMartin (2000). Approximately 1g aliquots of this fraction were analysed using ICP-ES for major elements, Ba and LOI following fusion and dissolution in a mixed lithium metaborate - lithium tetraborate solution (Method ICPES-100), ICP-MS for rare earth elements (Method ICPMS-100), and ICP-MS/ICP-ES for trace elements (Method ICPMS-110/ES-110) after total dissolution in nitric, perchloric and hydrofluoric acids followed by a lithium metaborate fusion. Kimberlite samples were analysed at XRAL (S-1990) and at the Saskatchewan Research Council (98-J-14) for whole rock major (ICP-fusion) and trace (ICP-multi-acid digestion) element geochemistry. Geochemical data for all till and bedrock samples are listed in Appendix D. Analytical quality control (QA/QC) was monitored by comparing duplicate analyses of selected samples and by analysing GSC in-house standards (Appendix D). All other till compositional results (pebble lithology, matrix mineralogy and geochemistry, heavy mineral geochemistry and gold grain counts) have been reported elsewhere (Henderson, 2000; McMartin, 2000).

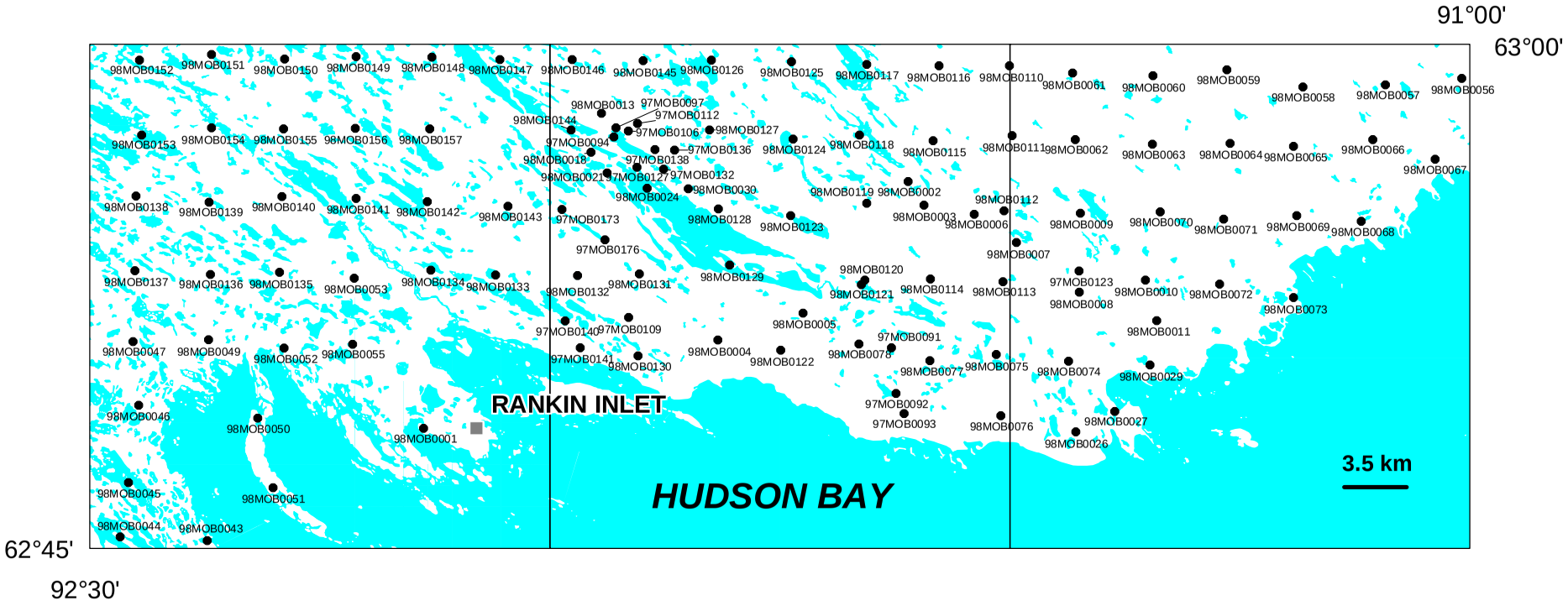

Figure 16. Till sample location map for geochemistry analysis (ICP-ES and MS, total leach), Rankin Inlet study area (55K/16, J/13 and J/14).

RESULTS AND DISCUSSION

Kimberlite indicator mineral chemistry and abundance

The total number of potential kimberlite indicator mineral (KIM) grains picked in each sample and for each size fraction is listed in Appendix E.1. 430 grains were picked out of the glacial sediment samples, mainly garnets, olivines and Cr-spinels (392 from the Rankin Inlet area and 38 from the MacQuoid Lake area); 425 grains were picked out of the two kimberlite samples, essentially Cr-spinels and olivines. Sixteen grains were lost during polishing therefore a total of 839 picked potential indicator mineral grains were analysed by electron microprobe to confirm and further classify their identity (Appendix E.2). The total number of indicator minerals <2.0 mm in each sediment and kimberlite sample is listed in Table 1. Those samples not listed do not contain apparent KIMs. Of the 839 grains, 449 were identified as kimberlite indicator minerals: 73 grains in Rankin Inlet till samples, primarily eclogitic garnets, Cr-diopsides and olivines; 14 in the MacQuoid Lake glacial sediment samples, essentially Cr-diopsides; and 362 grains in the two kimberlite samples, mainly Cr-spinels and olivines. The most important mineral groups are discussed below.

Olivine

Olivine occurs in abundance in basalts and other ultramafic rocks and is not unique to kimberlite. It is, however, the most abundant mineral in the upper mantle (peridotite). It occurs as a macrocryst and/or phenocryst phase in kimberlite, or as an inclusion in diamond from kimberlites and lamproites (Mitchell, 1986). Olivines in kimberlites and peridotites are known to be MgO-rich (forsteritic) and to contain traces of NiO (Fipke et al., 1995). An overlap in composition exists for olivine from diamondiferous and non-diamondiferous rocks and discrimination between sources can be difficult. Detailed glacial dispersal studies in the Kirkland Lake-Lake Timiskaming kimberlite field of northeastern Ontario have documented the unique indicator mineral signatures of individual kimberlites, including the use of olivine as an indicator mineral (McClenaghan et al., 1999). In this area, high Mg-numbers (>90) and high Ni levels suggest the olivine is from disaggregated peridotite xenoliths, and from olivine precipitated from the kimberlite magma at high pressure. Lower Mg-numbers (<90) and NiO<0.25% found in the smallest size fraction (0.25-0.5 mm) are interpreted to be low pressure kimberlite phenocrysts. Olivine grains in till down-ice from these kimberlites showed essentially the same range of Mg-numbers.

Euhedral to subhedral colourless to pale green olivine was the most abundant mineral picked from kimberlite sample 98-J-14 (n=142; 139 confirmed). No olivine was picked from kimberlite sample S-1990. Of the three size fractions examined in sample 98-J-14, olivine grains are most abundant in the 0.25-0.5 mm and 0.5-1 mm fractions (cf. Appendix E.1). They contain between 45.22 and 50.70 wt.% MgO and 7.93 and 14.44 wt.% FeO which corresponds to Mg-number 85 to 92 (Fig. 17a). NiO contents vary between 0.17 wt.% and 0.47 wt.% (1300-3700 ppm Ni). The olivines appear to fall into two groups, one ranging from Mg-number 89 to 92 with relatively high Ni contents (2000-3700 ppm) and another ranging from Mg-number 85 to 88 with lower Ni contents between 1300 and 2900 ppm. A general trend of decreasing NiO with increasing FeO contents is also observed for these grains, typical of groundmass olivines (<0.5 mm) in kimberlites (Mitchell, 1986).

Although a potential of 44 olivine grains from the Rankin Inlet tills were picked and microprobed, only 12 of these grains were confirmed as olivines after microprobe analysis. All other potential olivines were classified as epidote except one as titanite. Six potential olivine grains from the MacQuoid Lake sediments were analysed (one lost) and were classified as either epidote or diopside. Olivine grains from the Rankin Inlet till samples contain between 46.08 and 51.10 wt.%

Table 1. Kimberlite indicator minerals - Summary

Rankin Inlet Samples:

SAMPLE ID	Olivine	Cr-spinel	Cr-pyrope	Eclogitic garnet	Cr-diopside	Mg-ilmenite	TOTAL
97MOB0106	1	1	0	6	1	0	9
97MOB0107	0	0	0	1	0	0	1
97MOB0123	0	0	0	5	2	0	7
97MOB0132	0	0	0	4	0	0	4
97MOB0138	0	0	0	2	1	0	3
97MOB0161	1	0	0	5	2	0	8
97MOB0166	0	0	0	0	1	0	1
98MOB0008	4	0	0	0	1	1	6
98MOB0011	2	0	0	2	0	0	4
98MOB0024	0	0	0	0	2	0	2
98MOB0061	2	0	0	2	1	1	6
98MOB0072	0	0	1	0	1	1	3
98MOB0074	0	0	0	2	1	0	3
98MOB0075	0	0	0	0	2	0	2
98MOB0077	0	0	0	2	0	0	2
98MOB0128	0	0	0	1	0	0	1
98MOB0129	0	0	0	0	1	0	1
98MOB0148	1	0	0	0	1	0	2
98MOB0150	0	1	0	0	0	0	1
98MOB0155	0	0	0	0	1	0	1
98MOB0157	1	0	0	0	0	0	1
98MOB0167	0	0	0	0	1	0	1
98MOB0188	0	0	0	1	0	0	1
98MOB0190	0	0	0	0	1	0	1
98MOB0193	0	0	0	0	1	0	1
98MOB0203	0	0	0	0	1	0	1
	12	2	1	33	22	3	73

MacQuoid Lake Samples:

SAMPLE ID	Olivine	Cr-spinel	Cr-pyrope	Eclogitic garnet	Cr-diopside	Mg-ilmenite	TOTAL
98HJB0020	0	0	0	0	1	0	1
98HJB0021	0	0	0	0	3	0	3
98HJB0025	0	0	0	0	1	0	1
98HJB0047	0	0	0	0	1	0	1
98HJB0052	0	0	0	0	2	0	2
98HJB0062	0	0	0	0	2	0	2
98HJB0063	0	0	0	0	2	0	2
98HJB0073	0	0	0	0	1	0	1
98HJB0075	0	0	0	0	1	0	1
	0	0	0	0	14	0	14

Kimberlite Samples:

SAMPLE ID	Olivine	Cr-spinel	Cr-pyrope	Eclogitic garnet	Cr-diopside	Mg-ilmenite	TOTAL
S-1990	0	141	0	0	0	5	146
98-J-14	139	76	0	0	0	1	216
	139	217	0	0	0	6	362

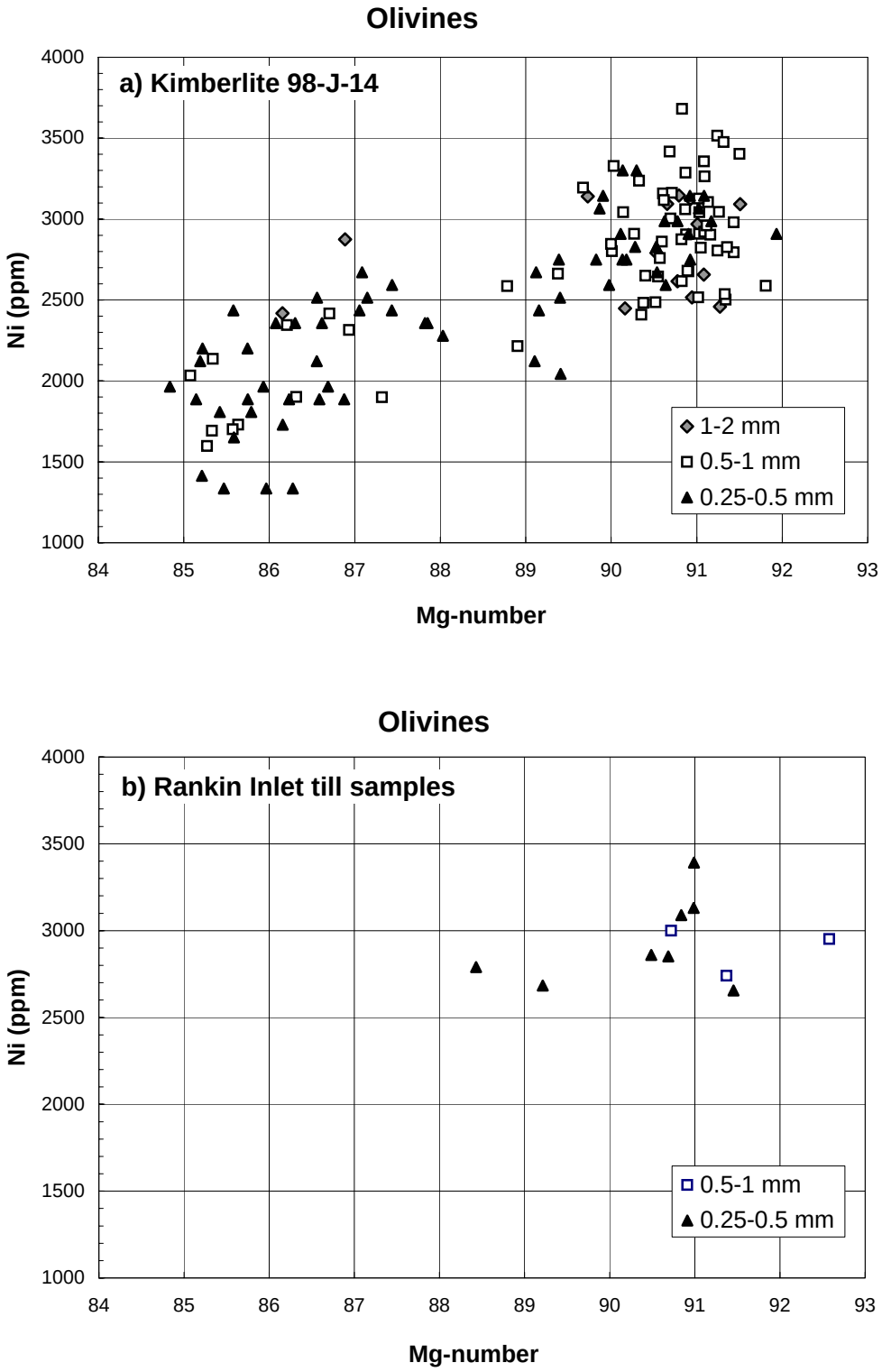

Fig. 17. Comparison of Mg-number (100*Mg/(Mg+Fe)) in olivines from different size fractions of heavy minerals in: a) kimberlite sample 98-J-14; b) till samples from Rankin Inlet.

MgO and 7.30 and 18.71 wt.% FeO which corresponds to Mg-number between 88 and 93 (Fig. 17b). Ni contents vary between 2600 ppm and 3400 ppm All grains have a similar composition to the olivine in kimberlite sample 98-J-14. The 12 olivine grains probed were found in 7 different till samples, including 3 samples which contained more than one olivine grain/per sample and collected in NTS 55J/14 (Fig. 18).

Cr-spinel

Chromite occurs in a variety of basic and ultrabasic rocks, including kimberlite. Spinels with high chrome contents (>25 wt.% Cr_2O_3), specifically black magnesio-chromite with >60 wt.% Cr_2O_3 and 12-16 wt.% MgO in kimberlite, have been found as inclusions in diamonds (Fipke et al., 1989, 1995; Gurney and Moore, 1993). They occur as octahedral crystals or more commonly as resorbed, irregular shaped crystals. They appear as black grains but may be reddish-brown when examined along thin edges.

Chromites were examined in both kimberlite bedrock samples. In sample S-1990, chromite constitutes the main indicator mineral species, with 195 potential grains picked (141 confirmed) in the 0.25-2 mm size fraction (essentially 0.25-0.5 mm size). In sample 98-J-14, it is most abundant in the 0.25-0.5 mm size fraction (n=85 grains; 76 confirmed). The analysed chromite grains from sample S-1990 have a narrow range of Cr_2O_3 contents, ranging from 37-48 wt.%, relatively high titanium (4-7 wt.% TiO_2), high magnesium (11-13 wt.% MgO), and high aluminium (8-12 wt. % Al_2O_3). Spinels of this composition are classified as titanian magnesian aluminous chromite (TIMAC), which is typical of the least evolved spinels trend 1, diagnostic of kimberlite (Mitchell, 1986). Spinels from sample 98-J-14 have very slightly lower Cr_2O_3 contents, ranging from 37-46 wt.%, slightly higher titanium (4-8 wt.% TiO_2) but lower aluminium (8-11 wt. % Al_2O_3), and high magnesium (11-13 wt.% MgO). Spinels of this composition are also classified as titanian magnesian aluminous chromite (TIMAC). The compositions of kimberlite spinel grains are shown on a bivariate plot of Mg-number versus Ti/(Ti+ Cr+Al) in Figure 19. This diagram illustrates that the groundmass spinels evolve to higher Ti contents at fixed Mg-number of 35 (i.e. kimberlite spinel trend 1 of Mitchell, 1986). The Cr_2O_3 versus MgO bivariate plots for spinel grains from the two kimberlite samples (Fig. 20) show that no grains contain sufficient Cr_2O_3 to plot in the diamond inclusion field defined by Fipke et al. (1989).

Thirty-six potential chromite grains were picked for microprobe analysis from the Rankin Inlet till samples. Only 2 of these grains were confirmed chromites. All other grains were reclassified mainly as either ilmenite, rutile or magnetite. The two chromite grains have a different composition from the kimberlite sample chromites suggesting a different source (Fig. 20). Both grains were picked from samples located immediately down-ice from the Meliadine Trend (Fig. 21). Moreover, they do not contain sufficient Cr_2O_3 to plot in the diamond inclusion field (Fig. 20). No chromite was picked from the MacQuoid Lake glacial sediments.

Cr-pyrope garnet

Pyrope garnet is chemically characterized by a high MgO content (>13 wt.% MgO) and varying amounts of Cr_2O_3 ranging from <1 to up to 15 wt.%. Pyrope with >2 wt.% Cr_2O_3 is classified as Cr-pyrope. Distinctively colored lilac or purple-red Cr-rich pyrope garnets have been widely used in many exploration programs for kimberlites as they unambiguously indicate the presence of upper mantle-derived material (Mitchell, 1986). Peridotitic Cr-pyrope garnet is subdivided on the basis of Ca content into wehrlitic (high Ca), lherzolitic, and harzburgitic (low Ca) affinities. Most peridotitic garnet inclusions in diamonds have low-Ca harzburgitic composition and

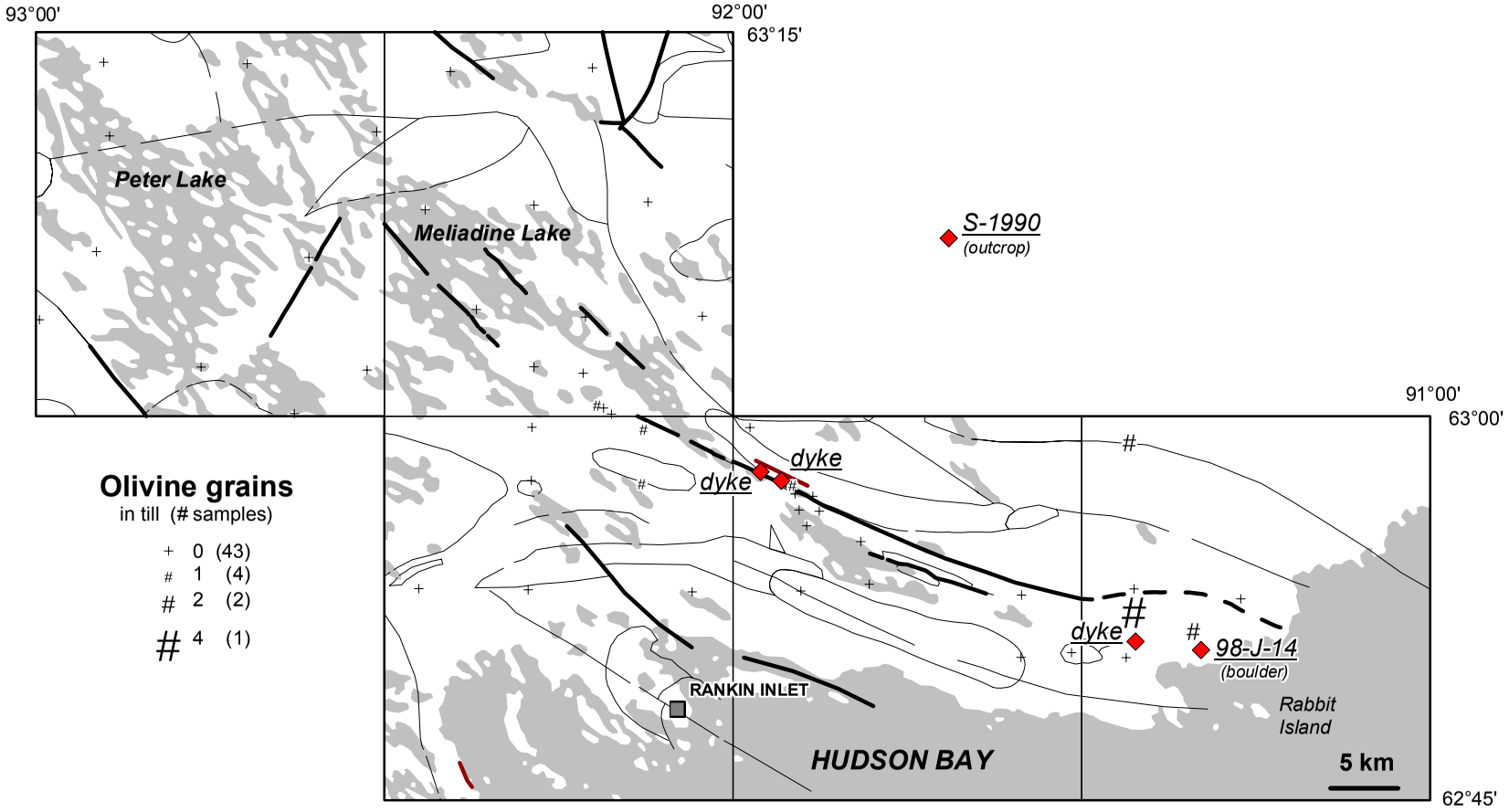

Figure 18. Olivine grains in Rankin Inlet till samples. Outline of bedrock geology is shown (see figure 3).

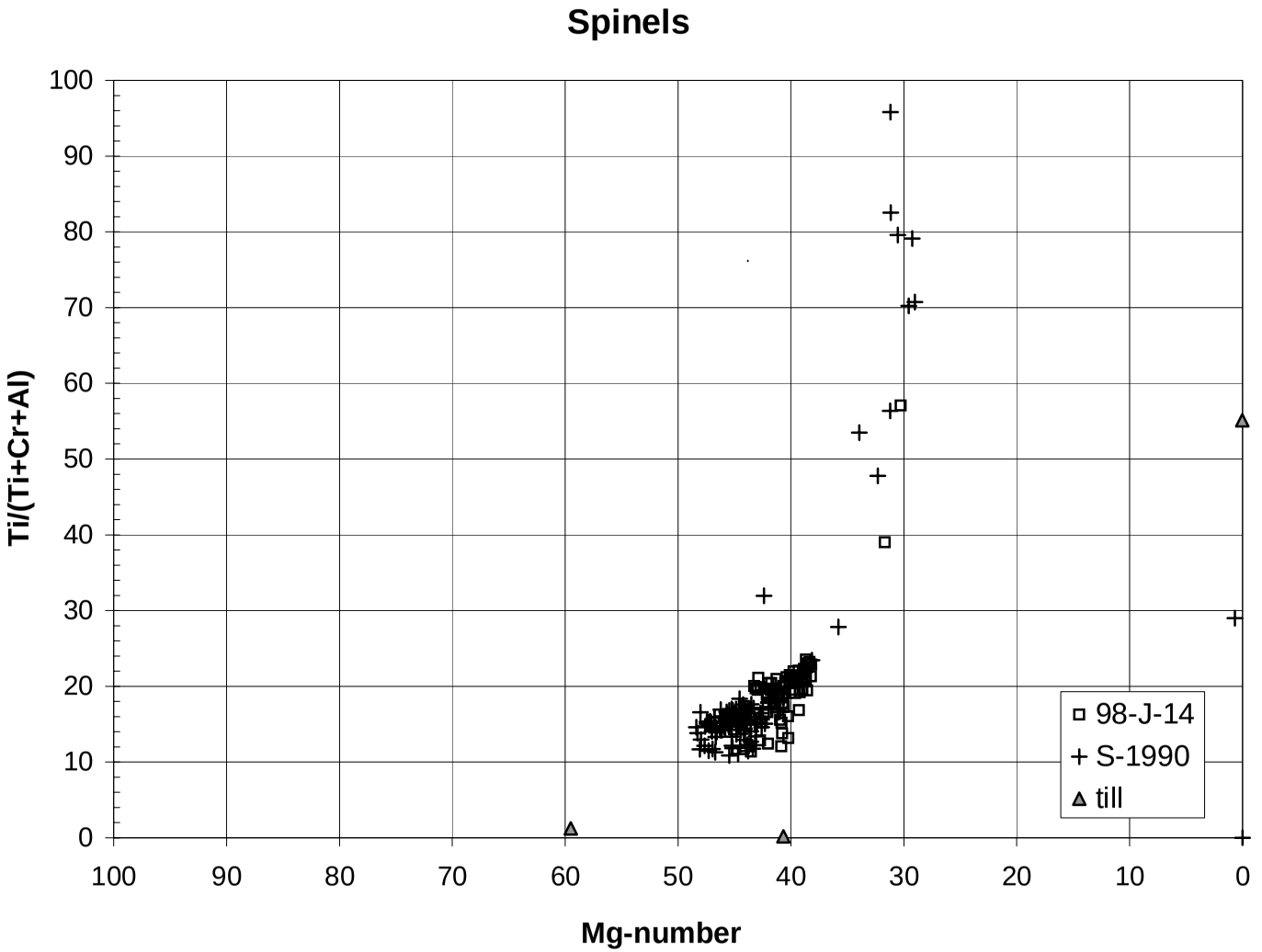

Fig. 19. Comparison of Mg-number (100*Mg/(Mg+Fe)) versus Ti/(Ti+Cr+Al) of all spinel grains (chromite, spinel, magnetite) from the two kimberlite hand samples (98-J-14 and S-1990) and from Rankin Inlet till samples.

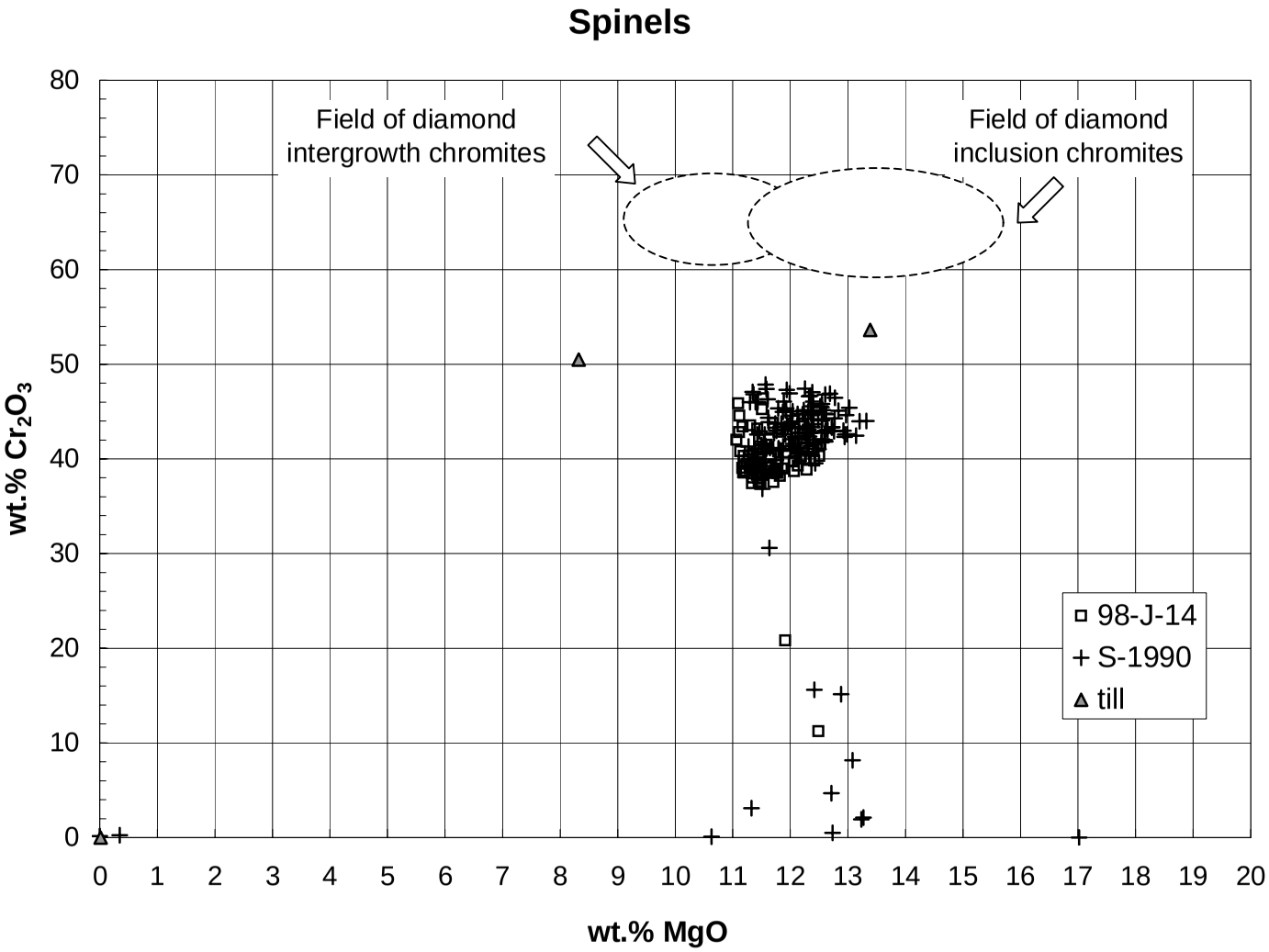

Fig. 20. Cr_2O_3 versus MgO content of all spinel grains (chromite, spinel, magnetite) from the two kimberlite hand samples (98-J-14 and S-1990) and till samples from Rankin Inlet. Diamond inclusion and intergrowth fields are from Fipke et al. (1995).

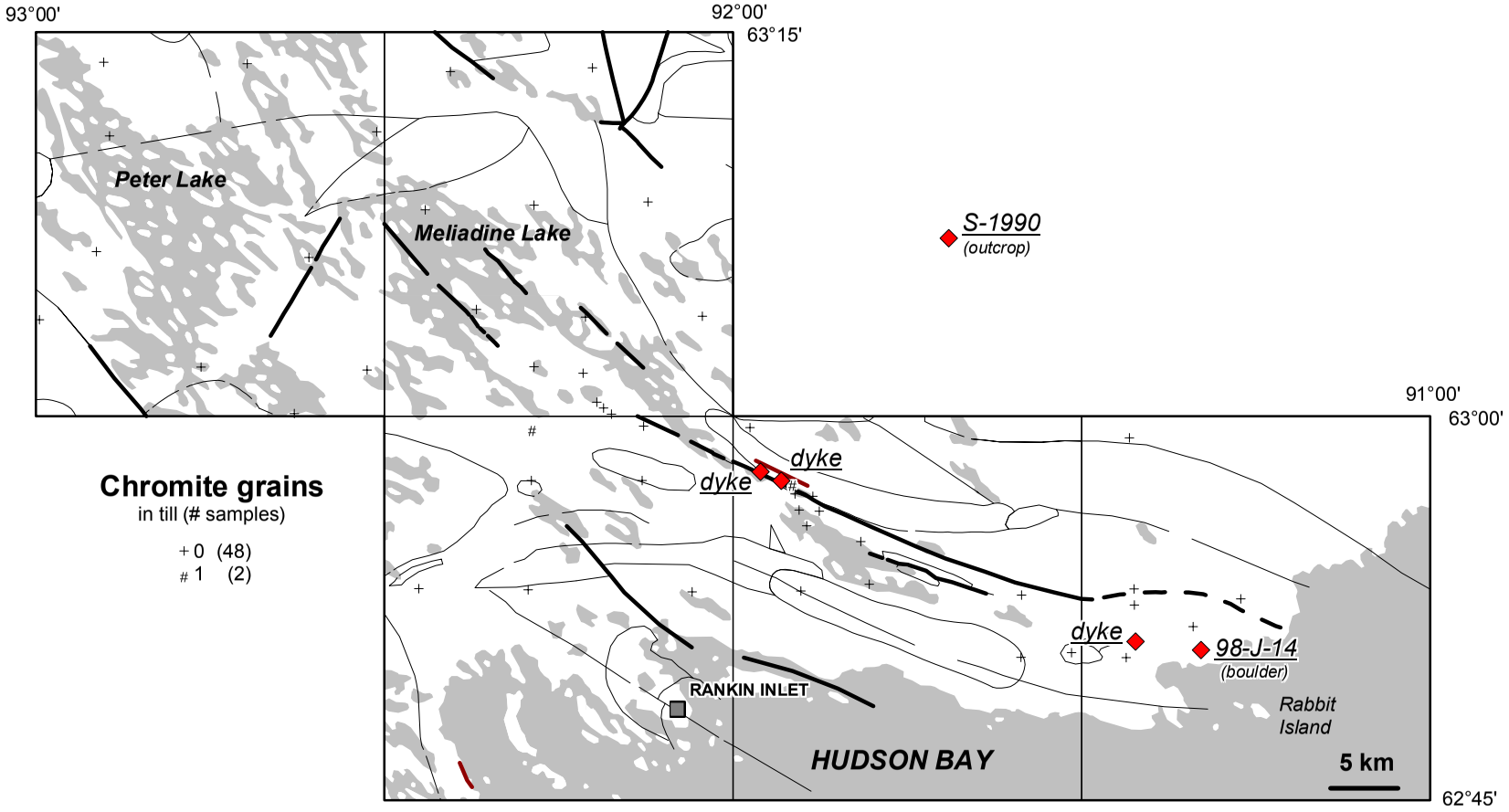

Figure 21. Chromite grains in Rankin Inlet till samples. Outline of bedrock geology is shown (see figure 3).

thus these garnets are sought in diamond exploration (Fipke et al., 1989, 1995). Lherzolitic (G9) and harzburgitic (G10) garnets are separated by a diagonal line in a Cr_2O_3-CaO bivarial plot (Fig. 22). This "85% line" was defined by Gurney (1984) and is based on a study of diamond inclusion garnets of which 85% fell below that line. On that same plot, the horizontal line drawn at 2 wt.% Cr_2O_3 is to discriminate between peridotitic (Cr-rich) and Cr-poor garnets which are either megacryst or eclogitic when they are found as inclusions in kimberlites. Red-brown Cr-Ti pyropes (<4 wt.% Cr_2O_3) comprise the megacryst population. These have not been found associated with diamonds.

Cr-pyrope garnets were not recognized in any of the heavy mineral concentrates from the two kimberlite samples nor from the MacQuoid Lake glacial sediments. One Cr-pyrope grain was picked from a till sample collected in the Rankin Inlet area along the eastern end of the Meliadine Trend in NTS 55J/14 (Fig. 24). Microprobe analysis on this grain indicates high MgO (20 wt.%), relatively high Cr_2O_3 (4.6 wt.%) and high CaO (5.6 wt.%). This chemistry suggests the grain is a kimberlitic garnet of peridotitic origin derived from garnet lherzolite (G9) (Fig. 22).

Eclogitic garnet

Mantle-derived yellow to orange-red pyrope-almandine-grossular garnets are from eclogitic xenoliths entrained in kimberlite. More specifically orange Na-bearing pyrope-almandines containing <2 wt.% Cr_2O_3 and significant trace amounts of Ti have been found as inclusions in diamondiferous kimberlites (Group I eclogites). Sodium content equal or greater than 0.07 wt.% Na_2O is considered to indicate equilibrium at pressures high enough to be compatible with the presence of diamond (Gurney, 1984).

A significant number of orange to red garnets of potential eclogitic source were picked from the Rankin Inlet till concentrates for microprobe analysis (n=261grains). These were mainly abundant in the 0.25-0.5 mm size fraction (n=242). Only 4 potential eclogitic garnets from the MacQuoid Lake sediments and none from the two kimberlite samples were picked for microprobe analysis. The majority of the picked garnets analysed were classified as almandine-pyrope-grossular and spessartine of crustal origin. A total of 33 eclogitic garnets of potential mantle source have been recognized in 12 Rankin Inlet till samples located predominantly along the Meliadine Trend, immediately down-ice from major gold occurrences, or within the eastern part of the study area (Fig. 25). These garnets have high MgO (>5 wt.%), high CaO (>4 wt.%), low FeO total (<22 wt.%), and plot in the E-type garnet worldwide diamond inclusion field (Fig. 23). Sodium values for these grains are not reliable as extended counting times for Na was not employed therefore these grains cannot be classified as potential Group I or Group II E-type garnets. Fourteen additional eclogitic garnet grains having similar composition were removed from being potential mantle eclogites because they plotted outside the diamond inclusion field, in the same region than some crustal eclogite garnets from xenoliths in the Cross Lake shear zone located 150 km up-ice from Rankin Inlet (R. Berman, pers. com., 2003). Moreover, because other Cross Lake crustal eclogite garnets plot in the diamond inclusion field and overlap in composition with some of the E-garnets in Rankin Inlet till, it remains unclear if the Rankin Inlet eclogitic garnets are derived from kimberlite.

Cr-diopside

Kimberlites contain diopsides with a wide range of Cr_2O_3 content (Stevens and Dawson, 1977) and it becomes difficult to discriminate between kimberlitic Cr-diopsides and Cr-rich diopsides found in ultramafic rocks. High-Cr diopsides (>1.5 wt.% Cr_2O_3) are most likely from kimberlites and emerald green Cr-rich diopsides (>0.5 wt.% Cr_2O_3) have been commonly used in glaciated terrain to indicate the presence of kimberlite (McClenaghan et al., 1999; Thorleifson et

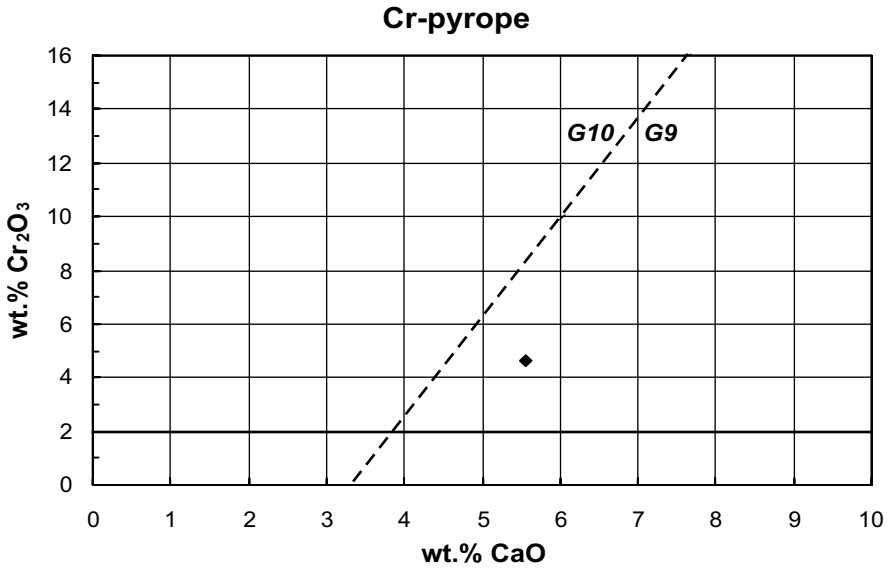

Fig. 22. Cr_2O_3 versus CaO content of Cr-pyrope grain from Rankin Inlet till sample 98MOB0072. Diagonal line separates G9 from G10 garnets ("85% line" of Gurney, 1984). Vertical line at 2 wt.% Cr_2O_3 separates eclogitic garnets below the line and peridotitic garnets above it (Fipke et al., 1995).

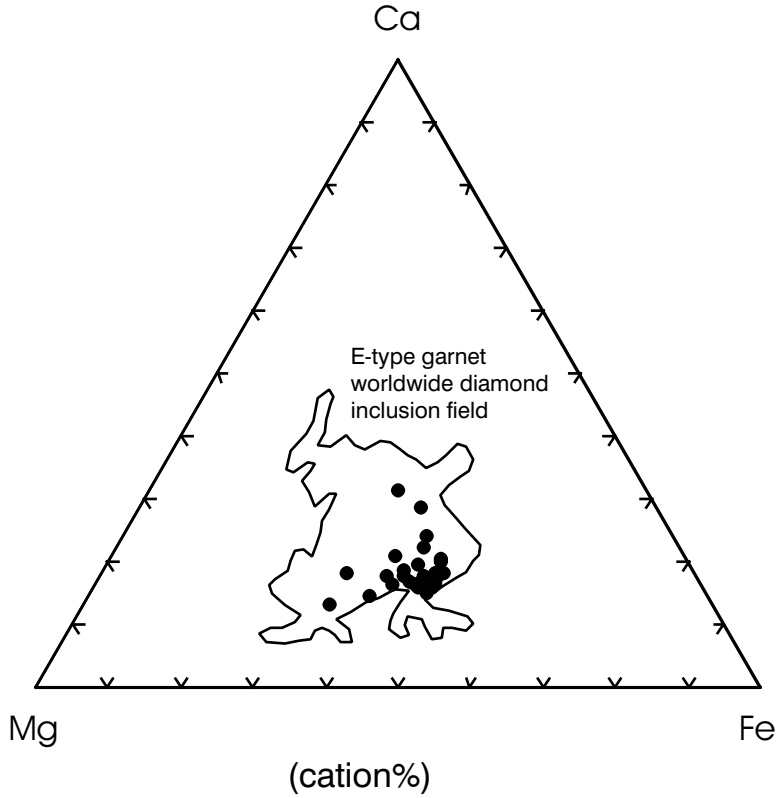

Fig. 23. Ternary diagram for potential eclogitic garnets from Rankin Inlet till samples.

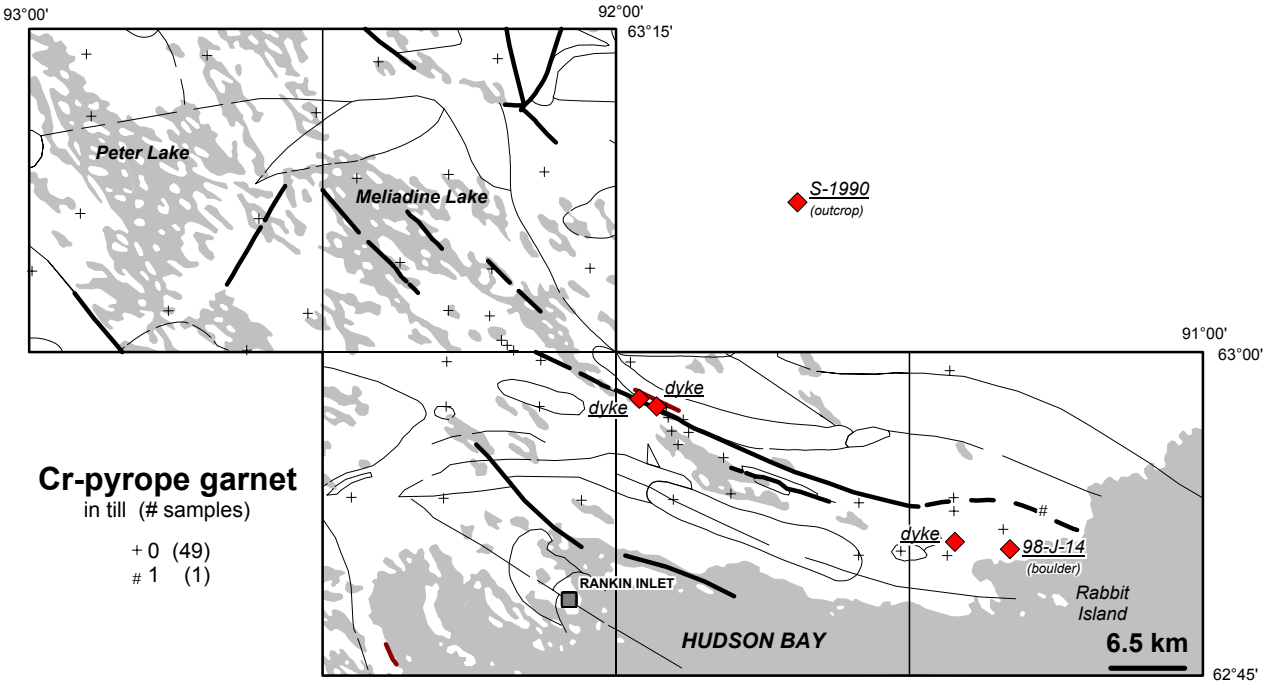

Figure 24. Cr-pyrope grains in Rankin Inlet till samples. Outline of bedrock geology is shown (see figure 3).

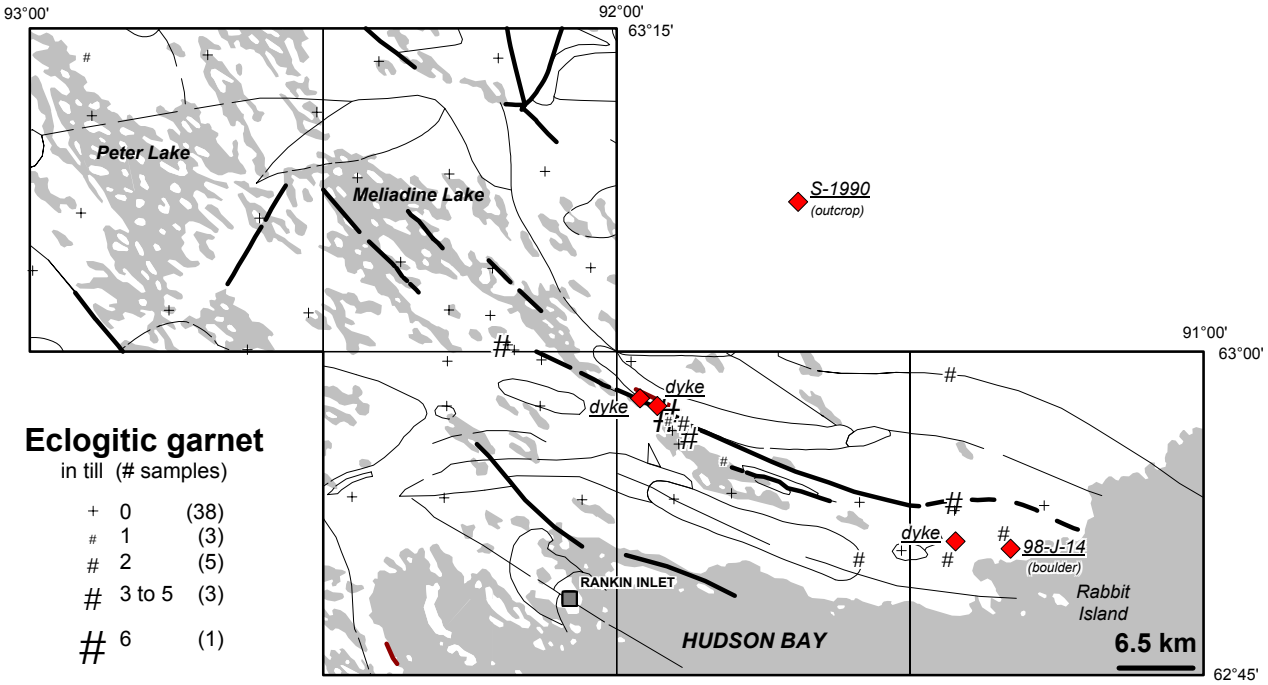

Figure 25. Potential eclogitic garnet grains of mantle source in Rankin Inlet till samples. Outline of bedrock geology is shown (see figure 3).

al., 1994). In all cases, Cr-diopsides provide little information on the diamond grade of kimberlite.

Potential Cr-diopsides were picked in both Rankin Inlet till samples (n=28) and in MacQuoid Lake glacial sediments (n=22), all in the 0.25-0.5 mm size fraction. No diopside grains were picked from the two kimberlite hand samples. Microprobe analysis of these grains indicates that they can be divided into two groups based on their Cr_2O_3 content (Fig. 26): 1) diopside (<0.5 wt.% Cr_2O_3: n=15) and 2) Cr-diopside (0.5 to 1.5 wt.% Cr_2O_3: n=36). No high-Cr diopsides (>1.5 wt.% Cr_2O_3) were identified in any of the samples. The Cr-diopsides have high Mg-numbers (83 to 93), similar to the range previously noted in olivines from kimberlite 98-J-14 and from Rankin Inlet till samples (cf. Fig. 17). The Cr-diopsides from the MacQuoid Lake area (n=14) were largely picked from samples located over or immediately down-ice from basic volcanic rocks (basalt to andesite) and gabbros (Fig. 28). This distribution and the low Cr content (mainly <1 wt.% Cr_2O_3) suggest they are derived from local, non-kimberlitic bedrock. DiLabio and Knight (1998) presented similar results and interpretation for samples collected south of Baker Lake, immediately west of the MacQuoid Lake study area. The Rankin Inlet Cr-diopsides (n=22) were picked mainly from samples collected over Rankin Inlet Group rocks on either side of the Meliadine Trend (Fig. 29), which may also suggest they are derived from local ultramafic rocks. In this area, however, kimberlitic sources for the Cr-diopsides cannot be completely ruled out, because Cr-diopsides commonly occur in till samples with other kimberlite indicator minerals.

Mg-ilmenite

Ilmenite analyses have been used to forecast a diamond preservation potential factor, specifically using plots of Cr_2O_3 versus MgO (Fipke et al., 1995). This factor represents an estimate of the percentage of the original diamond population sampled by the kimberlite which will survive the intrusion event. Kimberlite ilmenites can be distinguished from ilmenites from other rocks by their high MgO content, typically higher than 4 wt.% MgO (Mitchell, 1973; Haggerty, 1975).

A small number of metallic black ilmenites with conchoidal fractures on broken surfaces were picked as potential Mg-ilmenite from the Rankin Inlet and MacQuoid Lake samples (n=27), mainly in the 0.25-0.5 mm size fraction. However, several grains picked as chromites in these sediments turned out to be ilmenites (n=26). Trends in MgO and Cr_2O_3 contents of ilmenites shown on Figure 27 indicate that many ilmenite grains in sediments are regional ilmenites from non-kimberlitic sources with low MgO contents (<1 wt.%). Only three grains from the Rankin Inlet till samples are MgO rich (>4 wt.%), suggesting a good diamond preservation potential (Fipke et al., 1995), and they were all picked from till samples collected in NTS 55J/14 (Fig. 30). One grain with 1.7 wt.% MgO was picked from a sample that contained a suite of kimberlite indicator minerals and is plotted on Figure 30 (97MOB0161). In the MacQuoid Lake glacial sediments, one grain picked as ilmenite turned out to be a rutile; all other ilmenite grains (n=4) have low MgO contents (<1 wt.%). Although no grains were picked as ilmenites in the two kimberlite hand samples, 18 potential chromite grains picked from both samples were reclassified as ilmenites after microprobe analysis, including five Mg-ilmenites (>3.5 wt.% MgO) in S-1990 and one Mg-ilmenite in 98-J-14 (Fig. 30).

Kimberlite geochemistry

Whole rock major and trace element chemistry for the two hand-sized kimberlite samples collected in the Rankin Inlet area are listed in Appendix D.2. Both samples have a geochemistry that is relatively typical of kimberlites i.e. low Si, Al and high Mg, volatiles, Sr, Ba, Nb, Zr, La/Yb_n. However, sample S-1990 is somewhat unusual in that compared to many kimberlites: MgO is low (<20 wt.%), and CaO and P_2O_5 are relatively high. These elemental abundances are consistent

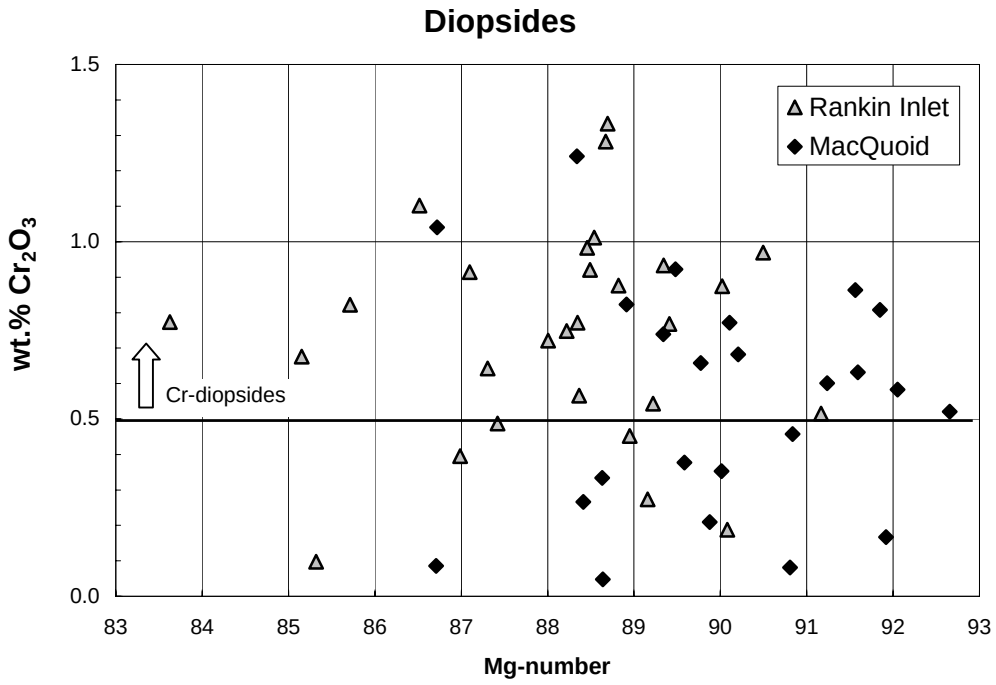

Fig. 26. Comparison of Cr_2O_3 versus Mg-number in diopsides from Rankin Inlet and MacQuoid Lake samples.

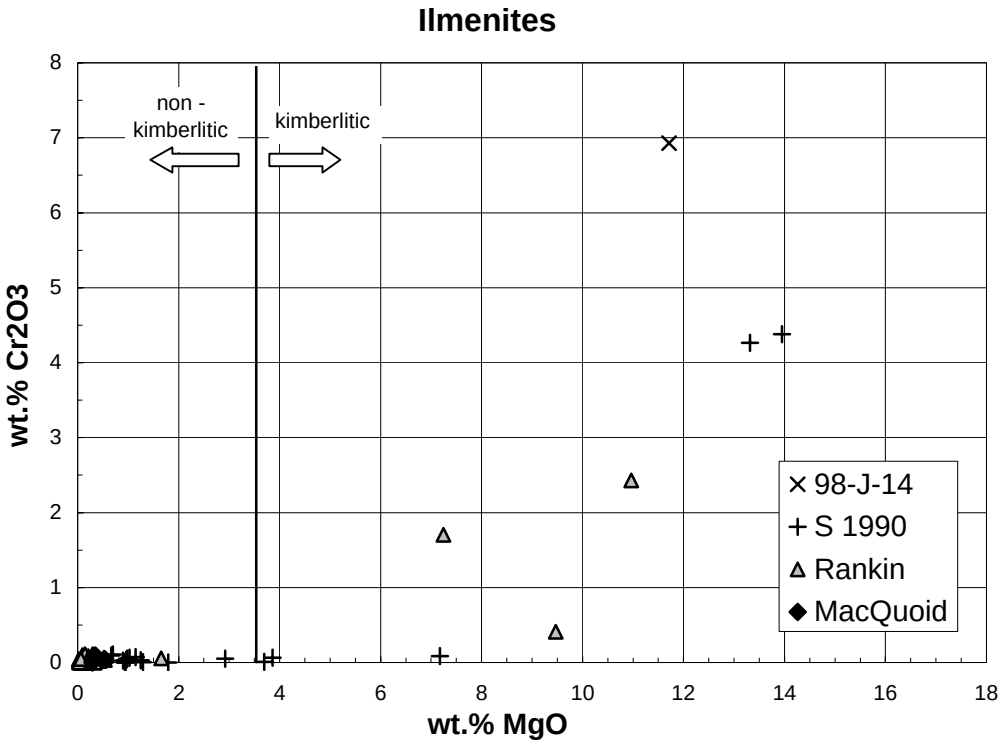

Fig. 27. Comparison of Cr_2O_3 versus MgO in ilmenites from Rankin Inlet and MacQuoid Lake samples, and from kimberlite samples. Vertical line at 3.5 wt.% MgO separates non-kimberlitic (crustal) from kimberlitic ilmenites.

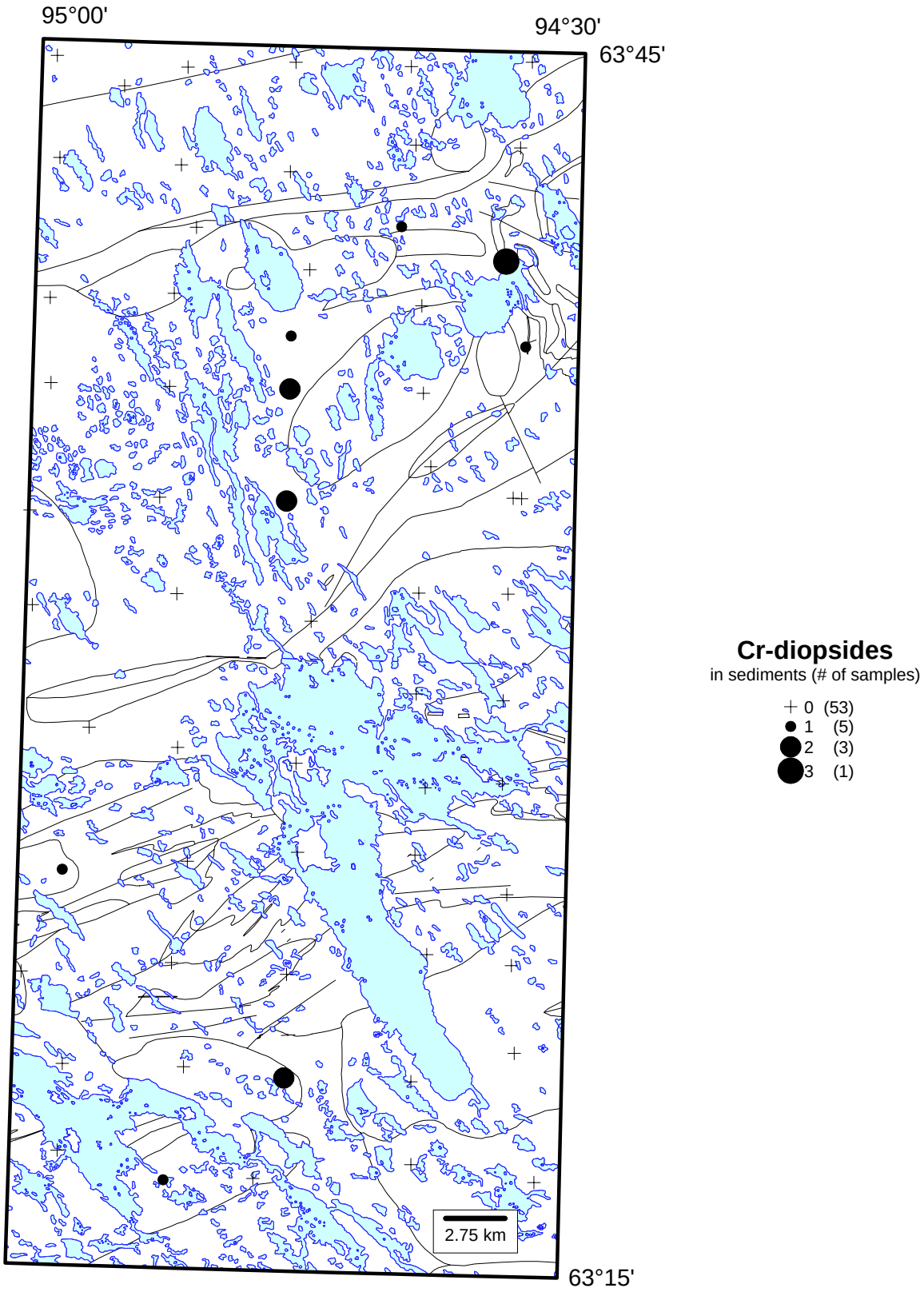

Figure 28. Cr-diopsides in MacQuoid Lake glacial sediments. Outline of geology is shown (i.e. Fig. 5).

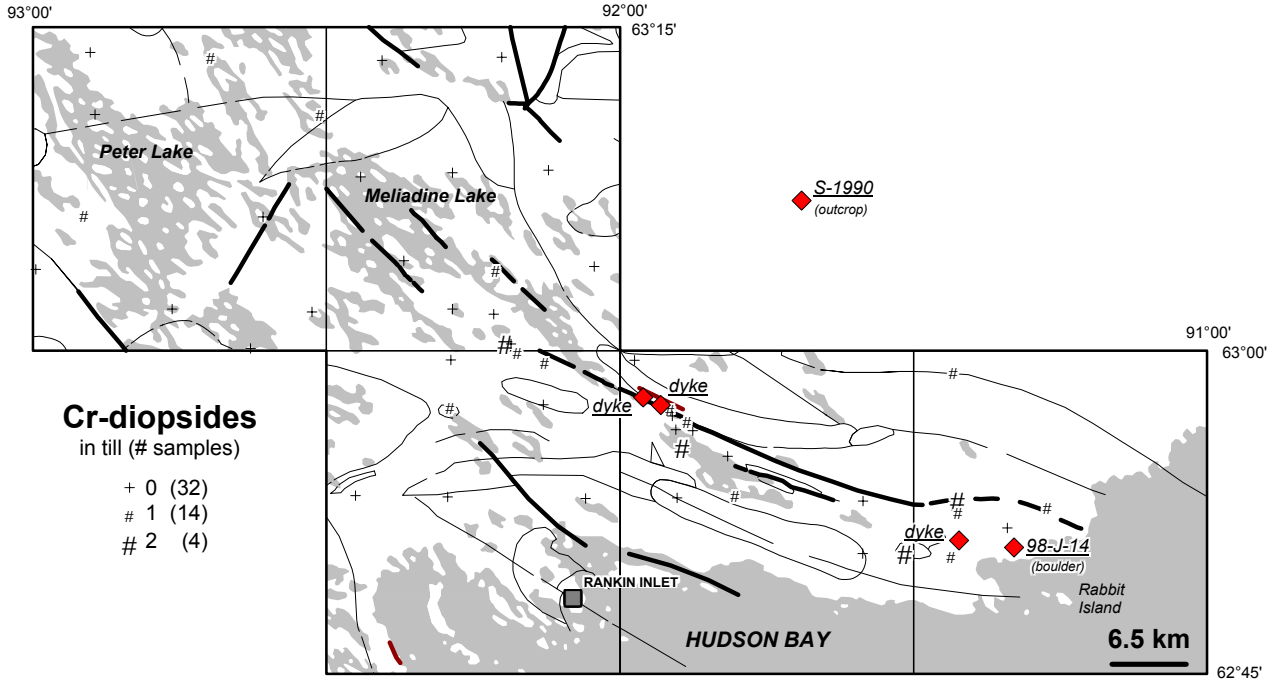

Figure 29. Cr-diopside grains in Rankin Inlet till samples. Outline of bedrock geology is shown (see figure 3).

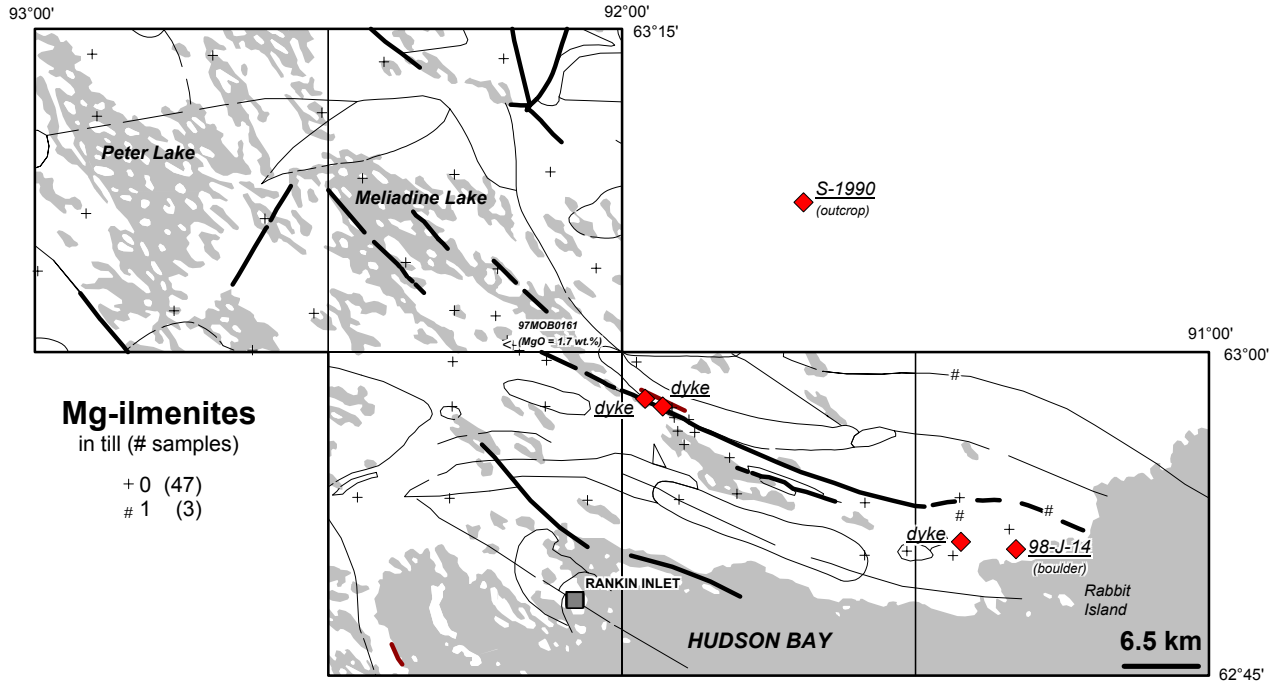

Figure 30. Mg-ilmenite grains in Rankin Inlet till samples. Outline of bedrock geology is shown (see figure 3).

with a kimberlite very poor in olivine and rich in calcite i.e. an evolved hypabyssal kimberlite. The Meliadine dykes studied by Seller (1999) have very similar (essentially identical) major and trace element geochemistry to the S-1990 and 98-J-14 samples of this report. The major difference is the samples of Seller (1999) are enriched in heavy rare earth elements (HREE).

Till geochemistry

Elements which have the greatest potential as kimberlite pathfinder elements in till can be determined by comparing the geochemistry of known kimberlite sources with that of the local bedrock (McClenaghan et al., 1999). Here, both regional and kimberlite geochemical data are limited and consequently, the discussion on till geochemical dispersal associated to kimberlites is constrained. A few patterns of high elemental abundances related to kimberlite dispersal in the Rankin Inlet area have been interpreted:

1) Till up-ice and down-ice from the eastern end of the Meliadine Trend in NTS 55J/13 and J/14 has elevated Co, Cr, Fe and Ni in the silt+clay-sized fraction (Fig. 31a). The area of elevated values trends SE, parallel to the main glacial transport direction and includes the location of kimberlite boulder 98-J-14. This area is also down-ice from the known kimberlite outcrop (S-1990) and contains an abundance of kimberlite indicator minerals in till. It is designated as the "Rabbit Island" dispersal train on Figure 32; and

2) Till down-ice from known kimberlite dykes near the Discovery Au showing has elevated Ni, TiO_2, MgO, K_2O, Co, Cr, Cs and rare earth elements in the silt+clay fraction (Fig. 31b). The distribution of kimberlite indicator minerals in the same area forms the "Discovery" dispersal train shown on Figure 32.

CONCLUSIONS

- Heavy mineral concentrates were recovered from 50 large bulk till samples in the Rankin Inlet area, 71 large bulk glacial sediment samples in the MacQuoid Lake area, and two hand-sized kimberlite rock samples from the Rankin Inlet area (98-J-14 and S-1990). A total of 449 kimberlite indicator minerals were confirmed after microprobe analysis, mainly from the two kimberlite samples (n=362). Rankin Inlet samples yielded 73 kimberlite indicator minerals and the MacQuoid Lake samples, 14.

- Kimberlite indicator minerals in the two hand-sized kimberlites from the Rankin Inlet area are olivine >> chromite >> Mg-ilmenite in sample 98-J-14, and chromite >> Mg-ilmenite in sample S-1990. The relative abundance of indicator minerals in the Rankin Inlet till samples is: eclogitic garnet > Cr-diopside > olivine > Mg-ilmenite > chromite > Cr-pyrope garnet. In the MacQuoid Lake samples, Cr-diopside constitutes the only potential kimberlite indicator mineral confirmed after microprobe analysis.

- Most of the kimberlite indicator minerals occur in the 0.25-0.5 mm size fraction of sediment and bedrock samples, except for olivine in kimberlite sample 98-J-14 which occurs equally in the 0.25-0.5 and 0.5-1 mm size fractions.

- From the 50 sites sampled in the Rankin Inlet area, 26 sites have at least one potential kimberlite indicator mineral and 10 sites have more than one type of indicator minerals.

- Based on the distribution of kimberlite indicator minerals, till geochemistry, and ice flow history, two glacial dispersal trains potentially associated with kimberlites are defined in the Rankin Inlet area (Fig. 32):
  1) The "Rabbit Island" dispersal train. The abundance and distribution of olivine, Mg-

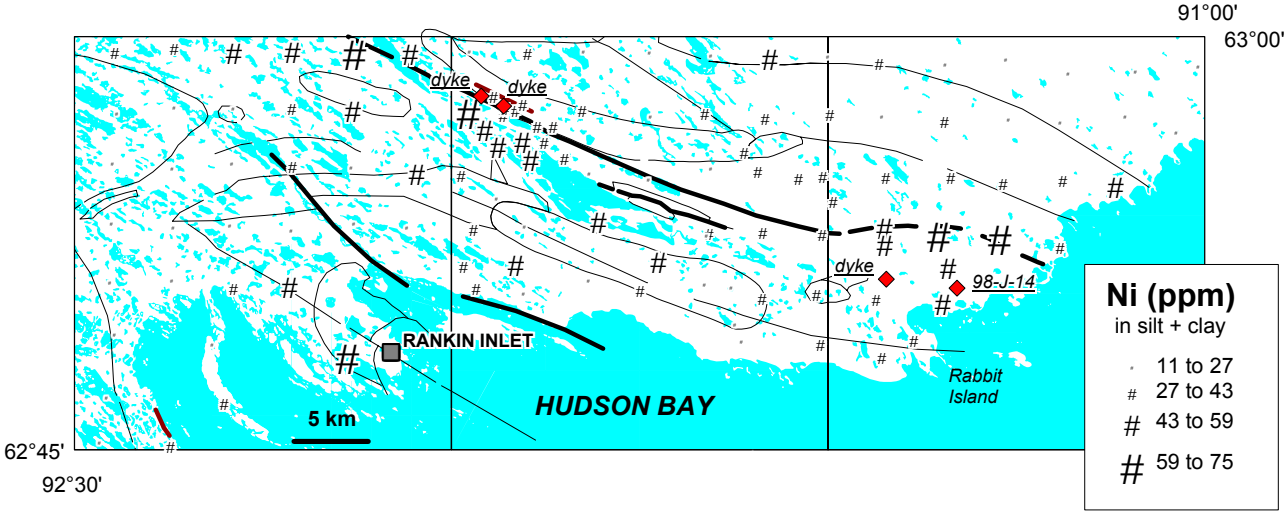

Figure 31a. Nickel in silt + clay fraction of till samples collected in the Rankin Inlet study area (55K/16, J/13 and J/14). Analysis is by ICP-MS, total dissolution. Outline of bedrock geology is shown (see Figure 3).

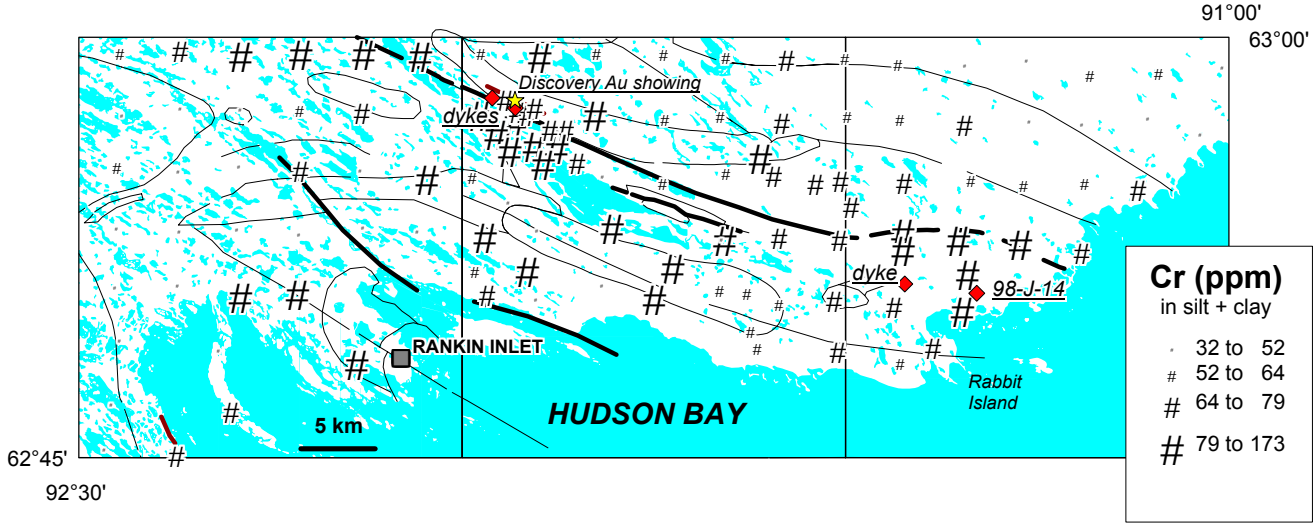

Figure 31b. Chromium in silt + clay fraction of till samples collected in the Rankin Inlet study area (55K/16, J/13 and J/14). Analysis is by ICP-MS, total dissolution. Outline of bedrock geology as well as Discovery Au showing are shown (see Figure 3).

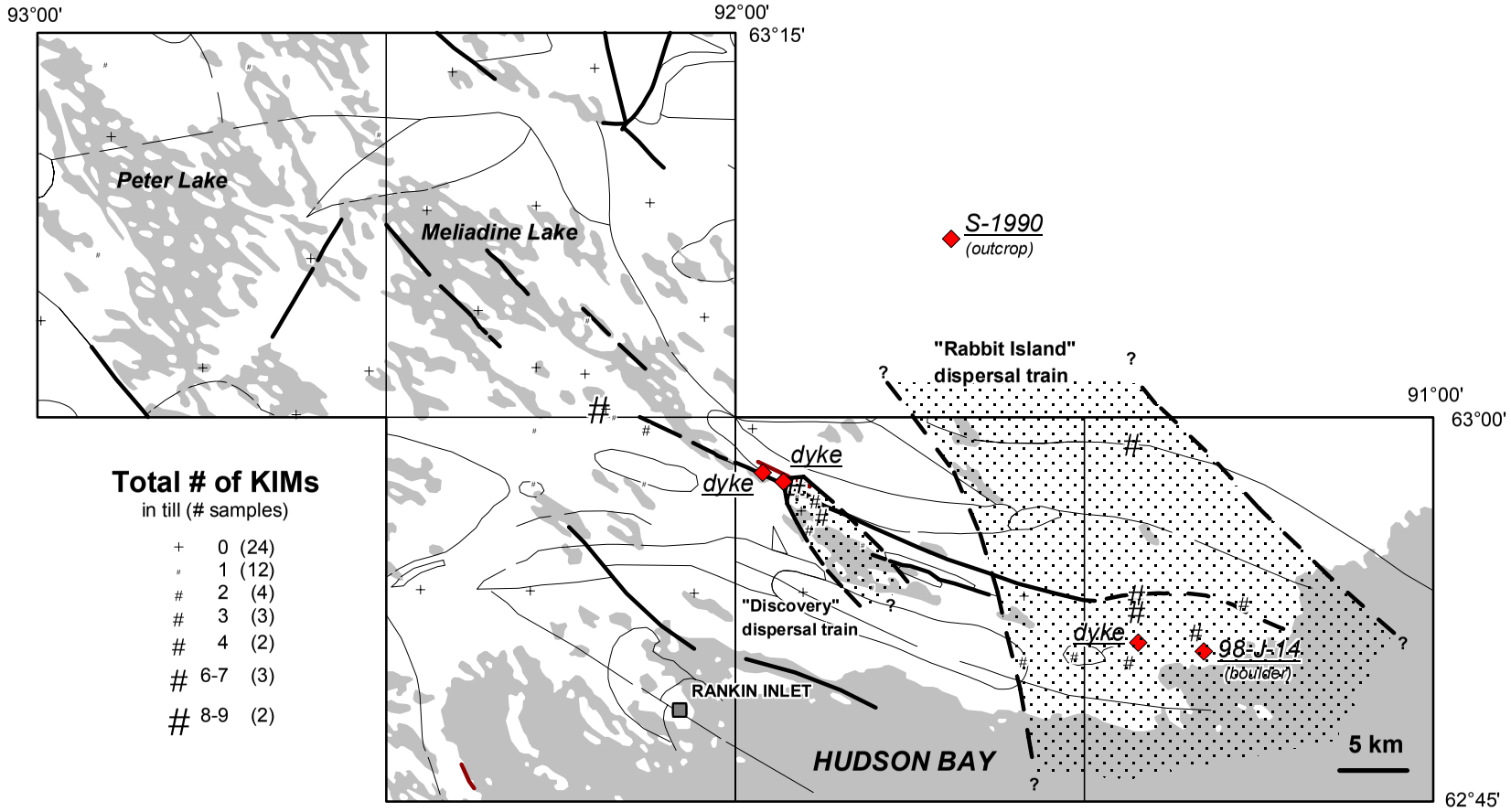

Figure 32. Total number of kimberlite indicator mineral (KIM) grain per till sample in the Rankin Inlet area. Approximate locations of "Rabbit Island" and "Discovery" dispersal trains are shown.

ilmenite, Cr-diopside, eclogitic garnet and Cr-pyrope garnet in till collected in NTS 55J/13 (east) and J/14 (west), in addition to elevated elemental concentrations in Co, Cr, Fe and Ni, suggest a southeastward glacial transport across this area from a kimberlite source located north of the study area in NTS 55 O/4 (S-1990), and/or from unknown kimberlitic sources located within or NW of the study area, which can be associated to the glacial dispersal of boulder size kimberlite debris (98-J-14).

2) The "Discovery" dispersal train. The greatest concentration of indicator minerals in the Rankin Inlet till samples (n=9) occurs at a site within this dispersal train. The abundance and distribution of eclogitic garnets and Cr-diopsides in this area suggests a southeastward glacial transport from an unknown kimberlite source near the Discovery Au showing in NTS 55 J/13. Kimberlite dykes have been intersected in drill core near the head of this train.

- Although chromite is abundant in both kimberlite bedrock samples, composition of the grains does not reflect the diamond inclusion chromite composition. Moreover, ilmenite composition generally indicates a low diamond potential for those two kimberlite samples.

- Eclogitic garnets having a potential diamond inclusion composition have been found at several sites in the Rankin Inlet area, which include the "Rabbit Island" and "Discovery" dispersal trains. Because these garnets overlap in composition with some crustal eclogite garnets from xenoliths in the Cross Lake shear zone, the Rankin Inlet eclogitic garnets may or may not be derived from kimberlite.

- In the MacQuoid Lake area, the only potential kimberlite indicator mineral (Cr-diopside) has a low Cr content (mainly < 1wt.% Cr_2O_3), suggesting they are derived from local or distal ultramafic sources, probably non-kimberlitic.

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Appendix A
Sample Locations and Descriptions

Appendix A.1 Kimberlite samples

Appendix A.2 Rankin Inlet till samples

Station ID Detailed description in McMartin (2000)

Class (till)

Class I: till collected from fresh mudboil with little oxidation, no organic cover and no marine shells

Class II: till collected from mudboil, showing some sign of oxidation (rotten clasts, Fe-Mn oxide staining); may contain discrete pieces of organic matter and a few broken shells

Texture

Visually determined in the field. For more quantitative analysis, refer to McMartin (2000)

Appendix A.3 MacQuoid Lake glacial sediment samples

Station No. Detailed description in Henderson (2000)

Quaternary unit Map polygon underlying sample site (from Aylsworth et al., 1981c)

Mn Nearshore sediments; generally well sorted sand, gravel, cobbles or boulders deposited as beaches, bars, spits, and ice-pushed ridges

AM Alluvium and marine sand or silt, undifferentiated

Tp Till plain

Ts Till plain; prominent striped pattern on airphotos

Tr Ribbed (Rögen) moraine; bouldery till forming hummocks and straight to sinuous ridges oriented perpendicular to ice flow; forms trains parallel to ice flow

Th Hummocky till; lacks significant boulder cover; occurs as hummocks

R/T Surface comprises 20 to 80% outcrop and is mantled with an average of <1m of till

Sediment Type

Till: diamicton, poorly sorted sediment, subrounded to angular clasts, fairly compact; deposited directly from glacial ice through lodgement or meltout processes

Diamicton: diamicton, poorly sorted sediment with angular to subrounded clasts, representing till slightly modified by glaciomarine processes; "reworked till"

Sand and/or Gravel (Glaciomarine): well sorted fine to medium sand with varying concentrations of pebbles, cobbles or boulders, representing nearshore glaciomarine sediment

Underlying Lithology bedrock lithology underlying sample site (from Tella et al, 1997b)

Q Quaternary; glacial, fluvial and marine deposits

Pgr Paleoproterozoic; granite, massive to weakly cleaved, pink-salmon, equigranular to porphrytic, may contain disseminated magnetite and fluorite

Agn Layered to banded hornblende-biotite orthogneiss; includes discontinuous layers of garnet and biotite, in part contains xenoliths of metamafic rocks

Ag K-feldspar, augen granite; in part characterized by quartz-ribbon mylonite.

Agq Quartz diorite to granite plutons; grey to pale pink, massive to weakly foliated centres, and well foliated migmatic margins; abundant paragneiss and amphobolite bands/layers at the margins (agmatitic); locally contain fine-grained disseminated magnetit

As Metasedimentary rocks: garnet and biotite, +/- staurolite, +/- andalusite, +/- kyanite, +/-sillimanite, +/- cordlerite, +/- muscovite paragneiss; metamorphosed quartz-magnetite banded iron formations, migmatite, diatexite.

Av Basalt to andesite, massive to pillowed flows, pillw breccia; for the most part metamorphosed to hornblends and garnet-chlorite schists and amohibolite

Afv Intermediate to felsic flows, lapilli tuffs, pyroclastics and minor gabbro sills.

Appendix A.1
Kimberlite Sample Description

SAMPLE ID: S-1990

Hand samples: Consist of fist size blocks with minor surface weathering. A few pieces appear to have a preferred alignment of mica crystals. The relative proportions of olivine is quite variable between samples. These features are typical of flow differentiation as observed in magmatic dyke rocks. The texture of the sample is not porphryritic, as is typical for kimberlite; the sample is relatively fine grained (aphanitic). The largest crystals observed in the hand samples consist of highly altered olivine (to 2 mm), which are common, but not abundant, plus mica (generally less than 0.5 mm). No apparent phlogopite macrocrysts, or megacryst suite minerals typical of kimberlite (e.g. Ti-Cr garnet, ilmenite) were observed. The sample reacts with dilute HCl, indicating the presence of calcite in the groundmass. No obvious pelletal or juvenile lapilli were observed.

Interpretation: A hypabyssal facies rock, relatively fine grained, non-porphyritic.

Petrography: Polished thin sections were prepared from three samples selected to encompass the major grain size and mineralogical variations in the sample suite. Samples were examined by transmitted light microscopy and by scanning electron microscopy (SEM).

Olivine, completely altered to serpentine, is a common constituent, and the only apparent 'phenocryst'. Olivine macrocrysts (0.5 - 10 mm) are rare. The largest olivine crystals are about 2mm, anhedral to subhedral in habit, and very rare. Most olivine crystals are 0.5 - 1.5 mm in size, with the majority less than 0.8 mm and are subhedral to euhedral in habit. Sample B contains the most olivine (tending to microporphyritic), sample C the least (aphanitic), and sample A intermediate between these two (aphanitic).

The groundmass consists of the following phases: calcite, serpentine, atoll spinels, phlogopite, perovskite and apatite. The groundmass is dominated by calcite and serpentine, with lesser abundances of spinel, phlogopite, perovskite and apatite. The relative proportions of these phases and also the textures varies in the three samples. Sample C is oxide-rich. Sample B is apatite-rich, and also contains poikilitic phlogopite mica and rare kimberlite autoliths (to 2 mm). Phlogopite mica is zoned from pale brown cores to colorless rims, the latter indicating the rims consist of Ba-phlogopite/kinoshitalite solid solutions. Rare ilmenite cores are observed to be overgrown by spinel.

Interpretation: The mineral assemblage, and the textural relations observed are consistent with those typical of hypabyssal facies kimberlite.

Mineral chemistry: The chemical zoning trends of spinel and phlogopite can be utilized to successfully discriminate kimberlites from other rock types (e.g. Mitchell, 1986, 1995).

EDS spectra for a typical zoned phlogopite (core and rim analyses) from sample S-1990-B indicate that the core to rim zoning trend shows increasing Al, Ba, Mg and decreasing K, Si, Ti and Fe i.e. Ba-phlogopite cores zoned to rims with increased kinoshitalite solid solution (and higher Mg-number). Similar core to rim zoning is also seen in the eight electron microprobe analyses (four core and four rim) provided to the author by Saminex. This phlogopite zoning trend is characteristic of kimberlite.

Spinel analyses (based on heavy mineral concentrate - this report) are dominated by titanian magnesian aluminous chromite (TIMAC). These compositions are typical of the least evolved spinels from spinel trend 1, which is diagnostic of kimberlite. Examination of groundmass spinels in polished thin sections by back scattered electron imaging coupled with EDS indicate these spinels are rich in FeO_{total}, MgO and TiO_2 i.e. they contain significant proportions of the magnesian ulvöspinel end-member, typical of kimberlites. All the groundmass spinels (<0.15mm) are magnesian ulvöspinel - ulvöspinel - magnetite (MUM) series spinels. Rarely, larger (to 3mm) spinels are observed in polished thin sections. These spinels are zoned and have TIMAC cores and MUM rims. Core and rim EDS spectra for this type of spinel from sample S-1990-C indicate decreasing Cr with increasing Fe_{total} and Ti at constant Al. Compositions of spinel in sample S-1990 are typical of kimberlites i.e. they are from magmatic trend 1. This is also supported by concentrate data, in which there are evolved Ti-rich spinels.

Interpretation: Compositional zoning trends observed in phlogopite (Ba-phlogopite - Ba-phlogopite/$kinoshitalite_{ss}$) and spinel (magmatic trend 1) indicate the samples examined are bonafide Group 1 or archetypical kimberlites.

Geochemistry: Whole-rock major and trace element geochemistry was performed at XRAL and provided to the author by Saminex. The geochemistry is relatively typical for a kimberlite i.e. low Si, Al and high Mg, volatiles, Sr, Ba, Nb, Zr, La/Yb_n. However, it is somewhat unusual in that compared to many kimberlites, MgO is low (<20 wt%), and CaO and P_2O_5 are relatively high. These elemental abundances indicate that this kimberlite is very poor in olivine and rich in calcite i.e. it is an evolved hypabyssal kimberlite.

Interpretation: Low compatible (olivine) element and high incompatible element signature consistent with an evolved hypabyssal kimberlite.

SYNOPSIS: Sample S-1990 is an aphanitic hypabyssal calcite serpentine kimberlite. There is a fair degree of variation in the relative proportions of the minerals present, i.e. olivine, spinel, apatite such that some of the samples examined are better termed aphanitic hypabyssal oxide calcite kimberlite.

SAMPLE ID: 98-J-14

Hand samples: Blocks with minor surface weathering (consistent with sample being float-derived); some limited textural variations between submitted samples. The gross texture of all the samples is porphryritic, which is typical for kimberlite. The relative proportions of olivine (or serpentinized equivalent) and the olivine grain size is quite variable between samples. Very large olivine crystals (to 7 mm) are rare or uncommon; in general euhedral to subhedral 1 - 2 mm olivine crystals are the dominant phenocryst phase in this rock. Rare phlogopite phenocryst also observed (generally less than 0.5 mm). The sample reacts with dilute HCl, suggesting calcite in the groundmass. The groundmass is extremely fine grained and not resolvable. No obvious pelletal or juvenile lapilli were observed.

Interpretation: A porphyritic olivine-bearing hypabyssal facies rock.

Petrography: Polished thin sections were prepared from two samples (new) and examined with the thin sections submitted by Saminex. Samples were examined by transmitted light microscopy and briefly by scanning electron microscopy (SEM).

Olivine (variably altered to serpentine) is a common constituent. Rounded olivine macrocrysts (3 - 7 mm) are rare to poorly abundant. Cores of these crystals contain relict olivine, with the rims altered to serpentine. Euhedral to subhedral olivine crystals (1 - 2 mm in size) are the dominant phenocryst phase. These crystals are usually completely serpentinized and, only rarely, are relict olivine cores observed. Phlogopite - Ba-phlogopite microphenocrysts (< 1 mm) are of variable abundance. Phlogopite mica with oscillatory and normal zoning was observed. These micas exhibit pale brown cores (and rims), with colourless medial zones (and/or rims); the latter indicating Ba-phlogopite/kinoshitalite solid solution composition mica.

The groundmass consists of the following phases: monticellite, calcite, serpentine, spinel, Ba-phlogopite, perovskite and apatite. The groundmass is dominated by sub-equal monticellite, calcite and serpentine, with lesser abundances of spinel, phlogopite, perovskite and apatite. The relative proportions of the groundmass phases and also their textures varies. Hence some samples have a monticellite dominated groundmass, while in others the groundmass is quite oxide (spinel)-rich.

Interpretation: The mineral assemblage observed, and the textural relations observed are consistent with those typical of hypabyssal facies kimberlite. The occurrence of 'atoll spinels' in the groundmass is also characteristic of kimberlite.

Mineral chemistry: Semi-quantitative ED spectra were collected from an oscillatory zoned phlogopite. The core and rim are similar in composition, with higher Al, K, Si, Fe and lower Ba, Mg than the intermediate zone of the crystal. The medial zone of the phlogopite has increased kinoshitalite solid solution (and higher Mg-number). The mineral chemistry of the phlogopite/Ba-phlogopite examined is

typical of kimberlite. Although oscillatory zoned groundmass phlogopite in kimberlite is not common, it is reported in kimberlites from Guinea and China (Mitchell, 1995).

ED spectra collected on groundmass monticellite indicate that it is Mg-rich. These crystals appear to be homogenous in composition.

Examination of groundmass spinels in polished thin sections by back scattered electron imaging coupled with EDS indicate these spinels are rich in FeO_{total}, MgO and TiO_2 i.e. they contain significant proportions of the magnesian ulvöspinel end-member, typical of kimberlites. All the groundmass spinels (<0.15mm) are magnesian ulvöspinel - ulvöspinel - magnetite (MUM) series spinels. Compositions of the spinel in sample 98-J-14 are typical of kimberlite.

Interpretation: Mineral chemistry, and compositional zoning trends observed in phlogopite (Ba-phlogopite - Ba-phlogopite/kinoshitalite$_{ss}$), spinel and monticellite, coupled with the observed groundmass mineral assemblage indicate the samples examined are bonafide Group 1 or archetypal kimberlite.

Geochemistry: Whole-rock major and trace element geochemistry was performed at the Saskatchewan Research Council and provided to the author by Saminex. Major element analysis by ICP (fusion); trace element analysis by multi-acid digestion ICP. The geochemistry is quite typical for a kimberlite i.e. low Si, Al and high Mg, volatiles, Sr, Ba, Nb, Zr, La/Yb_n.

Interpretation: The 98-J-14 sample appears to have a geochemical signature (major and trace element) typical of kimberlite.

SYNOPSIS: Sample 98-J-14 is a hypabyssal facies monticellite kimberlite. Variation in the relative proportions of the groundmass minerals suggests that some of the samples examined are better termed hypabyssal facies monticellite oxide kimberlite.

Appendix A.2
Till Sample Location and Description
Rankin Inlet area

SAMPLE ID	Station ID	Easting	Northing	UTM Zone	NTS sheet	Depth (cm)	Description	Class (till)	Munsell colour (wet)	Munsell code	Texture
97MOB0097	MOB970201	554374	6981238	15	55J/13	35	till	I	olive brown	2.5Y 4/4	sandy
97MOB0106	MOB970210	555057	6981065	15	55J/13	25	till	II	greyish brown	2.5Y 5/2	sandy
97MOB0107	MOB970211	555251	6980224	15	55J/13	36	till	I	brown	10YR 4/3	sandy
97MOB0123	MOB970242	580085	6973845	15	55J/14	25	till	II	olive	5Y 5/3	sandy
97MOB0127	MOB970250	555566	6979063	15	55J/13	33	till	I	light olive brown	2.5Y 5/3	sandy
97MOB0132	MOB970254	557039	6978991	15	55J/13	25	till	I	greyish brown	2.5Y 5/2	sandy
97MOB0138	MOB970260	556543	6980067	15	55J/13	35	till	II	brown	10YR 5/3	sandy gravel
97MOB0161	MOB970341	540744	6986665	15	55N/1	36	till	I	light olive brown	2.5Y 5/3	sandy
97MOB0164	MOB970344	541244	6986239	15	55N/1	40	till	I	olive	5Y 5/3	sandy
97MOB0166	MOB970346	541807	6985800	15	55N/1	25	till	II	olive grey	5Y 5/2	sandy
98MOB0008	MOB980023	580138	6972678	15	55J/14	45	till	I	olive	5Y 5/3	sandy
98MOB0011	MOB980029	584462	6971204	15	55J/14	30	till	II	olive	5Y 5/3	sandy
98MOB0024	MOB980044	556147	6977923	15	55J/13	30	till	I	light olive brown	2.5Y 5/3	sandy
98MOB0061	MOB980094	579476	6984781	15	55J/14	30	till	I	olive grey	5Y 5/2	sandy
98MOB0072	MOB980105	587882	6973323	15	55J/14	40	till	I	olive	5Y 5/3	sandy
98MOB0074	MOB980108	579638	6968840	15	55J/14	40	till	I	greyish brown	2.5Y 5/2	sandy
98MOB0075	MOB980109	575627	6969116	15	55J/13	35	till	I	greyish brown	2.5Y 5/2	sandy
98MOB0077	MOB980111	571958	6968693	15	55J/13	40	till	I	greyish brown	2.5Y 5/2	sandy
98MOB0099	MOB980140	511989	6988984	15	55N/2	35	till	II	olive brown	2.5Y 4/4	sandy pebble
98MOB0114	MOB980173	571887	6973212	15	55J/13	40	till	II	olive	5Y 5/3	sandy
98MOB0128	MOB980188	560092	6976843	15	55J/13	25	till	I	light brownish grey	2.5Y 6/2	sandy
98MOB0129	MOB980189	560784	6973761	15	55J/13	45	till	I	light olive brown	2.5Y 5/3	sandy silt
98MOB0131	MOB980193	555794	6973176	15	55J/13	30	till	I	greyish brown	10YR 5/2	sandy
98MOB0133	MOB980195	547857	6972989	15	55K/16	35	till	II	light olive brown	2.5Y 5/3	sandy
98MOB0135	MOB980197	535905	6972991	15	55K/16	35	till	I	light brownish grey	10YR 6/2	sandy
98MOB0137	MOB980199	527924	6973006	15	55K/16	20	till	I	light brownish grey	10YR 6/2	sandy
98MOB0146	MOB980208	551904	6984968	15	55J/13	30	till	I	light brownish grey	2.5Y 6/2	sandy
98MOB0148	MOB980210	544163	6984978	15	55K/16	35	till	II	olive	5Y 5/3	sandy
98MOB0150	MOB980212	536058	6984785	15	55K/16	35	till	I	light olive brown	2.5Y 5/3	sandy pebble
98MOB0155	MOB980217	536044	6980916	15	55K/16	30	till	I	light brownish grey	10YR 6/2	sandy
98MOB0157	MOB980219	544104	6981015	15	55K/16	30	till	II	olive	5Y 5/3	sandy
98MOB0160	MOB980222	539711	6988759	15	55N/1	35	till	I	olive brown	2.5Y 4/3	sandy
98MOB0161	MOB980223	536149	6989181	15	55N/1	35	till	II	olive	5Y 5/3	sandy
98MOB0165	MOB980227	531920	6993285	15	55N/1	30	till	I	greyish brown	2.5Y 5/2	sandy
98MOB0167	MOB980229	539844	6992815	15	55N/1	35	till	II	light olive brown	2.5Y 5/3	sandy
98MOB0169	MOB980231	548308	6992992	15	55N/1	30	till	I	greyish brown	2.5Y 5/2	sandy
98MOB0176	MOB980238	528152	7000492	15	55N/1	40	till	II	brown	10YR 5/3	sandy
98MOB0178	MOB980240	536019	7000911	15	55N/1	35	till	I	olive grey	5Y 5/2	sandy
98MOB0180	MOB980242	544250	7001230	15	55N/1	30	till	I	olive grey	5Y 5/2	sandy
98MOB0184	MOB980250	529894	7010537	15	55N/1	35	till	I	grey	5Y 6/1	sandy clay
98MOB0186	MOB980252	540124	7010926	15	55N/1	30	till	I	olive grey	5Y 5/2	sandy pebble
98MOB0188	MOB980271	504900	7011083	15	55N/2	35	till	I	greyish brown	10YR 5/2	sandy clay
98MOB0190	MOB980273	515231	7010991	15	55N/2	40	till	II	greyish brown	2.5Y 5/2	sandy
98MOB0193	MOB980276	524607	7006128	15	55N/2	35	till	II	greyish brown	2.5Y 5/2	sandy
98MOB0198	MOB980281	505313	7005729	15	55N/2	35	till	II	light olive brown	2.5Y 5/3	sandy
98MOB0203	MOB980286	504388	6997340	15	55N/2	35	till	I	light brownish grey	2.5Y 6/2	sandy clay
98MOB0205	MOB980289	500253	6992385	15	55N/2	45	till	I	light brownish grey	10YR 6/2	sandy
98MOB0210	MOB980295	519769	6996964	15	55N/2	35	till	I	light brownish grey	10YR 6/2	sandy
98MOB0213	MOB980298	524036	6988822	15	55N/2	40	till	I	light olive brown	2.5Y 5/3	sandy
98MOB0217	MOB980302	518769	6985630	15	55N/2	40	till	I	light brownish grey	2.5Y 6/2	sandy pebble

Appendix A.2
Till Sample Location and Description
Rankin Inlet area

SAMPLE ID	Comments
97MOB0097	relatively active mudboil; weakly calcareous, very hard; pebble lag on surface, some Dubawnt, mainly local clasts
97MOB0106	grey to orange (oxidized), compact, non calcareous
97MOB0107	small active mudboil; brown, non calcareous
97MOB0123	clast rich mudboil cover; olive, slightly oxidized, few shells
97MOB0127	olive brown, non calcareous; angular greywacke clasts dominant
97MOB0132	grey brown, non calcareous; lots of shingle clasts
97MOB0138	brown, non calcareous, gravel layer at bottom
97MOB0161	brown, non calcareous, no shells; lots of angular clasts, mainly metaseds and metavolcanics
97MOB0164	flat mudboil with calc. prec. layer on top; non calcareous, a bit of organic matter
97MOB0166	olive, non calcareous, few shells; locally derived angular clasts
98MOB0008	non calcareous, sandy, high clast content, compact, organic matter and silty/sandy lens at bottom; many angular local clasts, few Dubawnt
98MOB0011	fresh mudboil; non calcareous, oxidized with some strings of reduced till; clasts are sub-angular; no Dubawnt clasts
98MOB0024	fresh mudboil with lots of clasts; non calcareous, sandy/pebbly till; some granitoids, rounded and locally derived angular metasediments
98MOB0061	non calcareous, pebbly, slightly oxidized, with some roots; fair amount of granitoids and some amphibolite
98MOB0072	non-calcareous, slightly oxidized; many locally derived greywacke clasts, rare Dubawnts and granitoids
98MOB0074	non calcareous, loose; few Dubawnts and mainly metasediments
98MOB0075	fresh mudboil; non calcareous, fairly loose; rare Dubawnt, dominant sheared metasediments
98MOB0077	fresh mudboil; non calcareous; lots of small Dubawnt and granitoids, and local clasts
98MOB0099	oxidized, rusty color (derived from sulphides ?), high bouyancy; clasts sub-angular, lots of metaseds, lg sulphide boulder nearby
98MOB0114	non calcareous, a few roots so slightly oxidized; few Dubawnts, mainly angular metasediments and amphibolites
98MOB0128	good fresh mudboil; non calcareous; lots of local chips of metasediments, few Dubawnts and some granitoids
98MOB0129	non calcareous, relatively clast poor; mainly angular meatsediments, rare Dubawnts
98MOB0131	non calcareous, slightly oxidized; few Dubawnt clasts, mainly metasediments
98MOB0133	slightly calcareous, very few pieces of shells, no shells on surface; some Dubawnts but mainly angular metasediments
98MOB0135	non calcareous, lots of small clasts; some to few Dubawnts, dark grey clasts and some granitoids present
98MOB0137	non calcareous, compact; fair amount of Dubawnts and lots of tonalites
98MOB0146	non calcareous, compact; lots of angular metasediments and some Dubawnt
98MOB0148	calcareous, few broken shells but some incorporation of shells that are mostly leached down; local angular clasts, some Dubawnt
98MOB0150	non calcareous; lots of angular chips of local bedrock, rare Dubawnt
98MOB0155	good mudboil; non calcareous; lots of locally derived clasts, mainly metasediments and metavolcanics, several Dubawnt
98MOB0157	non calcareous, some oxidation and roots; lots of locally derived clasts
98MOB0160	non calcareous; lots of metasediments, few Dubawnts
98MOB0161	non calcareous, some organic matter incorporation; mainly locally derived angular clasts
98MOB0165	non calcareous; lots of meta-rocks, some granitoids and Dubawnts
98MOB0167	non calcareous, some organic matter/oxidized; metasedimentary clasts are abundant
98MOB0169	non calcareous; several granitoids, rare Dubawnts
98MOB0176	non calcareous, loose, some oxidation; lots of granitoids and Dubawnts
98MOB0178	non calcareous; lots of ganitoids, rare Dubawnts
98MOB0180	non calcareous, very pebbly; lots of tonalite clasts, rare Dubawnts
98MOB0184	non calcareous; clasts almost all sub-angular granitoids, mix of pink, grey, black intrusives, rare Dubawnts
98MOB0186	non calcareous, somewhat oxidized; all granitoids, no Dubawnts seen
98MOB0188	"reddish" till; numerous Dubawnts, granitoids and "amphibolite" clasts
98MOB0190	some sand lens - oxidized, some roots; granitoids and Dubawnts, lots of dark - non greestone boulder clasts
98MOB0193	lots of roots; "salt-and-pepper", no "greenstone" clasts except amphibolite, some Dubawnts
98MOB0198	non calcareous, some oxidation strings and organic matter; seems to be greenstone belt clasts, few Dubawnts
98MOB0203	non calcareous, lots of clasts; mainly granitoids/tonalites, some Dubawnts and some greenstone clasts
98MOB0205	non calcareous, gravelly in places; lots of granitoids and several Dubawnt clasts
98MOB0210	non calcareous, compact; several Dubawnts, good mix of granitoids and greenstone clasts (or dark)
98MOB0213	non calcareous; several Dubawnts and angular local clasts (greenstone), several granitoids
98MOB0217	non calcareous; many angular metasediments, some Dubawnts and granitoids

Appendix A.3
Sediment Sample Location and Description
MacQuoid Lake area

Station No.	Sample No.	NTS	UTM			Quaternary Unit	Texture	Sediment Type	Depth (cm)	Munsell Colour		Underlying Lithology	Field Observations/Comments
			Zone	Easting	Northing					Colour	Description		
98HJB0115	98HJB0010	55M	15	405002	7068362	Tp	silty	Till	45	7.5YR 5/4	Brown	Ag	Composite sample (2): brown and red-brown diamicton
98HJB0116	98HJB0011	55M	15	408274	7061924	Ts	sandy	Till	40	7.5YR 6/3	Light brown	Av	Very sandy in places
98HJB0142	98HJB0012	55M	15	418053	7069234	Tp (R/T)	sandy	Till	45	7.5YR 5/3	brown	Ag	Pebbly surface, clasts angular, some Dubawnt
98STP0001	98HJB0013	55M	15	423559	7069436	Tp	silty	Till	50	7.5YR 5/3	Brown	Ag	Few small clasts, subangular, some Dubawnt present
98HJB0143	98HJB0014	55M	15	418270	7040694	Tp	sandy	Till	55	7.5YR 5/3	brown	Q	Clasts angular, moderately stoney
98STP0002	98HJB0015	55M	15	422226	7040388	Tp	sandy	Sand	45	7.5YR 6/3	Light brown	Agq	Mudboil poorly developed, covered w/ vegetation, subrounded clasts.
98HJB0144	98HJB0016	55M	15	418257	7065661	Tp	gravel?	Sandy gravel	45	5YR 3/3	dark reddish brown	Ag	Clasts angular, stoney
98STP0003	98HJB0017	55M	15	423023	7065533	Tp (R/T)	sandy	Till	50	10YR 5/3	Brown	Afv	Fairly dry till adjacent to outcrop
98HJB0145	98HJB0018	55M	15	418679	7036423	Tp	sandy	Diamicton	30	10YR 5/3	Brown w/ organic	Q	Beach deposit, poor sample
98STP0004	98HJB0019	55M	15	422200	7036604	Tp	sandy	Till	50	5YR 5/3	Reddish brown	As	Fresh mudboil w/pebbles on top, Dubawnt present.
98HJB0146	98HJB0020	55M	15	417607	7061945	R/T (Tp)	sandy	Till	55	5YR 4/3	Reddish brown	Afv	Good till, some organic material on one side of sample hole
98STP0005	98HJB0021	55M	15	422371	7060367	Tp	sandy	Till	50	7.5YR 5/3	Brown	Afv	Roots throughout . Near small outcrop
98HJB0147	98HJB0022	55M	15	418217	7033360	R/T	sandy	Till	30-50	7.5YR 5/3	Brown	Agq	Pebbles subangular to subrounded,
98STP0006	98HJB0023	55M	15	422398	7031563	Tp	sandy	Diamicton	45	7.5 YR 4/3	Brown	As	Mudboil located in felsenmeer, not very fresh. Few pebbles.
98HJB0148	98HJB0024	55M	15	418531	7058354	Tp (near esker)	sandy	Till	40-50	5YR 4/3	Reddish brown	Av	Very wet till, few boulders in hole; one rounded most angular
98STP0007	98HJB0025	55M	15	423257	7056482	R/T	sandy	Till	35	7.5YR 5/3	Brown	Q/Av	Sample saturated w/ water; clasts small. Hole collapsing
98HJB0149	98HJB0026	55M	15	418755	7028843	Tp	sandy	Till	45	5YR 5/3	Reddish brown	Agq	
98STP0008	98HJB0027	55M	15	422606	7028339	Tr (Th)	sandy	Till	50	7.5YR 5/3	Brown	Q	Clasts subangular. Near beach.
98STP0009	98HJB0029	55M	15	422681	7049594	R/T	sandy	Till	50	5YR 5/3	Reddish brown	Agq	Area covered by swamp or felsenmeer. Few pebbles/gravel in till.
98HJB0150	98HJB0030	55M	15	418598	7054366	Tp	sandy	Till	40-50	5YR 5/4	Reddish brown	Ag	Large boulder at base
98STP0010	98HJB0031	55M	15	413491	7043997	Tp	sandy	Till	55	7.5YR 6/4	Light brown	Av	Clasts subrounded; some roots in till. Top of mudboil covered by pebbles to cobbles.
98HJB0151	98HJB0032	55M	15	412809	7069433	Tp	sandy	Till	45-55	7.5YR 6/3	Light brown	Ag	Wet near base of hole, clasts subrounded, boulder on surface
98STP0011	98HJB0033	55M	15	407376	7045260	Tp	silty	Till	50	7.5YR 5/3	Brown	Q	Swampy area. Till contains pebble size clasts or smaller
98HJB0152	98HJB0034	55M	15	407894	7069212	Tp	sandy	Till	45-50	7.5YR 5/4	Brown	Ag	
98STP0012	98HJB0035	55M	15	400803	7044763	Tp	silty	Till	60	2.5YR 5/3	Reddish brown	Pgr	Few clasts near the top of hole; increasing in size and number near base. Sticky till
98HJB0153	98HJB0036	55M	15	401945	7069741	Ts	sandy	Till	45-50	7.5YR 5/3	Brown	Ag	Clasts angular, few cobbles present in hole.
98STP0013	98HJB0037	55M	15	403385	7039189	Tp	silty-sand	Till	45	5YR 6/3	Light reddish brown	Q	Swampy area, few mudboils. Pebbles to cobbles on surface. Brown w/ red brown inclusio
98HJB0154	98HJB0038	55M	15	402061	7065104	Tp	silty	Till	45-55	10YR 5/3	Brown	Ag	Surface cobbles generally angular-subrounded
98STP0014	98HJB0039	55M	15	407417	7038265	Tp (Th)	sandy	Till	35-40	5YR 5/4	Reddish brown	Q	Flat area near lakeshore; numerous clasts increasing in size with depth.
98HJB0155	98HJB0040	55M	15	407593	7064767	Tp	sandy	Till	45-55	7.5YR5/3	Brown	Ag	Red till towards base of hole, Mudboil w/ angular clasts
98STP0015	98HJB0041	55M	15	412809	7037548	Tp	sandy	Till	45-50	5YR 5/4	Reddish brown	Q	Dry sediment. Gravel clasts.
98HJB0156	98HJB0042	55M	15	412548	7064445	Ts	silty-sandy	Till	50-60	7.5YR5/3	Brown	Ag	Irregular pocket of silty bright red brown till
98STP0016	98HJB0043	55M	15	412869	7033494	Th	sandy	Diamicton	40-45	7.5YR 5/3	Brown	Q	Numerous pebbles in till, number increasing w/ depth.
98HJB0157	98HJB0044	55M	15	413437	7059994	Tp	sandy	Till	45	7.5YR6/4	Light Brown	Q	Few small clasts on surface, inclusion of red diamiction
98STP0017	98HJB0045	55M	15	407860	7033090	Tp	sandy	Diamicton	50	5YR 6/3	Light reddish brown	Agq	Flat swampy area near lake. Percentage of clasts increasing w/ depth, subrounded
98HJB0158	98HJB0046	55M	15	407267	7058927	Tp	silty	Till	40-50	5YR 4/2	Dark reddish gray	Agq	Clasts angular-subrounded
98STP0018	98HJB0047	55M	15	402168	7032719	Tp	sandy-silty	Till	50	2.5YR 5/3	Reddish brown	Av	Several mudboils surrounded by swamp. Cobbles in till.
98HJB0159	98HJB0048	55M	15	401619	7058736	Tp	silty	Till	40-50	2.5YR 5/4	Reddish brown	Q	Many cobbles rounded to subrounded
98STP0019	98HJB0049	55M	15	400291	7028089	Tp (near esker)	sandy	Till	60	2.5YR 5/4	Reddish brown	Q	Beach nearby. Roots; sand w/ gravel and pebbles near base of pit
98HJB0160	98HJB0050	55M	15	401654	7054861	Tp	silty	Till	40-55	2.5YR 5/3	Reddish brown	Q	Clasts rounded to subrounded, sticky homogeneous
98STP0020	98HJB0051	55M	15	412373	7027945	Tp	silty	Till	50	5YR 5/3	Reddish brown	Agq/As	Brown till w/ red till inclusion; clasts subangular
98HJB0162	98HJB0052	55M	15	412528	7054567	Ts	sandy	Till	45-55	7.5YR 4/3	Brown	Av	Clasts angular to subangular, few rounded, Dubawnt common
98HJB0163	98HJB0054	55M	15	407057	7054690	Tr	sandy	Sand	55-60	7.5YR 4/6	Strong brown	Q	Few pebbles at base of pit.
98HJB0164	98HJB0056	55M	15	400698	7049064	Tp	sandy	Till	45-55	5YR 5/3	Reddish brown	Pgr	Irregular patches of silty sandy red brown diamicton
98STP0021	98HJB0057	55M	15	407136	7028482	Tp	sandy	Till	50	5YR 5/3	Reddish brown	Agq	Few mudboils; pebbles on mudboil surface
98STP0022	98HJB0059	55M	15	402168	7023887	Tp	sandy	Till	45	5YR 5/3	Reddish brown	As	Till very dry and pebbly

Appendix A.3
Sediment Sample Location and Description
MacQuoid Lake area

Station No.	Sample No.	NTS	UTM			Quaternary Unit	Texture	Sediment Type	Depth (cm)	Munsell Colour		Underlying Lithology	Field Observations/Comments
			Zone	Easting	Northing					Colour	Description		
98HJB0165	98HJB0060	55M	15	406602	7049647	Tp	sandy	Till	45-55	7.5YR 5/3	Brown	Q	Sticky, wet, wall collapsing; clasts angular to subrounded
98STP0023	98HJB0061	55M	15	407683	7023737	Tp (Tr)	sand	Sand	55	19YR 5/4	Yellowish brown	Q	Very dry till, clasts at base of pit
98HJB0166	98HJB0062	55M	15	412375	7049466	Tp	silty-sand	Till	45	7.5YR 5/3	Brown	Av	Thin layer of red till present; clasts angular to subrounded
98STP0024	98HJB0063	55M	15	412251	7023229	Tp (Am)	sandy	Till	60	5YR 5/3	Reddish brown	Q	Till saturated w/ water; numerous cobbles and pebbles
98HJB0167	98HJB0064	55M	15	418933	7051031	Tp (R/T)	sandy	Sand	40-45	7.5YR 5/4	Brown	Afv	Variable texture and colour; sandy below 45cm
98STP0025	98HJB0065	55M	15	418035	7023054	Tp	sandy	Till	55	7.5YR 5/4	Brown	Q	Near beach; Small pebbles in a relatively moist till.
98HJB0168	98HJB0066	55M	15	423071	7049574	R/T	silty	Till	45-50	7.5YR 5/3	Brown	Agq	Till wet and sticky; few roots around pebbles; clasts angular
98STP0026	98HJB0067	55M	15	422728	7024351	Ts	silty	Till	55	5YR 5/3	Reddish brown	Q	Good till; numerous cobbles and pebbles at base of pit
98HJB0169	98HJB0068	55M	15	422455	7045231	Tp	silty	Till	45-55	7.5YR 5/3	Brown	Q	Taken from fresh mudboil w/ angular pebbles on top; colour variation in pit.
98STP0027	98HJB0069	55M	15	423622	7018466	Tp (Tr)	sandy	Till	60	5YR 5/4	Reddish brown	Pgr	Dry till w/ numerous clasts, subangular
98HJB0170	98HJB0070	55M	15	418395	7045281	Tp (Mn)	sandy	Till	45	7.5YR 5/3	Brown	Q	Red silty till patches present.
98STP0028	98HJB0071	55M	15	418034	7019288	Tp (Tr)	sandy	Till	55	7.5YR 5/2	Brown	Pgr	Dry till w/numerous clasts; subangular; roots throughout.
98HJB0172	98HJB0072	55M	15	401934	7019946	R/Tr	silty-sand	Till	45	10YR 5/3	Brown	Agn	Clasts angular to subangular
98STP0029	98HJB0073	55M	15	406756	7018591	Tr	sandy	Till	50	5YR 5/3	Reddish brown	Agn	Large pebbles at base, subrounded. Near felsenmeer.
98HJB0171	98HJB0074	55M	15	410839	7018659	Tr	sandy	Diamicton	25-35	7.5YR 4/3	Brown	Agn/Agq	Collected f. fresh mudboil within Rogen moraine. High organic content.
98HJB0190	98HJB0075	55M	15	412588	7056979	Tp	silty	Till	45	2.5YR5/4	Reddish brown	Av	Till plain slopes gently upward to beach deposit. Composite sample.

Additional samples (55M)

Station No.	Sample No.	NTS	UTM			Quaternary Unit	Texture	Sediment Type	Depth (cm)	Munsell Colour		Underlying Lithology	Field Observations/Comments
			Zone	Easting	Northing					Colour	Description		
98HJB0099	98HJB0001	55M	15	359502	7062354		silty-clay	Till	45	10R 4/4	weak red	granitoid	composite sample (2); red brown silty clay diamicton with inclusions of red clayey diamict
98HJB0100	98HJB0002	55M	15	361528	7058283		silty	Till	40	2.5YR 6/4	light reddish brown	granitoid	Composite sample (2); silty diamicton; water content high in one hole
98HJB0103	98HJB0003	55M	15	444379	7049258		sandy	Till	40-45	2.5Y 5/2	Greyish brown	mafic volc.	Samples taken near Iron formation in bedrock depression
98HJB0103	98HJB0004	55M	15	444294	7049731		silty	Till	43	10Y 4/3	Brown	mafic volc.	marine sediment with shells present at lower elevations
98HJB0103	98HJB0005	55M	15	444321	7049231		sandy	Till	35	7.5YR 5/2	Brown	mafic volc.	
98HJB0111	98HJB0006	55M	15	392048	7085926		sandy	Till	40	7.5YR 6/3	light brown	Kasan Fm.	Composite sample(2); one sticky, one loose
98HJB0112	98HJB0007	55M	15	395508	7082536		sandy	Till	45-50	2.5YR 5/4	reddish brown	Kasan Fm.	Composite sample (2); thick (15-20cm) organic covering in area, small shrubs, lichen & m
98HJB0113	98HJB0008	55M	15	399318	7077575		sandy	Till	45	10YR 6/2	brown	granitoid	Composite sample (2)
98HJB0114	98HJB0009	55M	15	401439	7073536		silty	Till	45	10YR 6/3	Pale brown	granitoid	Composite sample (2); moderately pebbly, sticky, some pebbles appear rounded

Appendix B
Heavy Mineral Fraction Mineralogy (<250 µm)

Appendix B.1 Rankin Inlet area

Method

Counted under binocular microscope at Consorminex Inc.
Percent proportion heavy minerals, >3.3 s.g., 63-250 µm, epoxy cement mount, 200 grains counted.

Heavy minerals:

PY=pyrite; Pg=pyrite, goethite covered; HM=hematite; Hr=hematite, round; IL=ilmenite;
It=ilmenite, multi-xtalline; RU=rutile; Ro=rutile, orange; LX=leucoxene; GO=goethite;
SD=siderite; MZ=monazite; HB=hornblende; Hc=hornblende, brown; CP=clinopyroxene;
DP=diopside; OP=orthopyroxene; EP=epidote; Cl=clinozoisite; Ek=epidote, kaki;
GA=garnet, pink; Gi=garnet, colourless; Gj=garnet, orange; SP=titanite; ST=staurolite;
ZR=zircon; KY=kyanite; OV=olivine; Ia=colourless, anisotropic; UK=unknown and unidentifiables.

Appendix B.2 MacQuoid Lake area

Method

Counted under binocular microscope at Consorminex Inc.
Percent proportion heavy minerals, >3.3 s.g., 125-250 µm, epoxy cement mount, 300 grains counted.

Heavy minerals:

HB=hornblende; GA=garnet,pink; Gj=garnet, orange; EP=epidote; Cl=clinozoisite; Ek=epidote, kaiki;
DP=diopside; OP=orthopyroxene; HM=hematite; Hr=hematite, rounded; GO=goethite; IL=ilmenite;
ST=staurolite; RU=rutile; KY=kyanite; LX=leucoxene; ZR=zircon; Zm=zircon, metamict; Ze=zircon, rounded;
TI=titanite; Mz=monazite;UK=unknown or unidentifyable.

Appendix B.1
Heavy Mineral Fraction Mineralogy (63-250 µm)
Rankin Inlet area

Sample	Station ID	Easting	Northing	UTM	PY (%)	Pg (%)	HM (%)	Hr (%)	IL (%)	It (%)	RU (%)	Ro (%)	LX (%)	GO (%)	SD (%)	MZ (%)	HB (%)	Hc (%)	CP (%)
97MOB0094*	MOB970198	554257	6980726	15	0.0	0.0	14.5	0.5	12.5	0.0	0.0	0.5	0.5	0.0	0.0	0.0	28.5	0.0	0.0
97MOB0095*	MOB970199	554050	6981000	15	0.0	0.0	4.5	1.0	4.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	53.5	1.5	1.5
97MOB0097	MOB970201	554374	6981238	15	0.0	0.0	11.0	0.0	4.5	0.0	0.0	-	0.5	0.5	0.0	0.0	25.0	2.0	0.0
97MOB0098*	MOB970202	554553	6981493	15	0.0	0.0	5.5	2.0	2.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	49.5	0.0	0.0
97MOB0103*	MOB970207	554041	6981447	15	0.0	0.0	6.5	0.5	5.5	0.0	0.5	0.0	0.5	0.0	0.0	0.0	55.5	0.0	0.0
97MOB0104*	MOB970208	554542	6981150	15	0.0	1.0	4.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.5	2.0	0.0
97MOB0106	MOB970210	555057	6981065	15	0.0	0.5	10.0	0.0	5.0	0.5	0.0	-	0.0	0.0	0.0	0.0	29.5	1.0	0.0
97MOB0107	MOB970211	555251	6980224	15	0.0	0.0	10.5	0.0	3.0	0.0	0.0	-	0.0	0.5	0.0	0.5	24.0	0.5	0.0
97MOB0108*	MOB970212	555116	6980517	15	0.0	0.5	10.0	3.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.0	0.0	0.0
97MOB0111*	MOB970215	555283	6981204	15	0.0	0.0	5.5	4.0	4.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	50.0	1.0	0.0
97MOB0112*	MOB970216	555555	6981484	15	0.0	0.0	6.0	4.5	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.5	1.5	0.0
97MOB0115*	MOB970219	555737	6980678	15	0.0	0.0	10.0	4.5	9.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	34.5	0.0	0.0
97MOB0116*	MOB970220	555557	6980417	15	0.0	0.0	9.5	2.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.5	0.0	0.0
97MOB0118*	MOB970222	555704	6980308	15	0.0	0.5	18.0	1.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.5	0.5	0.0
97MOB0123	MOB970242	580085	6973845	15	0.0	1.0	6.5	0.0	7.5	3.0	0.0	-	0.0	2.0	0.0	0.0	25.5	0.0	0.0
97MOB0125*	MOB970248	555031	6979472	15	0.0	0.5	13.5	0.5	19.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.5	0.0
97MOB0127	MOB970250	555566	6979063	15	0.0	0.0	11.0	0.0	6.5	0.0	0.0	-	0.0	2.0	0.0	0.0	28.0	0.0	0.0
97MOB0128*	MOB970251	555963	6979035	15	0.0	0.5	11.5	2.5	8.5	2.5	0.5	0.0	0.0	0.0	0.0	0.0	23.5	0.5	0.0
97MOB0130*	MOB970252	555990	6979487	15	0.0	0.0	14.5	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.5	0.0	0.0
97MOB0131*	MOB970253	556517	6979345	15	0.0	0.5	10.5	1.5	7.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	23.5	2.0	0.0
97MOB0132	MOB970254	557039	6978991	15	0.0	0.5	8.0	0.0	3.0	0.0	0.0	-	0.0	0.0	0.0	0.0	29.0	1.5	0.0
97MOB0138	MOB970260	556543	6980067	15	0.0	0.0	16.5	0.5	3.5	0.0	0.0	-	0.0	0.0	0.0	0.0	23.0	0.0	0.0
97MOB0161	MOB970341	540744	6986665	15	0.0	1.0	7.5	0.0	5.5	0.0	0.0	-	0.0	2.0	4.0	0.5	26.0	0.0	0.0
97MOB0162*	MOB970342	540765	6986636	15	1.0	3.5	11.5	0.0	6.5	2.0	0.0	-	0.5	2.5	8.0	0.0	7.5	0.5	0.0
97MOB0163*	MOB970343	540989	6986455	15	0.0	2.5	9.0	0.0	6.0	0.0	0.0	-	0.0	1.0	3.0	0.0	21.5	0.0	0.0
97MOB0164	MOB970344	541244	6986239	15	0.0	4.0	13.0	0.0	9.0	0.0	0.5	-	1.0	1.5	1.5	0.0	23.0	0.5	0.0
97MOB0165*	MOB970345	541433	6986054	15	0.0	0.5	6.5	0.5	8.0	1.5	0.0	-	0.5	0.5	0.0	0.0	21.5	1.0	0.5
97MOB0166	MOB970346	541807	6985800	15	0.0	0.5	9.0	1.0	9.5	0.0	0.0	-	0.0	0.5	0.0	0.0	27.5	0.0	0.0
98MOB0008	MOB980023	580138	6972678	15	0.0	0.0	5.5	0.0	27.0	0.0	0.0	-	2.0	0.0	0.0	0.5	7.0	0.0	1.0
98MOB0011	MOB980029	584462	6971204	15	0.0	0.5	7.5	0.0	8.5	5.0	0.5	-	0.0	4.5	0.0	0.0	12.5	0.0	0.5
98MOB0014*	MOB980033	553480	6981443	15	0.0	0.0	8.0	0.0	8.5	0.0	0.0	-	0.0	0.0	0.0	0.0	12.5	0.0	0.5
98MOB0016*	MOB980035	553401	6980396	15	0.5	0.0	6.0	0.0	7.0	1.0	0.0	-	0.0	0.0	0.0	0.0	25.0	1.0	0.0
98MOB0017*	MOB980036	553988	6980453	15	0.0	1.0	15.0	0.0	7.0	0.0	0.0	-	0.0	1.0	0.0	0.0	10.5	0.0	1.0
98MOB0018*	MOB980037	553011	6979853	15	0.0	0.0	20.0	0.0	12.5	0.0	0.0	-	0.0	0.5	0.0	0.0	14.0	0.0	1.0
98MOB0019*	MOB980038	554525	6980027	15	0.0	0.0	12.0	0.0	14.0	0.0	0.0	-	0.0	0.0	0.0	0.0	8.0	1.0	0.0
98MOB0020*	MOB980039	554565	6979587	15	0.0	0.0	17.5	0.5	4.5	0.0	0.5	-	0.0	0.5	0.0	0.0	17.0	1.0	0.0
98MOB0021*	MOB980040	553927	6978736	15	0.0	0.5	7.0	0.5	7.0	0.0	0.0	-	0.5	0.0	0.0	0.0	18.0	0.5	0.0
98MOB0023*	MOB980042	554732	6978807	15	0.0	0.0	7.0	1.0	11.0	0.0	0.0	-	0.0	0.0	0.0	0.0	21.0	0.0	0.0
98MOB0024	MOB980044	556147	6977923	15	0.0	0.5	11.0	0.0	10.0	0.0	0.0	-	0.0	0.5	0.0	0.0	19.0	0.5	0.0
98MOB0025*	MOB980045	556408	6977752	15	0.0	0.5	11.0	0.0	12.5	1.0	0.0	-	0.0	0.0	0.0	0.0	11.0	0.0	0.0
98MOB0031*	MOB980058	558570	6977589	15	0.0	0.0	5.5	0.0	12.0	0.0	0.0	-	0.0	0.0	0.0	0.0	17.0	0.0	0.0
98MOB0032*	MOB980059	558123	6977604	15	0.0	1.0	10.0	1.0	16.5	3.0	0.0	-	0.0	0.0	0.0	0.0	15.5	0.0	0.5
98MOB0034*	MOB980061	557111	6978113	15	0.0	0.0	15.5	1.5	18.0	0.0	0.5	-	0.0	0.0	0.0	0.0	14.5	0.5	0.0
98MOB0036*	MOB980063	557891	6978037	15	0.0	0.0	11.0	0.0	7.0	0.0	0.0	-	0.5	0.0	0.0	0.0	16.0	0.0	0.0
98MOB0037*	MOB980064	558102	6978414	15	0.0	0.0	9.5	1.5	3.5	0.0	0.0	-	0.0	0.0	0.0	0.0	11.5	0.0	0.0
98MOB0038*	MOB980065	557692	6978498	15	0.0	0.5	13.0	1.0	14.0	1.0	0.0	-	0.0	0.0	0.0	0.0	13.0	0.0	0.0
98MOB0039*	MOB980066	557147	6978546	15	0.0	0.0	9.5	0.0	7.0	0.5	0.0	-	0.5	0.5	0.0	0.0	12.5	0.0	0.0
98MOB0040*	MOB980067	556595	6978581	15	0.0	0.0	4.5	0.0	7.0	0.0	0.0	-	0.5	0.0	0.0	0.0	28.0	0.5	0.0

* Sample not analysed for indicator minerals because only the 63-250 µm HMC fraction was separated from 3-kg sample split

Appendix B.1
Heavy Mineral Fraction Mineralogy (63-250 µm)
Rankin Inlet area

Sample	Station ID	Easting	Northing	UTM	PY (%)	Pg (%)	HM (%)	Hr (%)	IL (%)	It (%)	RU (%)	Ro (%)	LX (%)	GO (%)	SD (%)	MZ (%)	HB (%)	Hc (%)	CP (%)
98MOB0041*	MOB980068	556027	6978660	15	0.0	0.5	10.0	0.0	12.0	1.0	0.5	-	0.0	0.0	0.0	0.0	12.5	0.0	0.0
98MOB0061	MOB980094	579476	6984781	15	0.0	0.0	0.0	0.0	6.5	0.0	0.0	-	0.0	0.0	0.0	0.0	40.0	0.5	0.0
98MOB0072	MOB980105	587882	6973323	15	0.0	1.0	6.0	0.5	9.5	0.5	0.0	-	0.0	1.0	0.0	0.0	24.0	0.0	0.0
98MOB0074	MOB980108	579638	6968840	15	0.0	0.0	6.5	0.0	16.0	0.0	0.0	-	0.0	0.5	0.0	0.0	13.5	0.5	0.0
98MOB0075	MOB980109	575627	6969116	15	0.0	1.5	7.0	0.0	5.0	0.0	0.0	-	0.0	0.5	0.0	0.0	25.5	0.5	0.0
98MOB0077	MOB980111	571958	6968693	15	0.0	1.0	22.0	1.0	9.0	0.0	0.0	-	0.0	0.0	0.0	0.0	21.5	2.0	0.0
98MOB0099	MOB980140	511989	6988984	15	0.0	0.0	6.5	0.0	6.5	0.0	0.0	-	0.0	0.0	0.0	0.0	15.5	0.0	0.5
98MOB0114	MOB980173	571887	6973212	15	0.0	0.0	11.0	0.0	12.5	0.0	0.0	-	0.0	0.0	0.0	0.0	16.5	0.0	0.0
98MOB0129	MOB980189	560784	6973761	15	0.0	0.0	11.0	1.0	12.5	0.0	0.5	-	0.0	0.5	0.0	0.0	13.0	0.5	0.5
98MOB0131	MOB980193	555794	6973176	15	0.0	0.5	17.5	1.5	8.5	0.0	0.0	-	0.0	0.0	0.0	0.0	7.5	0.5	0.0
98MOB0133	MOB980195	547857	6972989	15	0.0	1.0	20.0	1.5	9.0	0.0	0.0	-	0.0	0.5	0.0	0.0	19.0	0.0	0.5
98MOB0135	MOB980197	535905	6972991	15	0.0	0.0	25.5	3.5	6.0	0.5	0.0	-	0.5	0.0	0.0	0.0	21.5	0.0	0.0
98MOB0144*	MOB980206	551896	6981068	15	0.0	5.5	17.5	1.5	10.5	0.5	0.0	-	0.5	1.5	0.0	0.0	12.5	0.0	0.0
98MOB0146	MOB980208	551904	6984968	15	0.0	1.0	14.5	0.0	4.0	0.0	0.0	-	0.0	2.0	0.0	0.0	19.0	0.5	0.0
98MOB0148	MOB980210	544163	6984978	15	0.0	1.0	7.5	2.0	6.5	1.0	0.0	-	0.5	0.5	0.0	0.0	16.0	0.0	0.0
98MOB0150	MOB980212	536058	6984785	15	0.0	0.5	17.5	3.0	1.5	0.0	0.0	-	0.5	0.5	0.0	0.0	15.0	0.0	0.0
98MOB0155	MOB980217	536044	6980916	15	0.0	0.0	12.0	0.0	3.5	0.0	0.0	-	0.0	0.0	0.0	0.0	30.5	0.0	0.0
98MOB0157	MOB980219	544104	6981015	15	0.0	1.5	15.5	1.0	10.5	0.5	0.0	-	0.0	0.5	0.0	0.0	13.5	0.5	0.0
98MOB0160	MOB980222	539711	6988759	15	0.0	0.0	19.0	2.0	1.5	0.0	0.5	-	0.0	0.0	0.0	0.0	10.0	0.5	0.0
98MOB0161	MOB980223	536149	6989181	15	0.0	0.0	17.5	1.0	4.5	0.5	0.0	-	0.5	1.0	0.0	0.0	12.0	0.0	0.0
98MOB0162*	MOB980224	531952	6988673	15	0.0	0.5	15.0	1.0	7.5	0.0	0.0	-	0.0	1.0	0.0	0.0	11.0	0.5	0.0
98MOB0165	MOB980227	531920	6993285	15	0.0	0.0	19.0	1.5	4.0	0.5	0.0	-	0.0	0.0	0.0	0.5	8.5	0.0	0.0
98MOB0167	MOB980229	539844	6992815	15	0.0	0.0	15.0	1.0	4.0	0.0	0.5	-	0.5	0.0	0.0	0.0	12.5	0.0	0.0
98MOB0169	MOB980231	548308	6992992	15	0.0	0.0	5.5	0.0	2.5	0.0	0.0	-	0.0	0.0	0.0	0.0	15.5	0.0	0.0
98MOB0184	MOB980250	529894	7010537	15	0.0	0.0	1.0	0.0	4.5	0.0	0.0	-	0.0	0.0	0.0	0.0	18.5	0.0	0.0
98MOB0188	MOB980271	504900	7011083	15	0.0	0.0	17.0	2.0	4.5	0.0	0.0	-	0.0	0.5	0.0	0.0	25.0	1.0	0.0
98MOB0190	MOB980273	515231	7010991	15	0.0	0.0	9.0	0.5	4.5	0.0	0.0	-	0.0	1.0	0.0	0.0	12.0	0.0	0.0
98MOB0206*	MOB980290	500338	6985638	15	0.0	1.0	57.5	3.0	2.5	0.0	0.0	-	0.0	2.5	0.0	0.0	7.5	0.0	0.0
98MOB0210	MOB980295	519769	6996964	15	0.0	0.5	21.0	1.0	2.5	0.0	0.5	-	0.0	0.0	0.0	0.0	15.0	0.0	0.0

Sample	Station ID	Easting	Northing	UTM	DP (%)	OP (%)	EP (%)	CL (%)	Ek (%)	GA (%)	Gi (%)	Gj (%)	SP (%)	ST (%)	ZR (%)	KY (%)	OV (%)	Ia (%)	UK (%)
97MOB0094*	MOB970198	554257	6980726	15	4.5	2.5	7.0	0.0	0.0	1.5	22.0	3.0	0.5	0.0	0.5	0.0	0.0	0.0	1.5
97MOB0095*	MOB970199	554050	6981000	15	9.0	3.0	10.5	0.0	0.0	0.5	5.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	2.0
97MOB0097	MOB970201	554374	6981238	15	11.5	6.0	8.5	0.5	0.0	14.5	7.0	0.5	2.0	0.0	3.0	0.0	0.0	1.0	2.0
97MOB0098*	MOB970202	554553	6981493	15	11.5	5.0	6.5	0.0	0.0	0.0	7.5	4.5	2.0	0.0	0.5	0.0	0.0	0.0	3.0
97MOB0103*	MOB970207	554041	6981447	15	5.5	8.5	5.5	0.0	0.0	0.5	6.5	3.5	0.5	0.0	0.0	0.0	0.0	0.0	0.5
97MOB0104*	MOB970208	554542	6981150	15	3.5	13.0	5.5	0.0	0.0	2.5	9.0	0.5	1.0	0.0	0.0	0.0	0.0	0.0	1.5
97MOB0106	MOB970210	555057	6981065	15	5.5	5.0	7.5	1.5	0.0	19.5	10.0	2.0	0.0	0.0	0.5	0.0	0.0	0.5	1.5
97MOB0107	MOB970211	555251	6980224	15	9.5	6.5	6.0	1.0	0.0	25.0	7.0	2.0	2.0	0.0	1.0	0.0	0.0	0.0	1.0
97MOB0108*	MOB970212	555116	6980517	15	8.5	3.5	5.5	0.0	0.0	2.0	17.0	3.0	0.0	0.0	0.5	0.0	0.0	0.0	1.5
97MOB0111*	MOB970215	555283	6981204	15	4.5	2.5	7.0	0.0	0.0	1.0	16.0	2.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0
97MOB0112*	MOB970216	555555	6981484	15	11.0	2.5	5.5	0.0	0.0	0.0	18.5	5.5	0.5	0.0	0.5	0.0	0.0	0.0	2.5
97MOB0115*	MOB970219	555737	6980678	15	5.5	6.0	3.5	0.5	0.0	0.0	19.5	5.0	0.0	0.0	1.0	0.0	0.0	0.0	0.5
97MOB0116*	MOB970220	555557	6980417	15	7.0	4.5	2.5	0.0	0.0	0.5	27.0	3.0	2.0	0.0	2.5	0.0	0.0	0.0	0.5
97MOB0118*	MOB970222	555704	6980308	15	4.0	4.5	6.5	0.0	0.0	0.5	36.5	1.0	1.5	0.0	0.0	0.0	0.0	0.0	1.0
97MOB0123	MOB970242	580085	6973845	15	15.5	5.0	9.0	5.0	0.0	11.0	2.0	3.5	0.5	0.5	0.0	0.0	1.0	1.0	0.5
97MOB0125*	MOB970248	555031	6979472	15	3.0	4.0	8.0	0.0	0.0	0.0	31.0	2.5	1.0	0.0	0.5	0.0	0.0	0.0	0.5

* Sample not analysed for indicator minerals because only the 63-250 µm HMC fraction was separated from 3-kg sample split

Appendix B.1
Heavy Mineral Fraction Mineralogy (63-250 µm)
Rankin Inlet area

Sample	Station ID	Easting	Northing	UTM	DP (%)	OP (%)	EP (%)	CL (%)	Ek (%)	GA (%)	Gi (%)	Gj (%)	SP (%)	ST (%)	ZR (%)	KY (%)	OV (%)	Ia (%)	UK (%)
97MOB0127	MOB970250	555566	6979063	15	3.0	3.5	14.0	1.5	0.0	23.0	4.5	0.5	1.0	0.0	0.0	0.0	0.0	0.0	1.5
97MOB0128*	MOB970251	555963	6979035	15	5.5	1.5	6.0	0.0	0.0	0.5	30.0	4.5	1.0	0.0	1.0	0.0	0.0	0.0	0.0
97MOB0130*	MOB970252	555990	6979487	15	5.5	7.0	4.5	0.0	0.0	0.5	33.0	1.0	3.5	0.0	0.5	0.0	0.0	0.0	0.5
97MOB0131*	MOB970253	556517	6979345	15	4.5	7.0	7.0	0.0	0.0	0.0	29.5	3.0	0.5	0.5	0.0	0.0	0.0	0.0	2.0
97MOB0132	MOB970254	557039	6978991	15	7.5	3.0	13.0	1.5	0.0	24.5	4.0	2.0	1.0	0.0	0.0	0.0	0.0	1.0	0.5
97MOB0138	MOB970260	556543	6980067	15	10.0	7.0	9.5	0.0	0.0	21.0	3.0	0.5	1.0	0.0	1.0	0.0	0.0	1.0	2.5
97MOB0161	MOB970341	540744	6986665	15	6.0	2.5	12.5	1.0	0.0	19.0	4.5	2.0	1.5	0.0	0.5	0.0	0.0	1.0	3.0
97MOB0162*	MOB970342	540765	6986636	15	5.0	6.0	16.5	1.5	0.0	13.5	4.5	0.5	0.5	0.0	1.0	0.0	1.5	3.5	2.5
97MOB0163*	MOB970343	540989	6986455	15	9.5	2.0	20.0	3.5	0.0	14.0	5.0	1.5	0.0	0.0	0.0	0.0	0.0	1.5	0.0
97MOB0164	MOB970344	541244	6986239	15	1.5	7.5	13.0	1.5	0.0	16.0	3.5	0.0	1.0	0.0	0.5	0.0	0.0	0.0	1.5
97MOB0165*	MOB970345	541433	6986054	15	1.0	9.0	16.5	0.0	0.0	17.5	9.5	1.0	3.5	0.0	0.0	0.0	0.0	0.0	1.0
97MOB0166	MOB970346	541807	6985800	15	1.5	8.5	14.5	0.0	0.0	19.0	4.0	0.0	2.5	0.0	1.5	0.0	0.0	0.0	0.5
98MOB0008	MOB980023	580138	6972678	15	4.5	3.5	15.5	0.0	0.0	17.5	10.0	0.0	1.5	0.0	2.0	0.0	0.0	0.0	2.5
98MOB0011	MOB980029	584462	6971204	15	6.0	0.5	18.0	0.0	0.0	19.0	15.0	0.5	0.5	0.0	0.5	0.0	0.0	0.0	0.5
98MOB0014*	MOB980033	553480	6981443	15	9.5	6.5	17.0	0.0	0.0	20.0	13.5	1.0	1.0	0.0	0.5	0.0	0.0	0.0	1.5
98MOB0016*	MOB980035	553401	6980396	15	8.0	4.0	14.5	0.0	0.0	20.0	7.0	0.0	0.0	0.0	1.0	0.0	0.0	3.5	1.5
98MOB0017*	MOB980036	553988	6980453	15	4.0	10.0	7.5	2.0	0.0	28.0	9.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
98MOB0018*	MOB980037	553011	6979853	15	4.0	5.5	11.5	0.5	0.0	18.0	9.0	0.5	1.0	0.0	0.5	0.0	0.0	0.0	1.5
98MOB0019*	MOB980038	554525	6980027	15	5.0	8.0	17.0	1.0	0.0	23.5	7.5	0.0	1.0	0.0	0.5	0.0	0.0	0.0	1.5
98MOB0020*	MOB980039	554565	6979587	15	4.5	6.0	9.5	0.0	0.0	24.5	9.5	0.0	2.5	0.0	1.5	0.0	0.0	0.0	0.5
98MOB0021*	MOB980040	553927	6978736	15	8.5	5.5	18.0	0.0	0.0	25.5	4.5	0.0	2.5	0.0	0.0	0.0	0.0	0.0	1.5
98MOB0023*	MOB980042	554732	6978807	15	12.0	4.0	19.0	0.0	0.0	17.5	2.5	0.0	1.5	0.0	1.0	0.0	0.0	0.0	2.5
98MOB0024	MOB980044	556147	6977923	15	8.5	4.5	7.5	0.5	0.0	26.0	8.0	0.0	1.0	0.0	0.5	0.0	0.0	0.0	2.0
98MOB0025*	MOB980045	556408	6977752	15	5.0	4.0	8.0	0.0	0.0	28.0	9.0	0.0	3.0	0.0	1.0	0.0	0.0	4.5	1.5
98MOB0031*	MOB980058	558570	6977589	15	8.5	6.0	11.5	0.0	1.0	27.0	5.0	0.0	1.5	0.0	0.0	0.0	0.0	5.0	0.0
98MOB0032*	MOB980059	558123	6977604	15	6.5	0.5	10.0	0.0	0.0	24.0	4.5	0.0	1.0	0.0	0.5	0.0	0.0	3.0	2.5
98MOB0034*	MOB980061	557111	6978113	15	4.0	1.0	11.5	0.0	0.0	25.0	5.5	0.0	0.0	0.0	0.5	0.0	0.0	1.0	1.0
98MOB0036*	MOB980063	557891	6978037	15	18.0	2.5	9.5	0.0	0.5	23.0	4.0	0.0	2.0	0.0	0.5	0.0	0.0	3.5	2.0
98MOB0037*	MOB980064	558102	6978414	15	6.0	10.0	13.0	0.0	0.0	28.0	5.5	0.0	1.0	0.0	3.5	0.0	0.0	6.0	1.0
98MOB0038*	MOB980065	557692	6978498	15	8.5	8.0	10.5	0.0	0.0	11.0	16.5	0.0	0.5	0.0	1.0	0.0	0.0	0.0	1.5
98MOB0039*	MOB980066	557147	6978546	15	8.0	5.5	16.5	0.5	0.0	29.0	7.0	0.0	1.0	0.0	0.5	0.0	0.0	1.0	0.5
98MOB0040*	MOB980067	556595	6978581	15	10.5	3.0	17.5	0.0	1.5	19.5	4.0	0.0	0.0	0.0	1.0	0.0	0.0	1.5	1.0
98MOB0041*	MOB980068	556027	6978660	15	9.0	3.5	11.5	0.0	0.0	29.5	8.0	0.5	0.5	0.0	0.5	0.0	0.0	0.5	0.0
98MOB0061	MOB980094	579476	6984781	15	16.0	4.5	12.0	0.0	0.0	12.5	2.5	0.0	1.0	0.0	0.5	1.0	0.0	1.5	1.5
98MOB0072	MOB980105	587882	6973323	15	11.0	5.5	14.0	0.0	0.0	20.0	4.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	2.0
98MOB0074	MOB980108	579638	6968840	15	16.5	2.0	15.0	0.0	0.0	24.5	4.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5
98MOB0075	MOB980109	575627	6969116	15	16.0	0.5	8.0	0.0	1.5	23.0	4.5	0.0	2.0	0.5	1.0	0.0	0.0	0.0	3.0
98MOB0077	MOB980111	571958	6968693	15	11.5	1.0	5.5	0.0	0.0	17.0	3.0	0.0	1.0	0.0	1.0	0.0	1.5	0.0	2.0
98MOB0099	MOB980140	511989	6988984	15	6.5	1.0	4.0	0.0	0.0	39.5	10.0	0.0	1.5	7.0	0.5	0.0	0.0	0.0	1.0
98MOB0114	MOB980173	571887	6973212	15	12.0	1.5	6.5	0.0	0.0	30.5	5.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0	3.5
98MOB0129	MOB980189	560784	6973761	15	11.0	2.0	7.0	0.0	0.0	29.5	7.5	0.0	1.0	0.0	2.0	0.0	0.0	0.0	0.5
98MOB0131	MOB980193	555794	6973176	15	6.0	1.5	10.5	0.0	0.5	31.0	11.0	1.0	0.0	0.0	0.0	0.0	0.0	1.5	1.0
98MOB0133	MOB980195	547857	6972989	15	6.0	2.0	10.5	0.0	0.0	22.0	4.0	0.0	1.0	0.5	1.0	0.0	1.0	0.0	0.5
98MOB0135	MOB980197	535905	6972991	15	9.5	1.0	7.0	0.0	0.0	18.5	2.5	0.0	1.5	0.0	0.5	0.0	1.0	0.0	1.0
98MOB0144*	MOB980206	551896	6981068	15	7.0	1.0	11.0	0.0	0.0	25.5	2.0	0.0	0.0	0.0	0.5	0.0	1.0	0.0	2.0
98MOB0146	MOB980208	551904	6984968	15	10.5	2.0	7.0	0.0	0.5	32.5	3.5	0.0	0.5	0.0	1.5	0.0	0.0	0.0	1.0
98MOB0148	MOB980210	544163	6984978	15	4.5	3.0	12.5	0.5	1.0	32.5	2.0	2.0	3.5	0.0	0.5	0.0	2.5	0.0	0.5
98MOB0150	MOB980212	536058	6984785	15	7.0	4.0	11.5	0.0	0.0	32.5	3.5	0.0	1.5	0.0	0.0	0.0	0.5	0.0	1.0

* Sample not analysed for indicator minerals because only the 63-250 µm HMC fraction was separated from 3-kg sample split

Appendix B.1
Heavy Mineral Fraction Mineralogy (63-250 µm)
Rankin Inlet area

Sample	Station ID	Easting	Northing	UTM	DP (%)	OP (%)	EP (%)	CL (%)	Ek (%)	GA (%)	Gi (%)	Gj (%)	SP (%)	ST (%)	ZR (%)	KY (%)	OV (%)	Ia (%)	UK (%)
98MOB0155	MOB980217	536044	6980916	15	7.5	2.0	12.5	0.0	0.0	28.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
98MOB0157	MOB980219	544104	6981015	15	2.0	5.5	16.0	0.5	0.0	25.0	5.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	1.0
98MOB0160	MOB980222	539711	6988759	15	1.5	2.5	12.0	0.0	0.0	44.5	3.5	0.5	1.0	0.0	0.5	0.0	0.0	0.0	0.5
98MOB0161	MOB980223	536149	6989181	15	5.5	2.5	12.5	0.0	0.0	33.5	4.0	0.5	0.5	0.0	2.0	0.0	0.0	0.0	2.0
98MOB0162*	MOB980224	531952	6988673	15	4.5	3.5	18.0	2.0	0.0	25.0	7.0	0.5	1.0	0.0	0.5	0.0	0.0	0.0	1.5
98MOB0165	MOB980227	531920	6993285	15	4.0	5.5	13.5	1.5	0.0	31.0	2.0	3.5	1.5	0.0	1.0	0.0	0.0	0.0	2.5
98MOB0167	MOB980229	539844	6992815	15	7.5	11.5	13.0	0.5	0.0	28.0	2.5	1.5	0.5	0.0	0.0	0.0	0.0	0.0	1.5
98MOB0169	MOB980231	548308	6992992	15	13.5	12.5	8.5	0.0	0.0	26.5	3.5	3.0	3.5	0.0	0.5	0.0	2.5	1.0	1.5
98MOB0184	MOB980250	529894	7010537	15	43.0	0.0	2.5	0.0	0.0	13.5	3.5	5.5	3.5	0.0	1.5	0.0	0.0	0.0	3.0
98MOB0188	MOB980271	504900	7011083	15	3.0	2.5	12.0	0.0	0.0	23.0	3.0	2.0	2.0	0.0	0.5	0.0	0.0	0.5	1.5
98MOB0190	MOB980273	515231	7010991	15	3.0	3.0	17.0	1.0	0.0	40.0	3.5	3.5	0.5	0.0	0.5	0.0	0.0	0.0	1.0
98MOB0206*	MOB980290	500338	6985638	15	2.0	2.0	7.0	0.0	0.0	8.0	3.5	0.5	0.0	0.0	1.0	0.0	0.0	1.0	1.0
98MOB0210	MOB980295	519769	6996964	15	0.0	7.5	11.0	1.0	0.0	30.5	2.5	3.0	0.0	0.0	0.5	0.0	0.0	0.0	3.5

97MOB0107	Dark orange rutile with elbow twin.
97MOB0123	One convincing olivine grain, should be confirmed using probe or SEM. Several epidote/clinozoisite grains weathered and difficult to identify.
97MOB0138	Sphene has unusual lustre.
97MOB0161	Siderite not the botryoidal variety found in tills farther south (tills derived from formations underlying Hudson Bay). Siderite and goethite can be difficult to tell apart in this sample. Also, pale yellow epidotes should be verified.
97MOB0162	Siderite not the botryoidal variety found in tills farther south (tills derived from formations underlying Hudson Bay). Siderite and goethite can be difficult to tell apart in this sample. Also, pale yellow epidotes should be verified. Good examples of fresh pyrite with very thin, bright red goethite coat.
97MOB0165	Several epidotes partially altered to yellow-orange mineral.
97MOB0166	Several of the sphenes are very pale yellow to colourless; these are difficult to recognize.
98MOB0008	Sphene has unusual lustre and is dark amber.
98MOB0016	Colourless, vitreous, medium relief, anisotropic, mineral should be verified.
98MOB0018	2 possible chrome diopsides.
98MOB0019	Grains in this sample are small.
98MOB0021	One rounded hematite resembling those hematite grains dominating Pitz Formation.
98MOB0061	Hornblende abundant.
98MOB0075	Very good example of pyrite grain covered by thin coat of red goethite.
98MOB0077	Olivine/iddingsite grain.
98MOB0099	Staurolite abundant.
98MOB0131	Very good example of pyrite grain covered by thin coat of red goethite.
98MOB0133	Olivine should be confirmed. Round hematite not likely from Pitz.
98MOB0135	Olivine should be confirmed.
98MOB0148	Thin red coat of goethite protecting pyrite grains.
98MOB0206	Diopside abundant.
98MOB0210	Hematite abundant.

* Sample not analysed for indicator minerals because only the 63-250 µm HMC fraction was separated from 3-kg sample split

Appendix B.2
Heavy Mineral Fraction Mineralogy (125-250 µm)
MacQuoid Lake area

Sample	Station ID	Easting	Northing	UTM	HB (%)	GA (%)	Gj (%)	EP (%)	Cl (%)	Ek (%)	DP (%)	OP (%)	HM (%)	Hr (%)	GO (%)	IL (%)	ST (%)	RU (%)
98HJB0001	98HJB0099	359502	7062354	15	2.3	1.0	0.3	2.3	3.3	0.0	1.7	3.3	55.3	26.0	1.3	1.3	0.0	0.3
98HJB0002	98HJB0100	361528	7058283	15	5.0	1.3	0.0	1.7	4.0	0.0	2.0	3.3	59.7	21.0	0.3	1.0	0.0	0.0
98HJB0003	98HJB0103	444379	7049258	15	15.7	12.0	3.7	14.0	2.7	0.3	1.3	11.7	26.0	5.7	0.0	4.7	0.0	0.0
98HJB0004	98HJB0103	444294	7049731	15	59.0	2.3	0.3	5.0	7.0	0.0	6.0	9.3	4.7	2.3	0.0	2.3	0.0	0.0
98HJB0006	98HJB0111	392048	7085926	15	1.0	1.0	0.3	1.0	2.7	0.0	0.0	0.7	66.3	23.7	0.3	0.7	0.0	0.0
98HJB0007	98HJB0112	395508	7082536	15	10.3	1.3	0.7	8.0	4.7	0.3	2.3	1.3	44.7	23.3	1.0	0.0	0.0	0.0
98HJB0008	98HJB0113	399318	7077575	15	3.3	2.0	1.0	5.0	1.7	0.0	0.3	2.3	65.3	17.0	0.0	0.3	0.3	0.0
98HJB0009	98HJB0114	401439	7073536	15	7.7	2.3	0.7	3.0	7.7	0.0	1.0	2.0	49.0	24.0	1.0	0.0	0.0	0.0
98HJB0010	98HJB0115	405002	7068362	15	3.3	4.0	0.3	2.7	4.3	0.3	1.0	1.3	67.3	14.0	0.0	0.0	0.0	0.0
98HJB0011	98HJB0116	408274	7061924	15	3.0	1.3	0.3	4.3	2.0	0.7	0.3	1.0	63.3	23.0	0.0	0.0	0.0	0.0
98HJB0075	98HJB0190	412588	7056979	15	1.3	0.7	0.0	2.7	2.0	0.0	3.0	1.7	44.0	44.0	0.3	0.0	0.0	0.0

Sample	Station ID	Easting	Northing	UTM	KY (%)	LX (%)	ZR (%)	Zm (%)	Ze (%)	Tl (%)	Mz (%)	UK (%)
98HJB0001	98HJB0099	359502	7062354	15	0.0	0.3	0.3	0.0	0.3	0.0	0.0	0.3
98HJB0002	98HJB0100	361528	7058283	15	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.0
98HJB0003	98HJB0103	444379	7049258	15	0.0	0.0	0.3	0.0	0.0	0.3	0.0	1.7
98HJB0004	98HJB0103	444294	7049731	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
98HJB0006	98HJB0111	392048	7085926	15	0.0	0.3	0.3	0.0	0.0	0.7	0.0	1.0
98HJB0007	98HJB0112	395508	7082536	15	0.0	0.3	0.0	0.0	0.3	1.0	0.0	0.3
98HJB0008	98HJB0113	399318	7077575	15	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.7
98HJB0009	98HJB0114	401439	7073536	15	0.0	0.0	0.0	0.0	0.3	1.0	0.0	0.3
98HJB0010	98HJB0115	405002	7068362	15	0.0	0.0	0.7	0.0	0.0	0.3	0.3	0.0
98HJB0011	98HJB0116	408274	7061924	15	0.3	0.0	0.0	0.0	0.0	0.3	0.0	0.0
98HJB0075	98HJB0190	412588	7056979	15	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0

98HJB-0004	1 blue amphibole noted but not counted.
98HJB-0007	1 olivine noted but not counted.

Appendix C
Weights of Selected Size Fractions

(produced during sample processing and preparation of heavy mineral concentrates for indicator mineral picking)

Appendix C.1
Weights of Selected Size Fractions
Rankin Inlet area

Sample ID	Easting	Northing	UTM Zone	BULK SAMPLE Weight (kg, wet)			TABLE CONCENTRATE <2 mm, Weight (g, dry)								
									M.I. Concentrate			NON-MAG Fraction			
				Total Weight	>2 mm Clasts	Table Feed	Total Weight	M.I. Lights	Conc. Total	NON-MAG	MAG	Total Sieved*	0.25 - 2 mm	0.063-0.25 mm	<0.063 mm
97MOB0097	554374	6981238	15	7.9	1.2	6.7	207.8	159.0	48.8	39.4	9.4	19.7	2.4	14.1	3.2
97MOB0106	555057	6981065	15	9.2	0.8	8.4	265.8	208.0	57.8	52.5	5.3	26.1	4.3	17.5	4.3
97MOB0107	555251	6980224	15	9.1	1.9	7.3	254.0	197.3	56.7	42.5	14.2	21.2	4.2	13.9	3.1
97MOB0123	580085	6973845	15	8.9	1.6	7.3	222.2	160.1	62.1	52.0	10.1	25.8	3.0	18.1	4.7
97MOB0127	555566	6979063	15	7.9	1.9	6.0	209.3	170.6	38.7	32.9	5.8	16.4	1.6	11.7	3.1
97MOB0132	557039	6978991	15	7.9	2.0	5.9	194.1	150.7	43.4	35.0	8.4	17.5	3.5	11.4	2.6
97MOB0138	556543	6980067	15	7.9	2.7	5.3	246.9	197.4	49.5	36.8	12.7	18.1	6.1	10.4	1.6
97MOB0161	540744	6986665	15	9.2	3.1	6.1	265.9	215.9	50.0	41.3	8.7	20.3	3.8	13.5	3.0
97MOB0164	541244	6986239	15	9.3	1.2	8.1	354.3	296.1	58.2	43.1	15.1	21.4	2.9	14.5	4.0
97MOB0166	541807	6985800	15	9.4	0.9	8.5	201.3	151.9	49.4	41.7	7.7	20.8	2.0	14.2	4.6
98MOB0008	580138	6972678	15	8.5	1.1	7.4	397.3	364.0	33.3	28.1	5.2	18.2	3.0	13.8	1.4
98MOB0011	584462	6971204	15	7.8	0.9	6.9	347.9	317.4	30.5	23.8	6.7	13.7	2.2	9.9	1.6
98MOB0024	556147	6977923	15	8.7	1.6	7.1	417.1	360.9	56.2	41.2	15.0	31.1	5.2	22.7	3.2
98MOB0061	579476	6984781	15	8.7	1.7	7.1	500.0	445.8	54.2	44.2	10.0	34.1	5.3	25.5	3.2
98MOB0072	587882	6973323	15	12.0	3.0	9.1	462.5	414.9	47.6	37.2	10.4	27.2	3.4	20.1	3.7
98MOB0074	579638	6968840	15	13.1	2.4	10.7	446.5	388.5	58.0	45.1	12.9	35.1	5.5	25.4	4.1
98MOB0075	575627	6969116	15	13.0	2.0	11.0	464.9	383.2	81.7	62.8	18.9	52.8	7.8	37.8	7.1
98MOB0077	571958	6968693	15	13.0	1.5	11.5	291.5	243.3	48.2	36.6	11.6	26.6	4.9	19.5	2.3
98MOB0099	511989	6988984	15	10.9	3.1	7.9	296.7	207.7	89.0	80.7	8.3	70.7	26.6	39.4	4.6
98MOB0114	571887	6973212	15	7.3	2.0	5.3	218.8	187.0	31.8	23.8	8.0	13.8	1.6	9.9	2.3
98MOB0128	560092	6976843	15	7.2	1.0	6.3	188.9	150.0	38.9	29.2	9.7	19.2	3.4	13.3	2.6
98MOB0129	560784	6973761	15	10.2	1.1	9.1	252.3	201.2	51.1	40.4	10.7	30.3	1.5	22.3	6.5
98MOB0131	555794	6973176	15	6.6	0.9	5.8	169.2	136.8	32.4	26.0	6.4	16.0	2.5	11.6	2.0
98MOB0133	547857	6972989	15	9.4	0.8	8.6	315.4	278.7	36.7	29.4	7.3	19.4	3.0	13.5	2.9
98MOB0135	535905	6972991	15	6.7	0.8	6.0	188.7	160.6	28.1	23.0	5.1	12.9	2.7	8.9	1.4
98MOB0137	527924	6973006	15	6.0	1.0	5.0	176.5	159.0	17.5	13.1	4.4	13.1	2.3	9.3	1.5
98MOB0146	551904	6984968	15	6.4	0.7	5.7	288.4	251.6	36.8	27.3	9.5	17.2	2.1	11.2	3.9
98MOB0148	544163	6984978	15	9.1	2.2	6.9	327.8	287.9	39.9	30.7	9.2	20.7	2.4	14.2	4.0
98MOB0150	536058	6984785	15	8.5	1.6	6.9	301.6	260.3	41.3	32.5	8.8	22.5	3.4	15.6	3.5
98MOB0155	536044	6980916	15	6.4	0.5	5.9	251.2	216.8	34.4	28.0	6.4	17.9	2.9	12.4	2.6
98MOB0157	544104	6981015	15	9.2	2.1	7.2	295.2	250.6	44.6	34.9	9.7	24.9	4.7	16.3	3.9
98MOB0160	539711	6988759	15	6.9	0.9	6.1	208.8	178.0	30.8	24.3	6.5	14.3	2.0	10.2	2.1
98MOB0161	536149	6989181	15	7.2	1.5	5.8	336.7	301.5	35.2	29.0	6.2	18.9	3.1	13.3	2.5
98MOB0165	531920	6993285	15	7.8	0.9	7.0	183.9	145.2	38.7	30.3	8.4	20.3	3.2	14.3	2.7
98MOB0167	539844	6992815	15	7.4	1.0	6.4	271.0	232.4	38.6	29.9	8.7	19.8	3.0	14.0	2.9
98MOB0169	548308	6992992	15	6.3	1.0	5.3	261.7	224.5	37.2	28.3	8.9	18.3	3.0	13.5	1.8
98MOB0176	528152	7000492	15	6.6	1.1	5.6	343.2	298.8	44.4	34.9	9.5	24.8	5.7	16.5	2.6
98MOB0178	536019	7000911	15	6.7	1.6	5.1	365.1	315.8	49.3	41.9	7.4	31.8	6.8	20.9	4.1
98MOB0180	544250	7001230	15	7.2	2.0	5.2	313.5	277.3	36.2	28.9	7.3	18.9	4.4	12.0	2.4
98MOB0184	529894	7010537	15	8.1	1.4	6.7	507.2	442.4	64.8	51.3	13.5	41.2	11.7	26.5	3.1
98MOB0186	540124	7010926	15	6.3	1.3	5.1	348.7	308.9	39.8	32.6	7.2	22.6	4.2	15.7	2.6

Appendix C.1
Weights of Selected Size Fractions
Rankin Inlet area

Sample ID	Easting	Northing	UTM Zone	BULK SAMPLE Weight (kg, wet)			TABLE CONCENTRATE <2 mm, Weight (g, dry)								
									M.I. Concentrate			NON-MAG Fraction			
				Total Weight	>2 mm Clasts	Table Feed	Total Weight	M.I. Lights	Conc. Total	NON-MAG	MAG	Total Sieved*	0.25 - 2 mm	0.063-0.25 mm	<0.063 mm
98MOB0188	504900	7011083	15	10.5	0.9	9.6	345.5	299.5	46.0	37.4	8.6	27.4	4.8	18.6	4.0
98MOB0190	515231	7010991	15	6.2	1.0	5.2	243.6	204.0	39.6	30.8	8.8	20.7	2.6	14.6	3.6
98MOB0193	524607	7006128	15	7.7	1.7	6.0	287.2	249.5	37.7	28.9	8.8	18.9	4.1	11.9	2.9
98MOB0198	505313	7005729	15	6.0	1.0	5.0	207.2	182.6	24.6	19.5	5.1	9.5	1.9	6.4	1.1
98MOB0203	504388	6997340	15	6.8	1.4	5.4	230.9	210.5	20.4	16.2	4.2	16.2	3.6	11.0	1.6
98MOB0205	500253	6992385	15	7.3	1.0	6.3	253.6	226.4	27.2	21.9	5.3	11.8	3.3	7.7	0.8
98MOB0210	519769	6996964	15	5.8	0.8	5.1	224.2	194.8	29.4	23.4	6.0	13.4	2.1	8.9	2.3
98MOB0213	524036	6988822	15	5.5	0.9	4.7	204.9	178.5	26.4	21.3	5.1	11.2	2.1	7.4	1.8
98MOB0217	518769	6985630	15	3.6	0.7	2.9	211.2	198.9	12.3	10.2	2.1	10.2	8.5	6.6	1.3

* Analytical split retrieved for geochemical determinations (1/2 of HMC or at least 10 g)

Appendix C.2
Weights of Selected Size Fractions
MacQuoid Lake area

SAMPLE NUMBER	Easting	Northing	UTM Zone	BULK SAMPLE Weight (kg, wet)				TABLE CONCENTRATE <2.0 mm, Weight (g, dry)								
									M.I. SEPARATION S.G 3.20							
											NON-MAG Fraction					
				Bulk Rec'd	Table Split	>2 mm Clasts	Table Feed	Conc. Total	M.I. Lights	MAG	Total Sieved	<0.25 mm	<0.25 mm (wash)	0.25-0.5 mm	0.5-1.0 mm	1.0-2.0 mm
98HJB0001	359502	7062354	15	3.9	3.5	0.6	2.9	686.4	679.0	0.7	6.7	3.8	0.5	2.1	0.1	0.20
98HJB0002	361528	7058283	15	5.0	4.6	1.0	3.6	563.9	555.7	0.8	7.4	4.5	0.6	2.1	0.1	0.10
98HJB0003	444379	7049258	15	5.7	5.3	1.0	4.3	654.2	620.0	2.7	31.5	21.1	2.5	6.1	0.6	1.20
98HJB0004	444294	7049731	15	6.3	5.8	1.5	4.3	604.8	547.9	3.9	53.0	39.7	3.1	7.8	0.9	1.50
98HJB0005	444321	7049231	15	4.8	4.4	0.9	3.5	613.5	570.3	3.2	40.0	29.5	2.4	6.2	0.6	1.30
98HJB0006	392048	7085926	15	5.4	5.0	0.7	4.3	679.1	655.8	2.6	20.7	15.2	0.9	4.3	0.2	0.10
98HJB0007	395508	7082536	15	5.0	4.6	0.8	3.8	492.3	477.5	1.9	12.9	8.4	0.8	3.4	0.2	0.10
98HJB0008	399318	7077575	15	4.5	4.1	0.4	3.7	647.9	627.9	1.6	18.4	12.4	0.8	4.8	0.3	0.10
98HJB0009	401439	7073536	15	4.6	4.2	1.1	3.1	396.4	380.6	1.5	14.3	9.1	0.9	4.0	0.2	0.10
98HJB0010	405002	7068362	15	4.2	3.8	0.6	3.2	399.6	380.7	1.5	17.4	11.9	0.7	4.4	0.3	0.06
98HJB0011	408274	7061924	15	3.8	3.4	0.3	3.1	560.4	545.9	1.1	13.4	8.4	0.7	3.9	0.3	0.1
98HJB0012	418053	7069234	15	9.4	8.9	1.3	7.7	1050.7	1007.7	4.1	38.9	25.6	0.4	9.9	2.4	0.6
98HJB0013	423559	7069436	15	9.2	8.8	1.4	7.5	982.7	945.6	4.4	32.7	23.5	0.2	6.5	1.9	0.6
98HJB0014	418270	7040694	15	6.2	5.7	1.1	4.6	720.8	698.0	1.6	21.2	14.9	0.1	5.1	1.0	0.1
98HJB0015	422226	7040388	15	6.9	6.3	1.1	5.2	618.2	589.4	1.4	27.4	18.2	1.1	6.8	1.1	0.2
98HJB0016	418257	7065661	15	3.9	3.6	1.0	2.6	649.1	634.5	1.1	13.5	8.0	0.6	3.8	0.8	0.3
98HJB0017	423023	7065533	15	5.4	4.9	1.0	3.9	706.8	686.7	2.7	17.4	11.4	0.2	4.5	1.1	0.2
98HJB0018	418679	7036423	15	1.9	1.6	0.2	1.4	279.7	269.9	0.4	9.4	4.9	0.2	3.5	0.7	0.1
98HJB0019	422200	7036604	15	9.1	8.7	1.9	6.8	997.5	983.1	1.0	13.4	7.3	0.8	4.3	0.8	0.2
98HJB0020	417607	7061945	15	8.1	7.5	1.7	5.9	829.5	795.7	2.5	31.3	20.1	0.4	8.7	1.8	0.3
98HJB0021	422371	7060367	15	6.8	6.4	1.1	5.3	848.9	830.5	1.6	16.8	11.3	0.1	4.2	0.9	0.3
98HJB0022	418217	7033360	15	4.0	3.7	0.8	2.9	595.6	581.8	0.7	13.1	8.4	0.2	3.7	0.7	0.1
98HJB0023	422398	7031563	15	8.2	7.7	1.1	6.6	901.0	869.5	1.6	29.9	20.4	0.6	7.1	1.5	0.3
98HJB0024	418531	7058354	15	5.7	5.2	1.6	3.7	931.6	910.9	1.9	18.8	11.6	0.5	5.3	1.2	0.2
98HJB0025	423257	7056482	15	9.1	8.6	1.2	7.4	1024.8	999.9	3.5	21.4	16.3	0.2	3.7	0.9	0.3
98HJB0026	418755	7028843	15	3.1	2.9	0.6	2.3	591.3	581.1	1.0	9.2	5.8	0.2	2.6	0.5	0.1
98HJB0027	422606	7028339	15	9.1	8.5	1.6	6.9	1008.4	972.0	2.1	34.3	22.7	0.6	9.1	1.6	0.3
98HJB0029	422681	7049594	15	9.2	8.7	1.3	7.4	649.4	612.3	2.2	34.9	24.4	0.8	7.5	1.7	0.5
98HJB0030	418598	7054366	15	5.5	5.2	1.2	4.0	516.8	495.0	1.6	20.2	14.1	0.3	4.7	1.0	0.1
98HJB0031	413491	7043997	15	5.5	5.0	1.1	3.9	1013.2	989.0	1.0	23.2	14.6	0.5	6.8	1.2	0.1
98HJB0032	412809	7069433	15	7.0	6.5	1.7	4.9	1153.6	1127.5	2.0	24.1	15.9	0.4	6.1	1.4	0.3
98HJB0033	407376	7045260	15	6.4	5.9	1.0	4.9	645.1	621.4	1.0	22.7	14.4	1.0	6.1	1.1	0.1
98HJB0034	407894	7069212	15	6.0	5.5	1.1	4.4	622.7	594.8	2.7	25.2	16.2	1.6	6.8	0.2	0.4
98HJB0035	400803	7044763	15	5.6	5.3	0.9	4.4	771.4	749.6	1.0	20.8	13.4	0.4	5.8	1.1	0.1
98HJB0036	401945	7069741	15	7.4	6.9	1.9	5.1	1021.2	992.9	1.4	26.9	17.3	0.5	7.4	1.6	0.1
98HJB0037	403385	7039189	15	6.7	6.2	0.8	5.4	931.6	908.9	1.1	21.6	14.1	0.4	5.9	1.1	0.1
98HJB0038	402061	7065104	15	5.7	5.3	0.9	4.4	809.3	788.1	1.8	19.4	13.0	0.2	4.8	1.2	0.2
98HJB0039	407417	7038265	15	6.3	5.8	0.8	5.0	794.7	773.0	1.3	20.4	13.4	0.4	5.4	1.1	0.1
98HJB0040	407593	7064767	15	7.0	6.5	1.0	5.6	974.8	946.5	1.8	26.5	18.6	0.3	6.2	1.2	0.2
98HJB0041	412809	7037548	15	6.3	5.9	0.7	5.2	999.6	974.5	1.3	23.8	15.7	0.5	6.3	1.2	0.1

Appendix C.2
Weights of Selected Size Fractions
MacQuoid Lake area

SAMPLE NUMBER	Easting	Northing	UTM Zone	BULK SAMPLE Weight (kg, wet)				TABLE CONCENTRATE <2.0 mm, Weight (g, dry)								
									M.I. SEPARATION S.G 3.20							
											NON-MAG Fraction					
				Bulk Rec'd	Table Split	>2 mm Clasts	Table Feed	Conc. Total	M.I. Lights	MAG	Total Sieved	<0.25 mm	<0.25 mm (wash)	0.25-0.5 mm	0.5-1.0 mm	1.0-2.0 mm
98HJB0042	412548	7064445	15	5.3	5.0	0.8	4.2	739.3	719.4	1.4	18.5	12.9	0.2	4.4	0.9	0.1
98HJB0043	412869	7033494	15	6.5	6.1	1.4	4.7	727.1	707.2	1.1	18.8	11.4	0.8	5.3	1.0	0.3
98HJB0044	413437	7059994	15	5.9	5.5	0.8	4.7	1169.2	1150.8	0.9	17.5	11.2	0.3	4.9	1.0	0.1
98HJB0045	407860	7033090	15	5.4	5.5	1.0	4.5	454.2	430.8	1.1	22.3	14.4	0.7	6.1	1.0	0.1
98HJB0046	407267	7058927	15	6.0	5.5	0.7	4.8	729.8	703.7	2.1	24.0	16.2	0.3	5.9	1.4	0.2
98HJB0047	402168	7032719	15	6.3	5.9	0.7	5.2	588.2	554.5	1.3	32.4	17.6	1.2	9.7	3.4	0.5
98HJB0048	401619	7058736	15	5.6	5.2	1.0	4.2	791.6	774.4	0.9	16.3	10.7	0.2	4.5	0.8	0.1
98HJB0049	400291	7028089	15	6.3	5.7	0.9	4.8	737.3	711.5	1.6	24.2	15.6	1.0	6.1	1.2	0.3
98HJB0050	401654	7054861	15	5.8	5.4	0.9	4.6	914.5	896.7	0.8	17.0	11.5	0.3	4.4	0.8	0.0
98HJB0051	412373	7027945	15	4.8	4.4	0.7	3.7	160.3	143.8	0.7	15.8	10.7	0.5	4.0	0.5	0.1
98HJB0052	412528	7054567	15	5.0	4.5	0.8	3.7	1030.4	1012.2	0.6	17.6	11.1	0.4	5.0	1.0	0.1
98HJB0054	407057	7054690	15	1.4	1.2	0.1	1.2	234.4	227.6	0.2	6.6	5.5	0.5	0.6	0.0	0.0
98HJB0056	400698	7049064	15	5.8	5.3	0.8	4.5	1231.6	1210.8	1.3	19.5	13.1	0.3	5.1	0.9	0.1
98HJB0057	407136	7028482	15	4.7	4.4	0.9	3.5	792.4	774.0	1.0	17.4	11.5	0.4	4.4	0.9	0.2
98HJB0059	402168	7023887	15	6.4	6.0	0.9	5.1	876.2	851.2	1.7	23.3	15.9	0.8	5.1	1.1	0.4
98HJB0060	406602	7049647	15	5.6	5.2	1.0	4.2	1198.8	1179.9	0.9	18.0	11.4	0.3	5.1	1.1	0.1
98HJB0061	407683	7023737	15	6.0	5.6	0.2	5.4	617.4	604.9	0.2	12.3	9.1	1.0	2.0	0.2	0.0
98HJB0062	412375	7049466	15	5.4	5.0	0.8	4.2	779.5	758.0	1.5	20.0	13.2	0.6	5.1	1.0	0.1
98HJB0063	412251	7023229	15	5.4	5.1	1.1	4.0	433.2	413.6	0.9	18.7	11.9	0.6	5.1	0.9	0.2
98HJB0064	418933	7051031	15	5.8	5.4	0.8	4.6	947.1	929.2	1.1	16.8	11.3	0.3	4.2	0.9	0.1
98HJB0065	418035	7023054	15	6.3	5.8	0.7	5.1	612.7	586.0	1.8	24.9	16.3	0.9	6.3	1.2	0.2
98HJB0066	423071	7049574	15	4.9	4.5	0.8	3.7	717.8	701.1	1.3	15.4	10.3	0.3	3.8	0.8	0.2
98HJB0067	422728	7024351	15	6.0	5.5	0.6	4.9	776.3	755.5	1.3	19.5	12.9	0.1	5.2	1.0	0.3
98HJB0068	422455	7045231	15	5.2	4.8	0.7	4.1	1153.8	1133.6	1.4	18.8	12.9	0.3	4.5	0.9	0.2
98HJB0069	423622	7018466	15	6.3	5.9	1.0	4.9	649.7	623.2	1.8	24.7	17.5	0.4	5.6	1.0	0.2
98HJB0070	418395	7045281	15	5.8	5.3	0.6	4.7	1206.8	1184.1	1.5	21.2	14.0	0.4	5.7	1.0	0.1
98HJB0071	418034	7019288	15	6.2	5.8	1.2	4.6	752.5	725.0	2.2	25.3	16.6	0.5	6.7	1.3	0.2
98HJB0072	401934	7019946	15	3.9	3.4	1.0	2.5	684.6	670.3	1.2	13.1	7.3	0.6	4.1	0.9	0.2
98HJB0073	406756	7018591	15	6.0	5.6	1.1	4.5	455.8	435.9	2.3	17.6	11.8	0.9	4.5	0.3	0.1
98HJB0074	410839	7018659	15	5.3	4.8	1.2	3.6	689.9	666.0	2.5	21.4	14.3	1.4	5.1	0.3	0.3
98HJB0075	412588	7056979	15	5.8	5.4	0.6	4.8	660.1	640.3	2.0	17.8	12.2	0.9	4.3	0.3	0.1

Appendix C.3
Weights of Selected Size Fractions
Kimberlite Samples

Sample ID	ROCK SAMPLE Weight (g)		Weight (g) <0.25 mm	0.25 to 2 mm fraction M.I. separation 3.2 Weight (g)							
				Conc. Total	M.I. Lights	MAG	NON-MAG Fraction				
	Total as received	Crushed <2 mm					Total Sieved	< 0.25 mm	0.25-0.5 mm	0.5-1.0 mm	1.0-2.0mm
97-S-1990	809.6	790.6	168.9	621.7	621.4	0.2	0.1	0.03	0.07	-	-
98-J14	2466.2	2419.3	352.1	2067.2	2058.0	0.6	8.6	0.40	6.80	1.30	0.10

Appendix D
Sample geochemistry

Appendix D.1 Till geochemistry from the Rankin Inlet area (<0.063 mm)

Method

1) ICP-ES, following fusion and dissolution in a mixed lithium metaborate-lithium tetraborate solution:

Method ICPES-100: SiO_2, TiO_2, Al_2O_3, Fe_2O_3T, MnO, MgO, CaO, Na_2O, K_2O, P_2O_5, Ba, LOI

2) ICP-MS or -ES, after total dissolution in nitric, perchloric and hydrofluoric acids followed by a lithium metaborate fusion:

Method ICP-ES-110: Be, Co, Cr, Cu, Ni, Sc, Sr, V, Zn, Zr

Method ICP-MS-100: Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sm, Tb, Tm, Y, Yb

Method ICP-MS-110: Ag, Bi, Cd, Cs, Ga, Hf, In, Mo, Nb, Pb, Rb, Sb, Sn, Ta, Te, Th, Tl, U

Laboratory

Analytical Chemistry Laboratory at the Geological Survey of Canada

Appendix D.2 Kimberlite geochemistry

Method

1) ICP-fusion: major elements

2) ICP-multi-acid digestion: trace elements

Laboratories

S-1990: XRAL

98-J-14: Saskatchewan Research Council

Appendix D.1
Till geochemistry (<0.063 mm)
Rankin Inlet area

SAMPLE ID	EASTING	NORTHING	UTM Zone	SiO2	TiO2	Al2O3	Fe2O3T	MnO	MgO	CaO	Na2O	K2O	P2O5	Ba	LOI	Ag	Be	Bi	Cd	Co
Detection limit				*0.5*	*0.02*	*0.2*	*0.06*	*0.01*	*0.04*	*0.01*	*0.03*	*0.05*	*0.01*	*30*	*0.1*	*0.1*	*0.5*	*0.2*	*0.2*	*5*
				%	%	%	%	%	%	%	%	%	%	ppm	%	ppm	ppm	ppm	ppm	ppm
97MOB0091	569811	6969363	15	73.6	0.49	11.9	3.60	0.05	1.27	3.06	3.30	2.05	0.21	700	0.6	-0.1	1.3	-0.2	0.3	10
97MOB0092	570127	6966842	15	73.1	0.54	11.7	3.40	0.05	1.18	3.15	3.30	1.77	0.20	570	0.8	-0.1	1.3	0.4	-0.2	8
97MOB0093	570597	6965737	15	73.5	0.51	11.8	3.60	0.05	1.24	2.95	3.20	1.83	0.20	580	0.7	-0.1	1.2	0.2	-0.2	11
97MOB0094	554257	6980726	15	70.2	0.55	13.0	4.30	0.05	1.56	2.79	3.30	2.11	0.21	680	1.4	-0.1	1.3	0.3	-0.2	13
97MOB0097	554374	6981238	15	71.4	0.48	12.5	3.70	0.04	1.37	2.74	3.40	2.05	0.20	650	1.1	-0.1	1.3	-0.2	-0.2	14
97MOB0106	555057	6981065	15	72.6	0.51	12.1	3.40	0.04	1.28	2.77	3.30	2.03	0.20	670	0.9	-0.1	1.3	0.2	-0.2	11
97MOB0109	555247	6970769	15	67.9	0.55	13.1	4.50	0.05	1.73	3.11	3.30	2.18	0.22	700	2.5	-0.1	1.3	0.2	-0.2	15
97MOB0112	555555	6981484	15	72.4	0.57	12.0	3.90	0.05	1.34	2.90	3.30	1.97	0.22	680	0.8	-0.1	1.3	0.2	-0.2	14
97MOB0123	580085	6973845	15	69.1	0.57	14.1	4.40	0.05	1.69	2.87	3.50	2.08	0.20	640	1.4	-0.1	1.4	0.2	-0.2	14
97MOB0127	555566	6979063	15	69.4	0.56	13.3	4.40	0.05	1.68	2.95	3.40	2.17	0.21	690	1.0	-0.1	1.4	0.2	-0.2	15
97MOB0132	557039	6978991	15	70.6	0.57	13.1	4.00	0.05	1.60	2.90	3.30	2.05	0.22	690	1.1	-0.1	1.4	-0.2	-0.2	14
97MOB0136	557619	6980060	15	70.3	0.53	12.4	4.40	0.05	1.43	2.61	3.20	1.96	0.20	670	2.4	-0.1	1.4	0.4	0.2	15
97MOB0138	556543	6980067	15	72.3	0.50	11.9	4.10	0.05	1.55	2.63	3.00	2.12	0.17	620	1.0	-0.1	1.3	0.2	-0.2	12
97MOB0140	551738	6970515	15	75.0	0.54	11.4	3.50	0.05	1.20	2.38	3.00	1.94	0.20	540	0.8	-0.1	1.3	0.3	-0.2	13
97MOB0141	552594	6969043	15	73.4	0.51	11.2	3.90	0.05	1.28	2.61	3.10	1.96	0.19	590	1.1	-0.1	1.1	-0.2	-0.2	13
97MOB0173	551463	6976672	15	74.2	0.49	11.3	3.50	0.05	1.17	2.66	3.10	1.90	0.20	580	0.9	-0.1	1.2	-0.2	-0.2	11
97MOB0176	553872	6975040	15	76.0	0.49	10.7	3.10	0.04	0.94	2.67	3.10	1.86	0.20	560	0.5	-0.1	1.2	-0.2	-0.2	8
98MOB0001	543982	6964467	15	65.8	0.59	11.0	6.00	0.08	3.58	4.85	2.40	1.75	0.19	530	3.0	-0.1	0.9	-0.2	-0.2	25
98MOB0002	570535	6978574	15	67.1	0.54	14.2	4.30	0.06	1.69	3.24	3.60	2.09	0.19	710	2.2	-0.1	1.5	-0.2	-0.2	14
98MOB0003	571450	6977286	15	72.1	0.42	13.1	3.40	0.04	1.24	2.94	3.60	2.09	0.19	680	1.2	-0.1	1.4	-0.2	-0.2	12
98MOB0004	560196	6969611	15	76.1	0.43	10.9	3.00	0.04	0.91	2.61	3.10	1.78	0.18	570	1.1	-0.1	1.2	-0.2	-0.2	7
98MOB0005	564884	6971173	15	67.3	0.61	13.9	5.50	0.06	2.29	2.87	3.10	2.55	0.21	690	1.6	-0.1	1.4	-0.2	-0.2	14
98MOB0006	574227	6976839	15	70.1	0.57	14.0	3.80	0.05	1.41	3.15	3.70	2.07	0.22	700	0.9	-0.1	1.5	-0.2	-0.2	13
98MOB0007	576602	6975345	15	71.1	0.52	13.6	3.60	0.05	1.34	3.06	3.70	2.08	0.21	700	0.8	-0.1	1.5	0.3	0.2	13
98MOB0008	580138	6972678	15	64.1	0.57	15.6	5.50	0.06	2.42	2.90	3.30	2.72	0.21	800	3.0	-0.1	1.4	-0.2	-0.2	18
98MOB0009	580095	6977044	15	69.3	0.52	14.6	3.90	0.05	1.50	3.29	3.90	2.08	0.21	660	0.8	-0.1	1.6	-0.2	-0.2	10
98MOB0010	583769	6973432	15	67.7	0.61	14.7	4.90	0.06	1.93	2.70	3.60	2.06	0.21	620	1.5	-0.1	1.4	-0.2	-0.2	21
98MOB0011	584462	6971204	15	68.8	0.62	14.5	4.60	0.05	1.73	2.66	3.60	2.03	0.20	600	1.3	-0.1	1.4	-0.2	-0.2	16
98MOB0013	553562	6982020	15	72.3	0.55	12.6	3.60	0.04	1.39	2.81	3.40	2.09	0.20	690	1.1	-0.1	1.3	-0.2	-0.2	11
98MOB0018	553011	6979853	15	65.4	0.66	14.7	5.60	0.07	2.45	3.58	3.50	2.37	0.24	740	1.7	-0.1	1.4	0.2	-0.2	15
98MOB0021	553927	6978736	15	68.5	0.60	13.8	5.00	0.06	2.07	3.06	3.30	2.23	0.22	700	1.3	-0.1	1.3	-0.2	-0.2	13
98MOB0024	556147	6977923	15	70.1	0.46	13.2	4.50	0.05	1.84	2.71	3.30	2.11	0.18	640	1.5	-0.1	1.2	0.2	-0.2	15
98MOB0026	580133	6964959	15	73.1	0.49	12.2	3.60	0.04	1.41	2.95	3.20	2.34	0.20	720	0.8	-0.1	1.4	0.2	-0.2	11
98MOB0027	582264	6966132	15	71.2	0.59	13.1	4.30	0.05	1.60	3.07	3.30	2.15	0.22	660	0.9	-0.1	1.4	0.2	-0.2	15
98MOB0029	584152	6968751	15	68.8	0.61	12.7	4.90	0.07	1.93	4.20	3.20	1.72	0.19	580	1.7	-0.1	1.2	-0.2	-0.2	17
98MOB0030	558414	6977932	15	70.5	0.57	13.4	4.10	0.05	1.62	3.38	3.50	2.09	0.23	680	0.7	-0.1	1.4	0.5	-0.2	11
98MOB0043	532056	6958117	15	75.1	0.49	11.2	4.70	0.04	1.33	1.69	2.50	2.06	0.18	560	1.1	-0.1	1.3	0.3	-0.2	11
98MOB0044	527227	6958289	15	78.9	0.39	9.3	2.50	0.03	0.96	2.49	2.70	1.94	0.19	650	0.6	-0.1	1.2	-0.2	-0.2	6
98MOB0045	527664	6961284	15	80.1	0.41	9.4	2.40	0.03	0.81	1.88	2.40	2.05	0.17	640	0.4	-0.1	1.1	-0.2	-0.2	5
98MOB0046	528183	6965564	15	82.0	0.34	8.4	2.10	0.02	0.68	1.68	2.40	1.82	0.15	550	0.4	-0.1	1.0	-0.2	-0.2	5
98MOB0047	527851	6969083	15	79.9	0.38	9.3	2.50	0.03	0.79	2.08	2.60	2.00	0.17	520	0.4	-0.1	1.2	-0.2	-0.2	5

Appendix D.1
Till geochemistry (<0.063 mm)
Rankin Inlet area

SAMPLE ID	EASTING	NORTHING	UTM Zone	SiO2	TiO2	Al2O3	Fe2O3T	MnO	MgO	CaO	Na2O	K2O	P2O5	Ba	LOI	Ag	Be	Bi	Cd	Co
Detection limit				*0.5*	*0.02*	*0.2*	*0.06*	*0.01*	*0.04*	*0.01*	*0.03*	*0.05*	*0.01*	*30*	*0.1*	*0.1*	*0.5*	*0.2*	*0.2*	*5*
				%	%	%	%	%	%	%	%	%	%	ppm	%	ppm	ppm	ppm	ppm	ppm
98MOB0049	532018	6969229	15	78.6	0.43	10.1	2.80	0.03	0.89	2.23	2.80	1.91	0.17	510	0.5	-0.1	1.2	-0.2	-0.2	7
98MOB0050	534795	6964922	15	67.0	0.36	8.3	2.60	0.04	4.21	6.34	2.20	1.75	0.15	480	6.9	-0.1	0.8	-0.2	-0.2	8
98MOB0051	535679	6961074	15	71.6	0.49	10.7	3.90	0.04	1.84	3.93	2.60	2.06	0.18	540	2.8	-0.1	1.2	-0.2	-0.2	11
98MOB0052	536209	6968812	15	70.0	0.56	13.1	4.80	0.06	2.07	2.77	3.00	2.49	0.20	720	1.2	-0.1	1.4	-0.2	-0.2	12
98MOB0053	540038	6972710	15	78.4	0.38	9.9	2.50	0.03	0.78	2.24	2.80	1.85	0.16	530	1.0	-0.1	1.1	-0.2	-0.2	6
98MOB0055	539997	6969063	15	72.8	0.50	11.0	4.40	0.06	2.18	2.90	2.70	1.85	0.20	530	1.1	-0.1	1.2	-0.2	-0.2	18
98MOB0056	600911	6985072	15	68.4	0.63	15.0	4.10	0.06	1.41	4.24	4.10	1.94	0.26	620	0.4	-0.1	1.5	0.4	-0.2	10
98MOB0057	596718	6984591	15	68.1	0.55	15.1	4.00	0.05	1.48	3.88	4.10	2.23	0.24	670	0.5	-0.1	1.6	0.2	-0.2	10
98MOB0058	592176	6984340	15	68.1	0.56	14.9	4.10	0.05	1.49	3.82	3.90	2.24	0.23	670	0.6	-0.1	1.5	0.2	-0.2	11
98MOB0059	587964	6985169	15	68.3	0.64	14.6	4.20	0.06	1.39	3.94	4.00	2.04	0.24	600	0.5	0.1	1.5	0.3	-0.2	10
98MOB0060	583898	6984737	15	68.9	0.56	14.7	3.70	0.05	1.24	3.97	4.20	1.92	0.21	590	0.4	-0.1	1.5	-0.2	-0.2	9
98MOB0061	579476	6984781	15	67.2	0.54	15.2	4.20	0.06	1.56	3.92	4.00	2.08	0.21	630	0.7	-0.1	1.6	-0.2	-0.2	11
98MOB0062	579707	6981102	15	69.2	0.56	14.4	3.90	0.06	1.34	4.06	4.00	1.91	0.22	620	0.4	-0.1	1.5	-0.2	-0.2	9
98MOB0063	583968	6980961	15	67.0	0.59	15.3	4.40	0.06	1.70	3.73	3.90	2.17	0.22	660	0.9	-0.1	1.5	-0.2	-0.2	15
98MOB0064	588251	6981105	15	69.2	0.51	14.8	3.60	0.05	1.17	3.84	4.20	2.04	0.21	610	0.5	-0.1	1.5	-0.2	-0.2	10
98MOB0065	591750	6981047	15	69.0	0.55	14.7	4.00	0.05	1.39	3.84	4.00	2.16	0.23	650	0.5	-0.1	1.5	-0.2	-0.2	14
98MOB0066	596107	6981544	15	70.6	0.52	14.1	3.60	0.05	1.18	3.82	4.00	1.91	0.23	660	0.4	-0.1	1.5	-0.2	-0.2	8
98MOB0067	599578	6980564	15	68.7	0.53	14.6	3.90	0.05	1.33	3.85	4.10	2.02	0.22	680	0.6	-0.1	1.5	0.3	-0.2	9
98MOB0068	595605	6977008	15	64.3	0.56	15.9	5.40	0.06	2.36	3.41	3.80	2.78	0.23	810	1.2	0.1	1.4	0.3	-0.2	17
98MOB0069	592041	6977215	15	68.0	0.62	14.5	4.50	0.05	1.52	3.62	3.90	1.97	0.20	630	1.2	-0.1	1.4	-0.2	-0.2	13
98MOB0070	584488	6977228	15	69.3	0.55	14.3	3.70	0.05	1.28	3.55	3.90	1.90	0.21	630	0.8	-0.1	1.5	-0.2	-0.2	10
98MOB0071	588011	6976919	15	69.4	0.58	14.4	3.70	0.05	1.31	3.74	3.80	1.90	0.22	610	0.5	0.1	1.5	-0.2	-0.2	10
98MOB0072	587882	6973323	15	68.2	0.59	15.0	4.40	0.05	1.69	2.76	3.70	2.04	0.21	610	1.4	0.1	1.5	0.2	-0.2	20
98MOB0073	591985	6972693	15	69.4	0.60	14.4	4.00	0.05	1.41	3.13	4.00	1.81	0.21	610	0.9	-0.1	1.4	-0.2	-0.2	17
98MOB0074	579638	6968840	15	70.7	0.50	13.9	4.10	0.04	1.56	2.67	3.20	2.55	0.19	730	1.0	-0.1	1.6	-0.2	-0.2	11
98MOB0075	575627	6969116	15	72.1	0.51	12.7	3.70	0.05	1.31	2.99	3.30	2.10	0.21	730	0.8	-0.1	1.5	-0.2	-0.2	13
98MOB0076	575960	6965749	15	69.3	0.51	13.1	4.20	0.06	1.78	3.38	3.20	2.55	0.22	770	1.4	-0.1	1.4	-0.2	-0.2	10
98MOB0077	571958	6968693	15	73.3	0.50	11.9	3.60	0.05	1.31	2.84	3.20	2.13	0.21	690	0.7	-0.1	1.3	-0.2	-0.2	9
98MOB0078	568006	6969538	15	74.1	0.56	11.2	3.50	0.05	1.06	2.95	3.20	1.73	0.21	550	0.5	-0.1	1.2	-0.2	-0.2	9
98MOB0110	575976	6985100	15	68.8	0.61	14.3	4.10	0.06	1.42	4.07	3.90	1.83	0.22	590	0.6	-0.1	1.5	-0.2	-0.2	10
98MOB0111	576221	6981236	15	69.1	0.60	14.5	3.80	0.06	1.36	3.79	3.90	1.84	0.21	570	0.8	-0.1	1.6	0.2	-0.2	11
98MOB0112	575867	6977079	15	69.6	0.59	13.7	3.70	0.05	1.39	3.16	3.70	1.95	0.21	660	0.9	0.1	1.5	-0.2	-0.2	11
98MOB0113	575901	6973147	15	71.7	0.43	13.6	3.20	0.04	1.25	2.82	3.70	2.02	0.18	700	0.9	-0.1	1.4	-0.2	-0.2	11
98MOB0114	571887	6973212	15	71.1	0.48	13.5	3.50	0.04	1.30	2.92	3.60	2.04	0.20	690	0.9	-0.1	1.4	-0.2	-0.2	10
98MOB0115	571874	6980858	15	69.0	0.66	14.0	4.10	0.06	1.48	3.35	3.70	2.02	0.23	730	0.9	-0.1	1.5	-0.2	-0.2	13
98MOB0116	572106	6985012	15	66.9	0.53	15.0	4.40	0.06	1.68	3.55	3.90	2.27	0.20	710	1.2	-0.1	1.5	0.4	-0.2	16
98MOB0117	568122	6984988	15	69.5	0.47	13.9	3.50	0.04	1.22	3.74	3.80	2.03	0.20	700	0.8	-0.1	1.4	-0.2	-0.2	10
98MOB0118	567809	6981081	15	70.1	0.49	13.6	3.50	0.04	1.29	3.53	3.60	2.13	0.22	740	0.9	-0.1	1.4	-0.2	-0.2	16
98MOB0119	568282	6977314	15	72.4	0.44	12.8	3.10	0.04	1.11	3.14	3.50	1.95	0.21	670	0.6	0.2	1.4	0.2	-0.2	9
98MOB0120	568272	6973072	15	70.6	0.53	13.2	4.00	0.05	1.66	3.01	3.40	2.11	0.20	670	1.0	0.1	1.4	-0.2	-0.2	10
98MOB0121	568079	6972821	15	75.6	0.42	11.4	3.00	0.04	0.98	2.80	3.20	1.94	0.19	570	0.5	-0.1	1.2	-0.2	-0.2	7

Appendix D.1
Till geochemistry (<0.063 mm)
Rankin Inlet area

SAMPLE ID	EASTING	NORTHING	UTM Zone	SiO2	TiO2	Al2O3	Fe2O3T	MnO	MgO	CaO	Na2O	K2O	P2O5	Ba	LOI	Ag	Be	Bi	Cd	Co
Detection limit				*0.5*	*0.02*	*0.2*	*0.06*	*0.01*	*0.04*	*0.01*	*0.03*	*0.05*	*0.01*	*30*	*0.1*	*0.1*	*0.5*	*0.2*	*0.2*	*5*
				%	%	%	%	%	%	%	%	%	%	ppm	%	ppm	ppm	ppm	ppm	ppm
98MOB0122	563700	6969111	15	65.2	0.60	13.9	5.10	0.06	2.26	3.68	3.20	2.41	0.21	750	3.3	0.1	1.4	-0.2	-0.2	14
98MOB0123	564092	6976548	15	74.0	0.48	11.8	3.10	0.04	1.08	2.83	3.30	2.01	0.18	690	0.6	0.1	1.3	-0.2	-0.2	9
98MOB0124	564150	6980790	15	72.8	0.49	12.5	3.00	0.04	1.08	3.29	3.50	2.04	0.21	680	0.6	-0.1	1.3	-0.2	-0.2	9
98MOB0125	563981	6985059	15	69.2	0.49	13.9	3.60	0.04	1.25	3.70	3.90	1.98	0.21	750	1.5	0.1	1.5	0.3	-0.2	10
98MOB0126	559561	6985068	15	70.9	0.48	13.1	3.60	0.04	1.38	3.52	3.60	2.24	0.22	760	0.6	0.1	1.4	-0.2	-0.2	8
98MOB0127	559533	6981198	15	67.0	0.62	14.4	4.90	0.06	1.95	3.53	3.60	2.05	0.23	690	1.2	-0.1	1.4	-0.2	-0.2	16
98MOB0128	560092	6976843	15	75.1	0.49	11.4	3.10	0.04	1.00	2.92	3.20	1.90	0.20	640	0.4	-0.1	1.3	-0.2	-0.2	7
98MOB0129	560784	6973761	15	68.6	0.58	13.5	5.00	0.06	1.96	2.97	3.20	2.32	0.22	710	1.4	0.2	1.4	0.2	0.2	14
98MOB0130	555800	6968657	15	76.8	0.42	10.5	2.90	0.04	0.95	2.43	2.90	2.06	0.19	600	0.5	0.3	1.2	-0.2	-0.2	9
98MOB0131	555794	6973176	15	76.4	0.38	10.8	2.60	0.03	0.85	2.41	3.10	1.88	0.16	580	0.6	0.1	1.2	-0.2	-0.2	6
98MOB0132	552377	6973027	15	70.6	0.58	12.7	4.40	0.05	1.72	3.01	3.20	2.07	0.21	620	0.9	0.1	1.3	-0.2	-0.2	11
98MOB0133	547857	6972989	15	75.5	0.44	11.0	3.20	0.04	1.09	2.63	3.00	1.97	0.18	590	0.6	0.1	1.2	-0.2	-0.2	8
98MOB0134	544265	6973217	15	74.2	0.50	11.4	3.70	0.04	1.20	2.46	2.90	2.22	0.19	640	0.9	0.1	1.4	0.4	-0.2	10
98MOB0135	535905	6972991	15	77.8	0.40	10.1	2.70	0.03	0.90	2.36	2.80	1.93	0.17	540	0.5	0.1	1.1	-0.2	-0.2	7
98MOB0136	532093	6972827	15	77.3	0.37	10.3	2.70	0.03	0.92	2.46	2.90	1.84	0.16	560	0.4	0.1	1.1	-0.2	-0.2	7
98MOB0137	527924	6973006	15	78.5	0.40	9.8	2.60	0.03	0.91	2.40	2.80	1.92	0.16	540	0.3	0.2	1.1	-0.2	-0.2	6
98MOB0138	527946	6977122	15	72.9	0.56	11.8	3.90	0.05	1.49	2.90	3.00	2.15	0.22	650	0.8	0.1	1.3	-0.2	-0.2	9
98MOB0139	531983	6976819	15	77.6	0.43	10.0	2.90	0.04	0.96	2.35	2.80	1.91	0.18	520	0.5	0.4	1.1	0.3	0.3	8
98MOB0140	536001	6977170	15	76.2	0.52	10.7	3.30	0.04	1.04	2.76	3.00	1.84	0.20	550	0.4	0.2	1.2	-0.2	-0.2	8
98MOB0141	540093	6977125	15	71.0	0.65	12.3	4.60	0.06	1.83	3.17	3.10	2.19	0.22	650	1.0	0.2	1.2	-0.2	-0.2	13
98MOB0142	544031	6976990	15	76.5	0.51	10.5	3.00	0.04	0.87	2.65	3.00	1.79	0.20	510	0.4	0.3	1.2	-0.2	-0.2	8
98MOB0143	548478	6976805	15	68.6	0.60	13.4	5.30	0.06	2.23	3.05	3.10	2.18	0.20	650	1.4	0.2	1.3	-0.2	-0.2	16
98MOB0144	551896	6981068	15	66.5	0.55	15.0	5.40	0.06	2.08	2.70	3.50	2.17	0.19	690	1.5	0.2	1.4	0.5	-0.2	22
98MOB0145	555804	6984970	15	68.2	0.66	13.8	4.70	0.07	1.94	3.71	3.50	2.05	0.26	670	1.1	0.2	1.4	-0.2	-0.2	13
98MOB0146	551904	6984968	15	73.8	0.51	12.0	3.40	0.04	1.22	3.22	3.40	2.03	0.23	670	0.5	0.3	1.3	-0.2	-0.2	8
98MOB0147	547922	6984907	15	69.4	0.61	13.6	4.50	0.06	1.81	2.92	3.40	2.13	0.21	700	1.2	0.1	1.4	-0.2	-0.2	16
98MOB0148	544163	6984978	15	67.2	0.64	12.6	5.70	0.07	2.17	4.12	3.00	1.84	0.18	560	2.8	0.3	1.1	-0.2	-0.2	21
98MOB0149	539997	6984955	15	71.6	0.55	12.2	4.50	0.05	1.62	2.86	3.10	2.04	0.19	600	1.4	0.2	1.2	-0.2	-0.2	15
98MOB0150	536058	6984785	15	70.5	0.58	12.7	4.90	0.06	1.87	2.77	3.00	1.94	0.18	600	1.7	0.2	1.2	-0.2	-0.2	19
98MOB0151	532030	6984991	15	73.0	0.53	12.3	3.60	0.05	1.41	2.73	3.20	1.88	0.18	570	0.9	0.2	1.3	-0.2	-0.2	11
98MOB0152	528064	6984644	15	72.8	0.61	12.8	4.00	0.05	1.43	2.60	2.90	2.22	0.21	640	1.0	0.1	1.3	-0.2	0.5	11
98MOB0153	528227	6980498	15	76.2	0.50	11.1	2.70	0.04	1.13	2.51	2.90	1.95	0.20	540	0.6	-0.1	1.2	0.2	-0.2	11
98MOB0154	532070	6980936	15	76.7	0.42	10.8	3.20	0.04	1.10	2.49	2.90	1.95	0.17	550	0.7	0.2	1.2	-0.2	-0.2	7
98MOB0155	536044	6980916	15	76.2	0.50	11.2	3.00	0.04	0.94	2.68	3.20	1.76	0.18	530	0.6	-0.1	1.2	-0.2	-0.2	8
98MOB0156	540003	6980993	15	74.5	0.51	11.7	3.60	0.05	1.24	2.67	3.10	1.95	0.19	580	0.8	0.1	1.2	-0.2	-0.2	12
98MOB0157	544104	6981015	15	71.6	0.58	12.6	5.10	0.05	1.65	2.68	3.10	1.95	0.19	590	1.2	0.2	1.2	0.2	-0.2	14

Appendix D.1
Till geochemistry (<0.063 mm)
Rankin Inlet area

SAMPLE ID	Cr	Cs	Cu	Ga	Hf	In	Mo	Nb	Ni	Pb	Rb	Sb	Sc	Sn	Sr	Ta	Te	Th	Tl	U
Detection limit	*10 ppm*	*0.02 ppm*	*10 ppm*	*0.1 ppm*	*0.05 ppm*	*0.05 ppm*	*0.2 ppm*	*0.05 ppm*	*10 ppm*	*2 ppm*	*0.05 ppm*	*0.2 ppm*	*0.5 ppm*	*0.5 ppm*	*10 ppm*	*0.05 ppm*	*0.2 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*
97MOB0091	61	1.10	25	14.0	8.10	0.11	0.9	8.80	26	16	60.00	-0.2	9.1	1.1	390	0.63	-0.2	6.20	0.47	1.80
97MOB0092	56	1.00	18	14.0	9.60	-0.05	0.4	9.20	20	16	51.00	-0.2	9.1	1.0	390	0.67	-0.2	6.00	0.39	1.80
97MOB0093	54	1.30	31	14.0	8.20	-0.05	0.3	8.60	24	16	55.00	-0.2	9.0	1.0	420	0.60	-0.2	6.20	0.40	2.00
97MOB0094	80	1.80	29	17.0	7.10	-0.05	0.4	8.90	37	17	66.00	-0.2	10.0	1.2	390	0.67	-0.2	7.80	0.47	1.70
97MOB0097	75	1.50	36	16.0	7.00	-0.05	0.4	8.40	39	19	64.00	-0.2	9.4	1.1	410	0.60	-0.2	6.50	0.49	1.70
97MOB0106	70	1.40	37	15.0	7.90	-0.05	0.4	8.60	34	17	62.00	-0.2	9.2	1.5	400	0.60	-0.2	6.90	0.49	1.90
97MOB0109	85	2.10	54	17.0	7.80	-0.05	0.7	9.40	48	18	72.00	-0.2	11.0	1.7	410	0.89	-0.2	9.00	0.56	2.20
97MOB0112	73	1.20	31	14.0	9.20	-0.05	0.3	9.50	31	18	58.00	-0.2	10.0	1.3	400	0.71	-0.2	7.20	0.45	2.00
97MOB0123	84	2.00	50	17.0	6.30	-0.05	0.9	8.00	58	19	63.00	-0.2	11.0	1.0	400	0.61	-0.2	9.30	0.50	1.90
97MOB0127	85	1.80	45	17.0	7.30	-0.05	0.6	9.10	44	19	67.00	-0.2	11.0	1.5	410	0.67	-0.2	8.90	0.55	2.40
97MOB0132	85	1.60	34	16.0	7.90	-0.05	0.7	8.70	41	16	61.00	-0.2	11.0	1.1	410	0.63	-0.2	6.70	0.46	2.20
97MOB0136	77	1.80	24	15.0	7.40	0.23	0.6	8.80	33	18	60.00	-0.2	9.5	1.4	390	0.70	-0.2	7.60	0.46	1.90
97MOB0138	68	2.20	37	15.0	7.00	-0.05	0.5	8.60	30	15	69.00	-0.2	10.0	1.3	380	0.63	-0.2	7.80	0.52	2.20
97MOB0140	58	1.50	31	13.0	7.30	-0.05	0.4	8.30	29	15	58.00	0.2	8.6	0.9	360	0.61	-0.2	5.60	0.43	1.50
97MOB0141	66	1.30	40	13.0	7.60	-0.05	0.4	8.30	32	16	52.00	-0.2	10.0	0.9	400	0.61	-0.2	6.30	0.48	1.40
97MOB0173	56	1.30	29	13.0	7.90	-0.05	0.4	8.70	28	16	50.00	-0.2	8.9	1.1	390	0.62	-0.2	6.40	0.45	1.80
97MOB0176	49	0.93	15	12.0	9.00	-0.05	-0.2	9.10	18	15	53.00	-0.2	8.1	1.1	400	0.65	-0.2	6.10	0.41	1.70
98MOB0001	167	2.00	64	14.0	5.40	-0.05	0.6	7.70	67	13	51.00	0.2	17.0	1.0	310	0.58	-0.2	6.40	0.48	2.10
98MOB0002	79	2.20	28	18.0	7.30	-0.05	0.5	8.50	35	22	65.00	-0.2	11.0	1.1	430	0.65	-0.2	8.90	0.49	2.10
98MOB0003	64	1.60	27	16.0	6.40	-0.05	0.5	7.70	33	20	64.00	-0.2	8.1	1.2	430	0.53	-0.2	5.70	0.46	1.50
98MOB0004	45	1.10	18	13.0	7.90	-0.05	0.4	8.00	16	16	53.00	-0.2	7.3	0.8	390	0.60	-0.2	5.70	0.39	1.50
98MOB0005	105	3.20	38	18.0	6.20	-0.05	0.8	10.00	46	17	72.00	-0.2	13.0	1.3	410	0.71	-0.2	11.00	0.56	2.10
98MOB0006	74	1.90	39	16.0	7.80	-0.05	0.6	9.30	40	20	62.00	-0.2	10.0	1.1	450	0.73	-0.2	6.60	0.48	2.10
98MOB0007	71	1.70	36	16.0	7.40	0.19	0.4	8.50	39	21	61.00	-0.2	9.3	1.6	450	0.66	-0.2	6.60	0.48	1.80
98MOB0008	116	3.50	40	21.0	5.40	-0.05	2.3	8.90	58	21	81.00	-0.2	13.0	2.6	430	0.68	-0.2	11.00	0.69	2.60
98MOB0009	73	1.90	38	17.0	6.40	-0.05	1.1	7.80	42	19	64.00	-0.2	9.4	1.2	450	0.67	-0.2	6.80	0.48	2.70
98MOB0010	97	2.10	58	18.0	6.60	-0.05	0.8	9.00	65	30	67.00	-0.2	12.0	1.4	400	0.63	-0.2	6.90	0.49	1.60
98MOB0011	91	1.80	48	17.0	6.40	-0.05	1.4	8.80	45	19	63.00	-0.2	12.0	2.5	400	0.65	-0.2	7.70	0.46	2.30
98MOB0013	76	1.50	30	15.0	7.70	-0.05	0.5	9.10	34	19	61.00	-0.2	10.0	2.5	400	0.65	-0.2	6.60	0.45	1.60
98MOB0018	99	2.50	36	20.0	6.40	-0.05	0.5	10.00	47	19	80.00	-0.2	14.0	1.6	420	0.69	-0.2	12.00	0.52	2.10
98MOB0021	100	2.20	44	17.0	7.00	-0.05	0.5	9.10	43	19	69.00	-0.2	13.0	2.8	400	0.64	-0.2	8.70	0.47	1.60
98MOB0024	81	2.20	48	16.0	5.00	-0.05	0.5	7.20	50	20	68.00	-0.2	10.0	2.3	370	0.52	-0.2	7.00	0.47	1.60
98MOB0026	62	1.70	28	15.0	7.60	-0.05	0.6	9.20	31	18	74.00	-0.2	8.6	2.2	380	0.69	-0.2	8.30	0.55	1.60
98MOB0027	72	1.90	31	17.0	8.60	-0.05	0.4	9.80	35	18	71.00	-0.2	10.0	1.5	390	0.74	-0.2	9.20	0.49	2.00
98MOB0029	84	1.10	44	15.0	7.50	-0.05	0.3	8.20	43	16	53.00	0.2	13.0	1.4	370	0.61	-0.2	6.50	0.38	1.80
98MOB0030	77	1.50	20	17.0	8.20	0.21	0.5	9.70	29	17	67.00	-0.2	11.0	1.5	420	0.69	-0.2	7.70	0.45	1.90
98MOB0043	66	1.90	28	14.0	5.70	-0.05	0.2	8.20	33	14	72.00	0.2	8.7	1.1	310	0.60	-0.2	6.50	0.46	1.60
98MOB0044	37	1.00	13	11.0	7.30	-0.05	0.4	8.20	16	15	61.00	-0.2	5.9	1.5	400	0.59	-0.2	6.30	0.45	1.30
98MOB0045	33	1.20	11	11.0	8.30	-0.05	0.3	9.00	11	14	64.00	-0.2	5.9	0.8	350	0.70	-0.2	6.90	0.44	1.70
98MOB0046	32	1.00	-10	9.6	7.00	-0.05	0.2	7.80	11	14	58.00	-0.2	4.9	0.8	310	0.60	-0.2	5.90	0.39	1.30
98MOB0047	35	1.20	-10	11.0	8.10	-0.05	0.4	9.40	13	16	68.00	-0.2	5.8	3.2	350	0.70	-0.2	7.90	0.44	1.70

Appendix D.1
Till geochemistry (<0.063 mm)
Rankin Inlet area

SAMPLE ID	Cr	Cs	Cu	Ga	Hf	In	Mo	Nb	Ni	Pb	Rb	Sb	Sc	Sn	Sr	Ta	Te	Th	Tl	U
Detection limit	*10 ppm*	*0.02 ppm*	*10 ppm*	*0.1 ppm*	*0.05 ppm*	*0.05 ppm*	*0.2 ppm*	*0.05 ppm*	*10 ppm*	*2 ppm*	*0.05 ppm*	*0.2 ppm*	*0.5 ppm*	*0.5 ppm*	*10 ppm*	*0.05 ppm*	*0.2 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*
98MOB0049	40	1.20	17	12.0	8.20	-0.05	0.2	8.80	16	16	65.00	-0.2	6.6	1.1	350	0.70	-0.2	7.70	0.40	1.90
98MOB0050	45	1.20	21	9.8	5.70	-0.05	-0.2	7.00	18	14	56.00	0.3	6.1	0.8	300	0.57	-0.2	5.50	0.41	1.20
98MOB0051	73	1.90	26	13.0	6.10	-0.05	0.6	8.60	29	16	72.00	0.3	10.0	1.6	390	0.63	-0.2	8.10	0.53	1.70
98MOB0052	82	2.80	28	17.0	6.00	-0.05	0.8	10.00	36	18	92.00	-0.2	11.0	2.7	380	0.73	-0.2	13.00	0.59	2.40
98MOB0053	37	1.00	10	11.0	7.10	-0.05	-0.2	7.90	13	15	58.00	-0.2	6.2	1.1	340	0.62	-0.2	5.70	0.45	1.40
98MOB0055	173	1.80	56	13.0	7.00	-0.05	0.3	8.00	53	16	63.00	0.3	11.0	1.6	350	0.67	-0.2	7.80	0.51	1.60
98MOB0056	51	0.87	16	18.0	9.00	0.18	0.6	9.30	20	18	56.00	-0.2	10.0	1.8	450	0.66	-0.2	9.10	0.40	2.30
98MOB0057	55	1.20	23	19.0	8.30	-0.05	1.0	8.90	23	20	68.00	-0.2	10.0	2.3	420	0.67	-0.2	9.70	0.44	2.90
98MOB0058	59	1.40	20	19.0	8.30	-0.05	0.4	9.30	25	19	68.00	-0.2	11.0	1.5	420	0.69	-0.2	9.40	0.49	2.20
98MOB0059	51	1.20	24	18.0	11.00	-0.05	0.9	9.90	23	20	63.00	-0.2	11.0	1.7	420	0.73	-0.2	9.70	0.46	4.30
98MOB0060	45	0.93	14	18.0	12.00	-0.05	0.6	8.60	19	19	55.00	-0.2	10.0	1.2	440	0.66	-0.2	7.20	0.38	2.40
98MOB0061	59	1.30	25	19.0	6.20	-0.05	0.3	8.30	27	19	64.00	-0.2	11.0	1.3	420	0.65	-0.2	6.60	0.44	2.80
98MOB0062	58	1.00	23	17.0	8.40	-0.05	0.8	8.40	26	19	56.00	-0.2	10.0	1.5	450	0.66	-0.2	7.10	0.46	1.90
98MOB0063	73	1.80	34	19.0	7.40	-0.05	0.8	9.20	38	19	69.00	-0.2	12.0	2.2	430	0.69	-0.2	7.30	0.48	2.40
98MOB0064	40	1.00	21	18.0	7.70	-0.05	0.3	8.70	19	19	59.00	-0.2	9.4	1.5	440	0.66	-0.2	6.90	0.43	2.20
98MOB0065	49	1.30	24	18.0	8.50	-0.05	0.9	9.10	24	20	66.00	-0.2	10.0	1.3	430	0.68	-0.2	8.50	0.48	2.80
98MOB0066	43	0.87	17	17.0	8.60	-0.05	0.3	9.00	19	19	56.00	-0.2	8.7	2.7	440	0.64	-0.2	7.50	0.37	2.20
98MOB0067	49	1.20	24	18.0	8.20	0.07	0.9	9.10	22	19	61.00	-0.2	9.3	4.6	440	0.68	-0.2	8.00	0.45	2.30
98MOB0068	78	3.10	32	22.0	4.90	0.16	0.8	8.90	43	18	97.00	-0.2	11.0	1.6	420	0.68	-0.2	7.70	0.68	2.30
98MOB0069	60	1.60	45	18.0	8.20	-0.05	0.7	8.80	37	18	61.00	-0.2	10.0	1.3	450	0.69	-0.2	7.80	0.48	2.70
98MOB0070	57	1.20	32	17.0	8.00	-0.05	0.7	8.10	28	18	55.00	-0.2	10.0	1.1	450	0.63	-0.2	6.90	0.42	2.40
98MOB0071	57	1.10	26	17.0	8.70	-0.05	0.5	8.30	28	21	54.00	-0.2	10.0	1.4	470	0.64	-0.2	6.60	0.41	2.20
98MOB0072	86	1.90	47	18.0	6.30	-0.05	0.8	8.20	59	18	63.00	-0.2	11.0	1.0	420	0.59	-0.2	6.20	0.47	2.10
98MOB0073	67	1.30	37	17.0	6.80	-0.05	0.5	8.10	41	18	54.00	-0.2	10.0	1.1	430	0.61	-0.2	5.40	0.42	1.90
98MOB0074	67	2.30	33	17.0	6.80	-0.05	0.7	9.70	33	21	85.00	-0.2	10.0	1.7	380	0.77	-0.2	9.20	0.61	2.50
98MOB0075	66	1.50	35	15.0	8.30	-0.05	0.5	9.10	34	20	65.00	-0.2	9.1	2.9	400	0.66	-0.2	7.40	0.51	1.80
98MOB0076	77	2.10	22	17.0	6.10	-0.05	0.6	9.70	30	17	80.00	-0.2	11.0	1.3	390	0.69	-0.2	8.30	0.57	2.10
98MOB0077	60	1.50	28	14.0	8.00	-0.05	0.5	9.20	27	18	67.00	-0.2	9.3	1.6	370	0.69	-0.2	8.30	0.52	1.80
98MOB0078	52	0.92	21	13.0	10.00	-0.05	0.4	9.30	20	17	51.00	-0.2	8.9	2.8	420	0.68	-0.2	6.10	0.38	1.80
98MOB0110	57	1.10	26	17.0	8.30	-0.05	0.3	8.60	26	18	53.00	-0.2	11.0	1.6	450	0.70	-0.2	6.70	0.40	2.50
98MOB0111	61	1.50	27	17.0	8.60	0.07	0.6	8.50	30	19	57.00	-0.2	10.0	1.3	460	0.72	-0.2	6.50	0.42	2.70
98MOB0112	72	1.70	25	16.0	9.10	-0.05	0.5	9.00	30	20	60.00	-0.2	10.0	1.3	460	0.68	-0.2	6.80	0.43	2.10
98MOB0113	64	1.30	30	15.0	5.40	-0.05	0.5	7.00	34	19	59.00	-0.2	8.4	1.1	440	0.50	-0.2	4.90	0.45	1.60
98MOB0114	68	1.20	35	16.0	7.40	-0.05	0.8	7.80	36	19	60.00	-0.2	8.9	0.8	430	0.57	-0.2	7.60	0.47	2.00
98MOB0115	76	1.90	29	17.0	10.00	-0.05	1.0	10.00	34	27	64.00	-0.2	11.0	3.5	460	0.76	-0.2	8.10	0.47	2.50
98MOB0116	74	2.60	44	19.0	6.40	-0.05	0.9	8.80	50	22	79.00	-0.2	11.0	2.6	430	0.81	-0.2	8.00	0.61	2.90
98MOB0117	55	1.10	29	16.0	8.00	-0.05	0.4	8.10	25	20	59.00	-0.2	8.6	1.1	490	0.60	-0.2	6.80	0.48	2.00
98MOB0118	61	1.20	26	16.0	8.80	-0.05	0.6	9.00	30	20	61.00	-0.2	9.0	1.5	460	0.67	-0.2	7.20	0.49	1.90
98MOB0119	56	0.98	18	15.0	8.10	-0.05	0.6	8.00	24	21	57.00	-0.2	7.8	1.4	450	0.61	-0.2	5.70	0.43	1.70
98MOB0120	80	1.80	14	17.0	6.70	0.09	0.5	8.60	29	17	69.00	-0.2	10.0	1.3	400	0.59	-0.2	6.70	0.46	1.70
98MOB0121	46	1.10	20	13.0	8.00	-0.05	0.4	8.10	19	16	59.00	-0.2	7.5	1.7	360	0.63	-0.2	6.00	0.45	1.50

Appendix D.1
Till geochemistry (<0.063 mm)
Rankin Inlet area

SAMPLE ID	Cr	Cs	Cu	Ga	Hf	In	Mo	Nb	Ni	Pb	Rb	Sb	Sc	Sn	Sr	Ta	Te	Th	Tl	U
Detection limit	*10 ppm*	*0.02 ppm*	*10 ppm*	*0.1 ppm*	*0.05 ppm*	*0.05 ppm*	*0.2 ppm*	*0.05 ppm*	*10 ppm*	*2 ppm*	*0.05 ppm*	*0.2 ppm*	*0.5 ppm*	*0.5 ppm*	*10 ppm*	*0.05 ppm*	*0.2 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*
98MOB0122	93	2.80	36	18.0	7.20	-0.05	0.8	9.70	42	20	85.00	-0.2	12.0	2.5	410	0.73	-0.2	13.00	0.59	2.10
98MOB0123	56	1.00	14	14.0	9.00	-0.05	0.3	9.00	21	18	60.00	-0.2	8.2	0.9	400	0.66	-0.2	7.00	0.43	1.90
98MOB0124	54	0.82	12	15.0	10.00	-0.05	0.4	9.20	20	19	58.00	-0.2	8.1	1.5	450	0.65	-0.2	6.60	0.41	1.80
98MOB0125	53	1.10	28	17.0	7.50	-0.05	0.6	8.40	24	19	57.00	-0.2	8.8	1.0	480	0.64	-0.2	6.60	0.41	1.80
98MOB0126	57	1.20	31	16.0	8.20	-0.05	0.4	9.50	25	20	68.00	-0.2	9.0	1.6	450	0.74	-0.2	7.80	0.56	1.70
98MOB0127	91	1.80	27	18.0	8.30	-0.05	0.6	9.00	40	18	65.00	-0.2	12.0	1.3	450	0.67	-0.2	7.30	0.46	2.00
98MOB0128	51	0.88	22	13.0	9.40	-0.05	0.4	9.20	20	17	56.00	-0.2	8.1	1.1	390	0.69	-0.2	6.40	0.43	1.80
98MOB0129	92	2.50	48	17.0	7.30	0.07	0.6	9.50	46	19	77.00	-0.2	12.0	1.9	420	0.77	-0.2	10.00	0.57	2.20
98MOB0130	44	1.30	22	12.0	7.60	-0.05	0.3	8.40	22	16	65.00	-0.2	7.3	1.1	380	0.65	-0.2	6.30	0.49	1.50
98MOB0131	40	1.00	14	12.0	5.80	0.05	0.3	7.10	17	15	56.00	-0.2	6.9	2.5	390	0.57	-0.2	4.80	0.42	1.30
98MOB0132	80	1.90	23	16.0	7.70	-0.05	0.4	9.20	33	15	68.00	-0.2	12.0	1.1	390	0.69	-0.2	7.50	0.50	1.90
98MOB0133	46	1.30	23	13.0	6.50	-0.05	0.4	8.10	22	16	62.00	-0.2	8.3	0.9	370	0.64	-0.2	6.10	0.46	1.50
98MOB0134	49	2.00	24	14.0	8.30	0.05	0.7	11.00	23	20	72.00	-0.2	8.8	1.6	360	0.85	-0.2	8.40	0.54	2.40
98MOB0135	37	1.20	18	12.0	6.90	-0.05	0.3	8.20	16	15	64.00	-0.2	6.8	1.1	350	0.67	-0.2	6.80	0.52	1.60
98MOB0136	38	1.20	15	12.0	5.80	-0.05	0.4	7.30	17	15	60.00	-0.2	6.7	0.7	370	0.63	-0.2	5.50	0.47	1.50
98MOB0137	36	1.20	10	12.0	7.20	0.05	0.3	9.20	13	15	67.00	-0.2	6.6	1.1	360	0.77	-0.2	7.00	0.45	1.60
98MOB0138	59	2.00	21	15.0	8.20	0.07	0.6	11.00	25	18	78.00	-0.2	10.0	1.2	390	0.99	-0.2	13.00	0.58	2.50
98MOB0139	42	1.50	23	12.0	7.60	0.26	0.8	9.10	19	21	68.00	-0.2	7.3	1.3	340	0.71	-0.2	9.20	0.50	2.30
98MOB0140	47	1.10	21	12.0	9.00	0.08	0.4	9.90	20	17	58.00	-0.2	8.6	1.3	380	0.91	-0.2	8.10	0.44	2.00
98MOB0141	75	2.10	29	15.0	8.10	-0.05	0.3	10.00	37	16	71.00	-0.2	12.0	1.5	390	0.80	-0.2	9.50	0.53	2.10
98MOB0142	45	0.94	47	12.0	9.70	0.06	0.3	9.60	18	23	54.00	-0.2	8.0	1.1	390	0.81	-0.2	6.70	0.41	1.80
98MOB0143	96	2.20	39	17.0	6.30	0.06	0.5	8.80	46	16	75.00	-0.2	14.0	1.2	390	0.67	-0.2	8.80	0.56	1.70
98MOB0144	110	2.10	76	18.0	4.90	-0.05	0.9	7.70	75	20	66.00	0.2	13.0	1.1	410	0.56	-0.2	9.50	0.51	2.10
98MOB0145	164	1.60	20	17.0	9.10	-0.05	0.7	10.00	36	19	64.00	-0.2	12.0	1.2	420	0.79	-0.2	8.10	0.49	2.20
98MOB0146	62	0.93	13	14.0	10.00	0.05	0.4	9.70	20	18	59.00	-0.2	8.9	1.3	400	0.77	-0.2	6.60	0.49	1.80
98MOB0147	93	1.70	38	18.0	7.50	0.05	0.6	9.10	44	18	67.00	-0.2	12.0	1.2	390	0.71	-0.2	7.10	0.49	1.90
98MOB0148	103	1.50	73	16.0	6.40	0.06	0.7	8.20	59	17	59.00	0.3	15.0	1.0	370	0.65	-0.2	6.40	0.47	1.60
98MOB0149	81	1.50	47	15.0	7.00	-0.05	0.5	8.60	45	17	63.00	0.2	12.0	0.9	380	0.65	-0.2	6.80	0.49	1.50
98MOB0150	90	1.80	60	15.0	6.70	0.06	0.7	8.60	55	17	64.00	0.3	13.0	2.8	360	0.68	-0.2	6.90	0.53	1.70
98MOB0151	72	1.30	31	14.0	6.60	0.08	0.5	8.20	35	17	58.00	0.2	11.0	2.2	400	0.62	-0.2	6.00	0.44	1.60
98MOB0152	63	2.10	22	15.0	8.00	-0.05	0.3	11.00	27	18	72.00	-0.2	11.0	1.8	360	0.84	-0.2	11.00	0.47	2.30
98MOB0153	48	1.60	21	13.0	7.70	-0.05	0.7	9.20	23	16	65.00	-0.2	8.4	0.9	340	0.81	-0.2	9.70	0.50	2.60
98MOB0154	48	1.50	32	13.0	6.60	-0.05	0.5	7.90	26	20	64.00	-0.2	7.9	4.5	350	0.62	-0.2	7.30	0.50	1.60
98MOB0155	48	0.91	17	12.0	7.70	-0.05	0.3	8.70	21	16	52.00	-0.2	8.1	0.8	370	0.74	-0.2	5.70	0.40	1.60
98MOB0156	59	1.40	35	13.0	7.20	-0.05	0.4	8.40	31	17	61.00	-0.2	10.0	0.9	390	0.68	-0.2	6.90	0.52	1.40
98MOB0157	76	1.70	52	15.0	6.90	0.07	0.5	8.60	44	17	61.00	-0.2	12.0	1.1	380	0.67	-0.2	6.80	0.47	1.50

Appendix D.1
Till geochemistry (<0.063 mm)
Rankin Inlet area

SAMPLE ID	V	Zn	Zr	Ce	Dy	Er	Eu	Gd	Ho	La	Lu	Nd	Pr	Sm	Tb	Tm	Y	Yb
Detection limit	*5 ppm*	*5 ppm*	*10 ppm*	*0.1 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.1 ppm*	*0.02 ppm*	*0.1 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.05 ppm*
97MOB0091	58	28	290	62.0	3.20	1.70	1.20	4.10	0.61	34.0	0.29	31.0	8.30	5.10	0.61	0.25	20.00	1.70
97MOB0092	56	29	340	62.0	3.60	1.90	1.20	4.20	0.71	31.0	0.33	29.0	7.80	5.00	0.63	0.31	22.00	2.00
97MOB0093	56	30	290	56.0	3.40	1.80	1.20	4.00	0.65	29.0	0.29	27.0	7.20	4.80	0.61	0.28	21.00	1.80
97MOB0094	69	42	250	65.0	3.00	1.60	1.30	4.10	0.60	32.0	0.28	30.0	7.80	5.00	0.59	0.26	18.00	1.70
97MOB0097	63	37	240	69.0	3.20	1.70	1.40	4.30	0.63	34.0	0.26	33.0	8.60	5.60	0.61	0.26	19.00	1.70
97MOB0106	60	34	290	70.0	3.40	1.80	1.30	4.30	0.62	33.0	0.28	32.0	8.50	5.50	0.62	0.27	20.00	1.80
97MOB0109	74	48	280	71.0	3.60	1.80	1.40	4.60	0.69	38.0	0.32	35.0	9.20	5.90	0.65	0.29	22.00	1.80
97MOB0112	64	34	330	68.0	3.60	2.00	1.40	4.50	0.70	36.0	0.31	32.0	8.80	5.80	0.67	0.30	21.00	2.00
97MOB0123	74	52	210	57.0	3.10	1.60	1.20	3.70	0.57	28.0	0.28	26.0	7.00	4.70	0.55	0.25	18.00	1.60
97MOB0127	73	49	260	65.0	3.50	1.90	1.40	4.60	0.69	37.0	0.31	34.0	9.00	6.10	0.66	0.30	22.00	1.90
97MOB0132	70	42	290	68.0	3.30	1.70	1.30	4.30	0.64	35.0	0.28	33.0	8.80	5.70	0.61	0.26	19.00	1.70
97MOB0136	66	42	270	77.0	3.20	1.70	1.30	4.00	0.61	35.0	0.27	30.0	8.10	5.10	0.57	0.27	19.00	1.70
97MOB0138	66	40	250	60.0	3.20	1.70	1.10	4.00	0.62	31.0	0.28	27.0	7.40	4.90	0.58	0.26	19.00	1.70
97MOB0140	56	32	250	52.0	3.10	1.70	1.10	3.70	0.59	27.0	0.27	25.0	6.60	4.40	0.56	0.25	18.00	1.60
97MOB0141	63	36	270	55.0	3.20	1.70	1.10	3.80	0.63	27.0	0.28	25.0	6.60	4.60	0.56	0.26	19.00	1.70
97MOB0173	56	32	290	58.0	3.20	1.90	1.20	4.00	0.62	31.0	0.29	29.0	7.50	4.90	0.56	0.26	20.00	1.70
97MOB0176	50	24	320	54.0	3.30	1.80	1.10	4.00	0.61	27.0	0.29	26.0	6.70	4.60	0.55	0.29	20.00	1.80
98MOB0001	112	51	180	52.0	3.20	1.70	1.10	3.70	0.60	26.0	0.27	24.0	6.40	4.30	0.55	0.27	18.00	1.60
98MOB0002	74	53	250	87.0	3.50	1.90	1.60	5.00	0.68	42.0	0.30	38.0	10.00	6.60	0.69	0.28	20.00	1.80
98MOB0003	56	41	260	59.0	2.70	1.40	1.20	3.50	0.52	25.0	0.22	25.0	6.40	4.50	0.51	0.21	16.00	1.40
98MOB0004	46	34	290	60.0	3.00	1.60	1.20	3.80	0.59	30.0	0.29	26.0	7.00	4.70	0.55	0.25	18.00	1.70
98MOB0005	91	63	220	73.0	3.50	1.80	1.40	4.80	0.68	40.0	0.29	34.0	9.10	6.00	0.65	0.28	20.00	1.90
98MOB0006	66	43	290	61.0	3.30	1.70	1.40	4.30	0.62	32.0	0.30	30.0	8.00	5.70	0.60	0.27	19.00	1.80
98MOB0007	62	38	270	59.0	3.20	1.70	1.40	4.30	0.61	30.0	0.27	29.0	7.60	5.40	0.59	0.25	18.00	1.80
98MOB0008	99	70	190	79.0	3.20	1.60	1.40	4.40	0.62	39.0	0.25	35.0	9.20	6.00	0.59	0.24	19.00	1.60
98MOB0009	64	48	230	49.0	2.90	1.50	1.30	3.70	0.57	28.0	0.26	26.0	7.00	4.90	0.53	0.24	18.00	1.70
98MOB0010	85	59	230	57.0	3.10	1.70	1.30	3.80	0.64	28.0	0.29	26.0	6.80	4.90	0.57	0.27	19.00	1.80
98MOB0011	80	54	240	54.0	3.00	1.60	1.30	3.60	0.60	26.0	0.26	26.0	6.80	4.80	0.53	0.26	18.00	1.70
98MOB0013	62	51	300	58.0	3.10	1.70	1.30	4.00	0.60	29.0	0.27	28.0	7.10	5.10	0.57	0.25	19.00	1.70
98MOB0018	96	66	230	84.0	3.80	2.00	1.60	5.30	0.72	46.0	0.30	39.0	11.00	7.10	0.70	0.30	22.00	2.00
98MOB0021	87	56	260	66.0	3.40	1.80	1.40	4.30	0.63	33.0	0.27	30.0	8.00	5.60	0.61	0.27	20.00	1.80
98MOB0024	69	51	170	69.0	2.90	1.50	1.40	4.20	0.56	36.0	0.24	32.0	8.60	5.40	0.56	0.23	17.00	1.50
98MOB0026	55	37	280	66.0	3.40	1.80	1.30	4.30	0.63	33.0	0.30	29.0	7.80	5.40	0.60	0.28	20.00	1.80
98MOB0027	68	43	320	71.0	3.60	1.90	1.40	4.60	0.70	34.0	0.29	31.0	8.20	5.80	0.62	0.28	21.00	2.00
98MOB0029	91	46	270	54.0	3.70	2.00	1.30	4.20	0.71	26.0	0.31	25.0	6.60	5.20	0.62	0.30	21.00	2.00
98MOB0030	71	42	300	68.0	3.50	1.80	1.50	4.70	0.68	35.0	0.30	32.0	8.50	6.10	0.64	0.28	21.00	2.00
98MOB0043	60	35	200	49.0	2.70	1.50	1.10	3.20	0.51	25.0	0.23	22.0	5.80	4.20	0.48	0.23	17.00	1.50
98MOB0044	39	23	270	56.0	2.50	1.30	1.10	3.50	0.47	28.0	0.21	26.0	6.80	4.80	0.46	0.19	15.00	1.40
98MOB0045	39	19	320	52.0	2.90	1.50	1.00	3.40	0.58	25.0	0.26	23.0	6.10	4.50	0.50	0.26	18.00	1.80
98MOB0046	33	15	270	51.0	2.20	1.20	0.88	3.00	0.42	25.0	0.20	21.0	5.70	3.80	0.41	0.18	13.00	1.20
98MOB0047	38	21	300	54.0	2.60	1.30	0.96	3.20	0.50	26.0	0.23	22.0	6.10	4.10	0.46	0.20	15.00	1.50

Appendix D.1
Till geochemistry (<0.063 mm)
Rankin Inlet area

SAMPLE ID	V	Zn	Zr	Ce	Dy	Er	Eu	Gd	Ho	La	Lu	Nd	Pr	Sm	Tb	Tm	Y	Yb
Detection limit	*5 ppm*	*5 ppm*	*10 ppm*	*0.1 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.1 ppm*	*0.02 ppm*	*0.1 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.05 ppm*
98MOB0049	44	24	310	50.0	2.80	1.50	1.00	3.40	0.55	24.0	0.26	22.0	5.90	4.20	0.50	0.24	17.00	1.60
98MOB0050	43	24	210	38.0	2.20	1.20	0.78	2.60	0.42	19.0	0.19	16.0	4.50	3.20	0.38	0.18	13.00	1.20
98MOB0051	69	41	230	57.0	2.90	1.50	1.00	3.60	0.55	28.0	0.24	25.0	6.60	4.60	0.51	0.23	17.00	1.50
98MOB0052	80	60	210	85.0	3.50	1.80	1.40	4.60	0.68	42.0	0.29	35.0	9.60	6.10	0.63	0.27	20.00	1.80
98MOB0053	40	21	270	45.0	2.50	1.30	0.90	2.90	0.48	22.0	0.21	19.0	5.20	3.70	0.44	0.21	14.00	1.40
98MOB0055	73	42	260	54.0	3.10	1.70	1.10	3.80	0.62	27.0	0.27	24.0	6.40	4.70	0.55	0.25	18.00	1.70
98MOB0056	66	37	330	72.0	3.90	2.00	1.50	5.10	0.77	34.0	0.33	33.0	8.50	6.50	0.74	0.32	23.00	2.20
98MOB0057	67	47	300	78.0	3.70	2.10	1.50	5.00	0.77	38.0	0.32	36.0	9.50	6.60	0.75	0.31	23.00	2.10
98MOB0058	68	41	290	67.0	3.80	2.10	1.50	4.90	0.77	34.0	0.35	32.0	8.80	6.30	0.72	0.34	24.00	2.20
98MOB0059	68	40	400	72.0	4.60	2.50	1.50	5.50	0.91	40.0	0.41	37.0	10.00	7.00	0.83	0.38	27.00	2.60
98MOB0060	63	32	360	60.0	3.70	2.20	1.30	4.40	0.78	28.0	0.37	27.0	7.20	5.30	0.66	0.33	23.00	2.30
98MOB0061	72	42	210	50.0	3.60	2.10	1.30	4.00	0.74	24.0	0.32	23.0	6.30	4.70	0.62	0.32	22.00	2.10
98MOB0062	66	34	300	54.0	3.60	2.00	1.40	4.30	0.72	28.0	0.34	27.0	7.30	5.50	0.65	0.33	22.00	2.10
98MOB0063	76	48	250	63.0	3.80	2.10	1.40	4.60	0.73	32.0	0.34	30.0	8.00	5.70	0.66	0.31	23.00	2.20
98MOB0064	60	33	280	53.0	3.30	1.90	1.30	4.00	0.68	27.0	0.30	26.0	6.90	5.10	0.60	0.28	20.00	2.10
98MOB0065	65	40	300	70.0	3.80	2.00	1.40	4.60	0.75	34.0	0.33	32.0	8.40	6.00	0.68	0.32	23.00	2.30
98MOB0066	56	32	310	65.0	3.30	1.80	1.40	4.20	0.67	31.0	0.31	30.0	8.10	5.60	0.61	0.27	20.00	1.90
98MOB0067	61	38	300	66.0	3.40	1.80	1.40	4.20	0.64	31.0	0.30	29.0	7.70	5.40	0.62	0.29	20.00	1.90
98MOB0068	81	70	170	67.0	2.90	1.40	1.20	4.00	0.55	33.0	0.23	29.0	7.90	5.20	0.54	0.22	17.00	1.50
98MOB0069	68	47	290	68.0	3.50	1.80	1.40	4.50	0.69	36.0	0.32	33.0	8.80	6.00	0.65	0.29	23.00	2.00
98MOB0070	63	37	290	68.0	3.30	1.80	1.30	4.10	0.66	35.0	0.30	30.0	8.20	5.30	0.62	0.28	21.00	1.90
98MOB0071	62	35	310	56.0	3.30	1.80	1.30	4.10	0.64	28.0	0.30	26.0	7.00	5.10	0.60	0.28	21.00	1.90
98MOB0072	79	54	230	53.0	3.10	1.60	1.20	3.70	0.62	27.0	0.28	25.0	6.50	4.60	0.53	0.27	20.00	1.80
98MOB0073	67	43	230	51.0	3.10	1.60	1.20	3.80	0.60	25.0	0.28	24.0	6.20	4.50	0.56	0.26	19.00	1.80
98MOB0074	65	48	230	65.0	3.40	1.80	1.20	4.20	0.67	33.0	0.30	29.0	7.90	5.40	0.61	0.28	21.00	1.90
98MOB0075	59	39	310	61.0	3.40	1.70	1.30	4.30	0.68	31.0	0.30	29.0	7.60	5.50	0.60	0.27	21.00	1.90
98MOB0076	70	45	210	69.0	3.30	1.70	1.20	4.30	0.65	35.0	0.29	30.0	8.20	5.50	0.62	0.27	21.00	1.80
98MOB0077	58	33	290	62.0	3.40	1.70	1.20	4.20	0.66	33.0	0.30	29.0	7.90	5.50	0.63	0.28	22.00	1.90
98MOB0078	56	26	400	60.0	3.60	1.80	1.30	4.10	0.69	30.0	0.32	27.0	7.40	5.30	0.62	0.29	22.00	2.00
98MOB0110	70	36	300	54.0	3.70	2.00	1.30	4.40	0.75	27.0	0.35	27.0	6.90	5.20	0.64	0.32	23.00	2.20
98MOB0111	65	34	310	56.0	3.40	1.80	1.30	4.20	0.69	29.0	0.33	28.0	7.20	5.20	0.61	0.30	22.00	2.10
98MOB0112	66	39	330	65.0	3.40	1.70	1.40	4.40	0.66	32.0	0.30	30.0	8.10	5.70	0.63	0.26	21.00	1.90
98MOB0113	55	38	190	51.0	2.60	1.30	1.10	3.40	0.49	26.0	0.21	24.0	6.40	4.40	0.48	0.21	16.00	1.40
98MOB0114	59	45	260	66.0	3.10	1.50	1.40	4.30	0.60	34.0	0.26	32.0	8.40	5.70	0.56	0.24	19.00	1.60
98MOB0115	71	40	370	76.0	3.80	2.00	1.60	5.00	0.76	37.0	0.34	37.0	9.90	6.70	0.72	0.31	24.00	2.20
98MOB0116	74	49	220	70.0	3.40	1.80	1.40	4.50	0.69	35.0	0.31	32.0	8.30	5.70	0.65	0.29	21.00	1.90
98MOB0117	56	30	290	61.0	3.10	1.50	1.30	4.10	0.60	31.0	0.27	30.0	7.90	5.30	0.60	0.25	19.00	1.70
98MOB0118	58	34	310	60.0	3.20	1.60	1.30	4.20	0.62	30.0	0.28	30.0	7.60	5.30	0.59	0.26	19.00	1.80
98MOB0119	52	28	310	59.0	3.00	1.50	1.20	3.90	0.58	29.0	0.25	29.0	7.30	4.90	0.58	0.24	18.00	1.60
98MOB0120	72	42	240	57.0	3.00	1.60	1.10	3.80	0.60	28.0	0.27	27.0	6.90	4.40	0.57	0.25	19.00	1.60
98MOB0121	46	33	290	50.0	2.90	1.50	1.10	3.60	0.57	24.0	0.26	24.0	6.00	4.20	0.53	0.25	18.00	1.60

Appendix D.1
Till geochemistry (<0.063 mm)
Rankin Inlet area

SAMPLE ID	V	Zn	Zr	Ce	Dy	Er	Eu	Gd	Ho	La	Lu	Nd	Pr	Sm	Tb	Tm	Y	Yb
Detection limit	*5 ppm*	*5 ppm*	*10 ppm*	*0.1 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.1 ppm*	*0.02 ppm*	*0.1 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.05 ppm*
98MOB0122	85	60	240	90.0	3.70	1.80	1.40	4.80	0.72	45.0	0.31	39.0	10.00	6.50	0.71	0.30	22.00	1.90
98MOB0123	52	26	330	60.0	3.20	1.60	1.20	3.90	0.62	31.0	0.28	30.0	7.80	5.10	0.59	0.26	20.00	1.70
98MOB0124	51	25	400	61.0	3.30	1.70	1.20	4.20	0.64	29.0	0.29	29.0	7.60	5.20	0.62	0.28	21.00	1.80
98MOB0125	57	32	270	58.0	3.00	1.60	1.30	3.80	0.59	29.0	0.27	29.0	7.30	5.00	0.56	0.24	19.00	1.60
98MOB0126	57	36	300	63.0	3.30	1.70	1.30	4.20	0.65	32.0	0.29	32.0	8.20	5.50	0.64	0.27	21.00	1.80
98MOB0127	84	51	310	110.0	3.50	1.80	1.50	4.90	0.67	52.0	0.30	44.0	12.00	6.70	0.69	0.28	21.00	1.80
98MOB0128	49	24	350	56.0	3.20	1.70	1.20	4.10	0.66	28.0	0.28	28.0	7.30	5.10	0.63	0.27	21.00	1.80
98MOB0129	83	54	260	71.0	3.80	2.00	1.40	5.00	0.74	40.0	0.32	36.0	9.50	6.40	0.71	0.31	23.00	2.10
98MOB0130	45	26	290	51.0	2.80	1.50	1.00	3.50	0.56	26.0	0.25	24.0	6.20	4.50	0.53	0.23	17.00	1.70
98MOB0131	42	22	210	44.0	2.60	1.30	0.97	3.10	0.51	22.0	0.23	20.0	5.30	3.90	0.48	0.21	15.00	1.50
98MOB0132	77	43	280	65.0	3.50	1.80	1.30	4.60	0.70	33.0	0.28	30.0	7.80	5.40	0.65	0.28	21.00	2.00
98MOB0133	51	29	230	50.0	3.00	1.60	1.00	3.60	0.60	26.0	0.26	23.0	6.10	4.20	0.53	0.25	18.00	1.70
98MOB0134	56	31	300	68.0	3.60	2.00	1.30	4.70	0.74	36.0	0.31	32.0	8.70	5.80	0.69	0.31	22.00	2.10
98MOB0135	43	23	260	50.0	2.70	1.40	0.99	3.50	0.54	26.0	0.23	23.0	6.10	4.30	0.51	0.22	16.00	1.50
98MOB0136	44	23	210	38.0	2.40	1.20	0.84	3.00	0.48	21.0	0.21	19.0	5.00	3.70	0.44	0.21	14.00	1.40
98MOB0137	43	20	270	46.0	2.50	1.40	0.90	3.10	0.49	23.0	0.23	21.0	5.60	3.80	0.47	0.21	16.00	1.50
98MOB0138	66	38	300	84.0	3.90	2.00	1.40	5.20	0.77	43.0	0.31	37.0	9.90	6.60	0.77	0.31	23.00	2.10
98MOB0139	47	27	280	58.0	3.00	1.60	1.10	4.00	0.59	30.0	0.26	26.0	6.90	4.80	0.58	0.26	19.00	1.80
98MOB0140	52	27	340	62.0	3.50	1.90	1.20	4.40	0.70	32.0	0.31	29.0	7.60	5.50	0.65	0.30	21.00	2.00
98MOB0141	78	44	280	73.0	4.00	2.10	1.40	5.00	0.79	38.0	0.32	32.0	8.60	6.10	0.75	0.33	24.00	2.20
98MOB0142	48	23	370	63.0	3.60	1.90	1.20	4.50	0.70	32.0	0.31	28.0	7.40	5.40	0.66	0.30	21.00	2.10
98MOB0143	94	56	220	65.0	3.30	1.70	1.30	4.20	0.67	33.0	0.29	29.0	7.70	5.30	0.64	0.27	20.00	1.80
98MOB0144	93	75	170	67.0	3.60	1.90	1.60	5.10	0.72	39.0	0.28	36.0	9.50	6.50	0.71	0.29	21.00	1.90
98MOB0145	83	49	340	75.0	3.90	2.00	1.60	5.00	0.75	37.0	0.33	34.0	8.90	6.30	0.75	0.32	22.00	2.20
98MOB0146	57	27	380	63.0	3.40	1.70	1.30	4.50	0.67	31.0	0.27	29.0	7.50	5.50	0.66	0.28	20.00	1.90
98MOB0147	81	47	270	69.0	3.50	1.80	1.50	5.00	0.68	36.0	0.29	34.0	8.80	6.30	0.72	0.28	20.00	2.00
98MOB0148	100	56	220	52.0	3.40	1.80	1.20	4.20	0.68	26.0	0.30	24.0	6.40	4.80	0.65	0.28	20.00	1.90
98MOB0149	77	43	250	57.0	3.30	1.80	1.20	4.20	0.65	28.0	0.28	26.0	6.80	4.90	0.65	0.28	20.00	1.90
98MOB0150	87	51	230	57.0	3.40	1.70	1.20	4.20	0.66	29.0	0.29	26.0	6.90	5.10	0.64	0.27	20.00	1.90
98MOB0151	68	37	240	52.0	3.10	1.60	1.10	3.80	0.59	27.0	0.25	24.0	6.40	4.60	0.59	0.24	18.00	1.70
98MOB0152	68	35	280	85.0	4.30	2.10	1.50	5.50	0.84	43.0	0.34	38.0	9.90	6.90	0.81	0.34	24.00	2.30
98MOB0153	53	32	280	74.0	3.60	1.80	1.30	4.60	0.71	36.0	0.28	31.0	8.50	5.70	0.68	0.30	21.00	2.00
98MOB0154	50	32	270	49.0	2.80	1.40	1.00	3.70	0.54	27.0	0.25	24.0	6.40	4.50	0.53	0.23	17.00	1.70
98MOB0155	49	24	300	55.0	3.10	1.60	1.20	3.80	0.61	28.0	0.26	25.0	6.50	4.60	0.60	0.28	19.00	1.90
98MOB0156	60	34	270	54.0	3.10	1.60	1.10	3.90	0.62	27.0	0.27	24.0	6.50	4.70	0.56	0.26	19.00	1.80
98MOB0157	75	47	250	57.0	3.40	1.80	1.20	4.40	0.71	30.0	0.30	27.0	7.30	5.30	0.66	0.30	21.00	2.00

Appendix D.1
QA/QC
Till geochemistry - Rankin Inlet

SAMPLE ID	SiO2	TiO2	Al2O3	Fe2O3T	MnO	MgO	CaO	Na2O	K2O	P2O5	Ba	LOI	Ag	Be
Detection limit	*0.5 %*	*0.02 %*	*0.2 %*	*0.06 %*	*0.01 %*	*0.04 %*	*0.01 %*	*0.03 %*	*0.05 %*	*0.01 %*	*30 ppm*	*0.1 %*	*0.1 ppm*	*0.5 ppm*
Duplicates:														
97MOB0132	69.40	0.56	13.30	4.40	0.05	1.68	2.95	3.40	2.17	0.21	690	1.0	-0.1	1.4
Duplicate	70.20	0.56	13.30	4.50	0.05	1.69	2.97	3.40	2.18	0.21	690	1.0	0.2	1.3
98MOB0013	72.30	0.55	12.60	3.60	0.04	1.39	2.81	3.40	2.09	0.20	690	1.1	-0.1	1.3
Duplicate	71.90	0.54	12.60	3.50	0.04	1.34	2.74	3.30	2.05	0.20	690	1.1	0.1	1.3
98MOB0057	68.10	0.55	15.10	4.00	0.05	1.48	3.88	4.10	2.23	0.24	670	0.5	-0.1	1.6
Duplicate	68.30	0.56	15.00	4.10	0.06	1.47	3.87	4.00	2.22	0.24	690	0.5	0.2	1.4
98MOB0077	73.30	0.50	11.90	3.60	0.05	1.31	2.84	3.20	2.13	0.21	690	0.7	-0.1	1.3
Duplicate	73.50	0.49	12.00	3.60	0.05	1.32	2.84	3.20	2.15	0.20	680	0.7	0.1	1.3
98MOB0128	75.10	0.49	11.40	3.10	0.04	1.00	2.92	3.20	1.90	0.20	640	0.4	-0.1	1.3
Duplicate	75.20	0.49	11.30	3.10	0.04	0.98	2.91	3.20	1.89	0.20	640	0.4	-0.1	1.4
98MOB0148	67.20	0.64	12.60	5.70	0.07	2.17	4.12	3.00	1.84	0.18	560	2.8	0.3	1.1
Duplicate	67.40	0.63	12.50	5.60	0.07	2.15	4.12	3.00	1.85	0.19	570	2.7	0.2	1.1
Standards:														
TCA8010A	74.90	0.43	11.40	3.00	0.04	1.08	2.17	3.00	2.30	0.13	550	1.4	-0.1	1.1
TCA8010B	75.20	0.43	11.50	3.10	0.04	1.11	2.18	2.90	2.31	0.13	550	1.5	0.2	1.1

Appendix D.1
QA/QC
Till geochemistry - Rankin Inlet

SAMPLE ID	Bi	Cd	Co	Cr	Cs	Cu	Ga	Hf	In	Mo	Nb	Ni	Pb	Rb
Detection limit	*0.2 ppm*	*0.2 ppm*	*5 ppm*	*10 ppm*	*0.02 ppm*	*10 ppm*	*0.1 ppm*	*0.05 ppm*	*0.05 ppm*	*0.2 ppm*	*0.05 ppm*	*10 ppm*	*2 ppm*	*0.05 ppm*
Duplicates:														
97MOB0132	0.2	-0.2	15	85	1.80	45	17.00	7.30	-0.05	0.6	9.10	44	19	67.00
Duplicate	0.2	-0.2	15	83	1.80	44	16.00	7.10	0.06	0.6	8.90	45	20	67.00
98MOB0013	-0.2	-0.2	11	76	1.50	30	15.00	7.70	-0.05	0.5	9.10	34	19	61.00
Duplicate	-0.2	-0.2	11	75	1.40	26	15.00	7.90	0.08	0.5	8.90	34	18	62.00
98MOB0057	0.2	-0.2	10	55	1.20	23	19.00	8.30	-0.05	1.0	8.90	23	20	68.00
Duplicate	0.4	-0.2	10	54	1.20	26	19.00	8.90	0.07	1.2	8.80	25	20	67.00
98MOB0077	-0.2	-0.2	9	60	1.50	28	14.00	8.00	-0.05	0.5	9.20	27	18	67.00
Duplicate	-0.2	-0.2	10	61	1.50	28	15.00	8.00	-0.05	0.3	9.30	28	18	68.00
98MOB0128	-0.2	-0.2	7	51	0.88	22	13.00	9.40	-0.05	0.4	9.20	20	17	56.00
Duplicate	-0.2	-0.2	7	53	0.91	23	14.00	9.70	-0.05	0.3	9.50	21	18	58.00
98MOB0148	-0.2	-0.2	21	103	1.50	73	16.00	6.40	0.06	0.7	8.20	59	17	59.00
Duplicate	-0.2	-0.2	22	106	1.60	75	17.00	6.60	0.07	0.8	8.50	61	17	61.00
Standards:														
TCA8010A	-0.2	-0.2	9	55	1.10	28	13.00	7.50	-0.05	0.4	7.50	20	12	56.00
TCA8010B	-0.2	-0.2	8	54	1.10	27	13.00	7.40	-0.05	0.5	7.60	20	13	58.00

Appendix D.1
QA/QC
Till geochemistry - Rankin Inlet

SAMPLE ID	Sb	Sc	Sn	Sr	Ta	Te	Th	Tl	U	V	Zn	Zr	Ce	Dy
Detection limit	*0.2 ppm*	*0.5 ppm*	*0.5 ppm*	*10 ppm*	*0.05 ppm*	*0.2 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*5 ppm*	*5 ppm*	*10 ppm*	*0.1 ppm*	*0.02 ppm*
Duplicates:														
97MOB0132	-0.2	11.0	1.5	410	0.67	-0.2	8.90	0.55	2.40	73	49	260.0	65.0	3.50
Duplicate	-0.2	11.0	1.5	400	0.69	-0.2	8.60	0.52	2.20	74	48	260.0	62.0	3.40
98MOB0013	-0.2	10.0	2.5	400	0.65	-0.2	6.60	0.45	1.60	62	51	300.0	58.0	3.10
Duplicate	-0.2	10.0	2.4	400	0.66	-0.2	6.40	0.50	1.70	62	46	300.0	59.0	3.10
98MOB0057	-0.2	10.0	2.3	420	0.67	-0.2	9.70	0.44	2.90	67	47	300.0	78.0	3.70
Duplicate	-0.2	11.0	2.5	420	0.69	-0.2	9.60	0.49	3.10	68	42	300.0	77.0	3.90
98MOB0077	-0.2	9.3	1.6	370	0.69	-0.2	8.30	0.52	1.80	58	33	290.0	62.0	3.40
Duplicate	-0.2	9.3	1.4	380	0.70	-0.2	8.10	0.50	1.80	58	33	320.0	61.0	3.40
98MOB0128	-0.2	8.1	1.1	390	0.69	-0.2	6.40	0.43	1.80	49	24	350.0	56.0	3.20
Duplicate	-0.2	8.3	1.2	390	0.72	-0.2	6.70	0.48	2.00	50	25	350.0	58.0	3.50
98MOB0148	0.3	15.0	1.0	370	0.65	-0.2	6.40	0.47	1.60	100	56	220.0	52.0	3.40
Duplicate	0.3	15.0	1.2	360	0.66	-0.2	6.60	0.53	1.70	102	58	220.0	54.0	3.50
Standards:														
TCA8010A	2.4	9.3	1.0	350	0.49	-0.2	5.50	0.41	1.10	50	31	280.0	49.0	2.90
TCA8010B	2.4	9.5	0.7	350	0.52	-0.2	6.00	0.41	1.10	51	32	260.0	52.0	3.00

Appendix D.1
QA/QC
Till geochemistry - Rankin Inlet

SAMPLE ID	Er	Eu	Gd	Ho	La	Lu	Nd	Pr	Sm	Tb	Tm	Y	Yb
Detection limit	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.1 ppm*	*0.02 ppm*	*0.1 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.02 ppm*	*0.05 ppm*
Duplicates:													
97MOB0132	1.90	1.40	4.60	0.69	37.0	0.31	34.0	9.00	6.10	0.66	0.30	22.00	1.90
Duplicate	1.80	1.40	4.50	0.67	36.0	0.28	33.0	8.60	5.80	0.66	0.29	20.00	1.90
98MOB0013	1.70	1.30	4.00	0.60	29.0	0.27	28.0	7.10	5.10	0.57	0.25	19.00	1.70
Duplicate	1.60	1.20	4.10	0.62	30.0	0.27	28.0	7.20	5.10	0.60	0.27	19.00	1.80
98MOB0057	2.10	1.50	5.00	0.77	38.0	0.32	36.0	9.50	6.60	0.75	0.31	23.00	2.10
Duplicate	1.90	1.50	5.20	0.75	38.0	0.32	35.0	9.30	6.70	0.77	0.31	22.00	2.20
98MOB0077	1.70	1.20	4.20	0.66	33.0	0.30	29.0	7.90	5.50	0.63	0.28	22.00	1.90
Duplicate	1.80	1.30	4.50	0.68	32.0	0.29	29.0	7.80	5.60	0.65	0.29	20.00	2.00
98MOB0128	1.70	1.20	4.10	0.66	28.0	0.28	28.0	7.30	5.10	0.63	0.27	21.00	1.80
Duplicate	1.90	1.40	4.40	0.68	30.0	0.31	29.0	7.50	5.30	0.65	0.29	21.00	2.00
98MOB0148	1.80	1.20	4.20	0.68	26.0	0.30	24.0	6.40	4.80	0.65	0.28	20.00	1.90
Duplicate	1.90	1.30	4.30	0.72	28.0	0.30	26.0	6.70	5.10	0.67	0.30	21.00	2.10
Standards:													
TCA8010A	1.60	1.00	3.60	0.58	26.0	0.26	24.0	6.30	4.30	0.54	0.25	18.00	1.60
TCA8010B	1.50	1.10	3.80	0.59	27.0	0.26	24.0	6.30	4.60	0.57	0.25	18.00	1.70

Sample #		S1990	98-J-14
SiO2	wt. %	24.9	26.5
TiO2	wt. %	3.28	3.01
Al2O3	wt. %	3.82	3.85
Fe2O3 tot	wt. %	13.80	13.57
MnO	wt. %	0.28	0.29
MgO	wt. %	19.7	23.44
CaO	wt. %	14.6	14.67
Na2O	wt. %	0.3	0.34
K2O	wt. %	0.58	0.4
P2O5	wt. %	1.05	1.15
LOI	wt. %	17.3	13.3
Sum	wt. %	99.61	100.52
Be	ppm		2.4
Sr	ppm	1120	1459
Ba	ppm	1610	1231
Nb	ppm	300	333
Zr	ppm	282	297
Hf	ppm		8.3
Ta	ppm		13
Th	ppm	59	21
U	ppm	7	2
Pb	ppm		14
Sc	ppm		25
V	ppm		314
Cr	ppm	938	
Ni	ppm		546
Co	ppm		74
Cu	ppm		109
Zn	ppm		99
La	ppm	303	160
Ce	ppm	549	270
Pr	ppm	56.9	24
Nd	ppm	195	119
Sm	ppm	23.4	15.4
Eu	ppm	6.1	4
Gd	ppm	16.7	12.7
Tb	ppm	1.9	0.3
Dy	ppm	5.9	4.3
Ho	ppm	2.9	1.9
Er	ppm	2	2
Tm	ppm	0.3	0.3
Yb	ppm	1.4	1.3
Lu	ppm	0.1	0.1
Y	ppm	25	16

Appendix E
Kimberlite Indicator Minerals (0.25-2 mm)

Appendix E.1 Total number of potential indicator grains picked per sample

Indicator minerals:

PYR=pyrope garnet; ECL=eclogitic garnet; ILM=Mg-ilmenite; CHR=chromite;
CD=Cr-diopside; OL=olivine

Laboratory:

I. & M. Morrison Geological Services Ltd.

Appendix E.2 Mineral chemistry data for all picked grains

Laboratory:

Geological Survey of Canada Microbeam laboratory

Appendix E.1
Total Number of Potential Indicator Grains per Sample

SAMPLE NO.		SIZE (mm)	Total Weight (g)	POTENTIAL INDICATOR MINERALS							COMMENTS
				PYR	ECL	ILM	CHR	CD	OL	Total No.	
Rankin Inlet till samples:											
97MOB	0097	0.25-0.5	2.1	0	2	0	1	0	0	**3**	
97MOB	0097	0.5-1.0	0.4	0	0	0	0	0	0	0	
97MOB	0097	1.0-2.0	0.2	0	0	0	0	0	0	0	
97MOB	0106	0.25-0.5	3.9	0	35	0	3	1	2	**41**	ECL: some w/ kelyphite?; CD: low Cr
97MOB	0106	0.5-1.0	0.5	0	2	0	0	0	0	**2**	ECL: 1 w/ kelyphite?
97MOB	0106	1.0-2.0	0.2	0	0	0	0	0	0	0	
97MOB	0107	0.25-0.5	3.6	0	33	0	1	0	1	**35**	
97MOB	0107	0.5-1.0	0.6	0	0	0	0	0	0	0	
97MOB	0107	1.0-2.0	0.2	0	0	0	0	0	0	0	
97MOB	0123	0.25-0.5	2.7	0	33	0	0	2	10	**45**	CD: low Cr
97MOB	0123	0.5-1.0	0.5	0	0	0	0	0	0	0	
97MOB	0123	1.0-2.0	0.1	0	0	0	0	0	0	0	
97MOB	0127	0.25-0.5	1.5	0	0	0	2	0	0	**2**	
97MOB	0127	0.5-1.0	0.3	0	1	1	0	0	0	**2**	
97MOB	0127	1.0-2.0	0.1	0	0	0	0	0	0	0	
97MOB	0132	0.25-0.5	3.1	0	29	3	0	0	4	**36**	ILM: likely crustal
97MOB	0132	0.5-1.0	0.5	0	0	0	0	0	0	0	
97MOB	0132	1.0-2.0	0.2	0	0	0	0	0	0	0	
97MOB	0138	0.25-0.5	5.1	0	6	4	0	1	1	**12**	CD: low Cr
97MOB	0138	0.5-1.0	1.0	0	1	0	0	0	0	**1**	
97MOB	0138	1.0-2.0	0.3	0	0	0	0	0	0	0	
97MOB	0161	0.25-0.5	3.3	0	30	0	2	2	1	**35**	CD: low Cr
97MOB	0161	0.5-1.0	0.6	0	0	0	0	0	1	**1**	
97MOB	0161	1.0-2.0	0.3	0	0	0	0	0	0	0	
97MOB	0164	0.25-0.5	2.6	0	1	0	0	0	0	**1**	
97MOB	0164	0.5-1.0	0.4	0	0	0	0	0	0	0	
97MOB	0164	1.0-2.0	0.3	0	0	0	0	0	0	0	
97MOB	0166	0.25-0.5	1.8	0	2	0	3	1	1	**7**	CD: low Cr
97MOB	0166	0.5-1.0	0.3	0	0	0	0	0	0	0	
97MOB	0166	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0008	0.25-0.5	2.1	0	3	1	2	1	2	**9**	
98MOB	0008	0.5-1.0	0.4	0	0	0	0	0	2	**2**	
98MOB	0008	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0011	0.25-0.5	1.6	0	9	0	1	0	4	**14**	
98MOB	0011	0.5-1.0	0.5	0	0	0	0	0	0	0	
98MOB	0011	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0024	0.25-0.5	3.8	0	2	1	3	2	0	**8**	CD: low Cr
98MOB	0024	0.5-1.0	1.0	0	0	0	0	0	0	0	
98MOB	0024	1.0-2.0	0.3	0	0	0	0	0	0	0	
98MOB	0061	0.25-0.5	3.9	0	13	0	5	2	5	**25**	CD: low Cr
98MOB	0061	0.5-1.0	1.2	0	2	0	0	0	0	**2**	
98MOB	0061	1.0-2.0	0.5	0	0	0	0	0	0	0	
98MOB	0072	0.25-0.5	2.7	1	1	0	2	2	0	**6**	CD: low Cr
98MOB	0072	0.5-1.0	0.8	0	0	0	0	0	0	0	
98MOB	0072	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0074	0.25-0.5	5.7	0	15	0	1	1	1	**18**	
98MOB	0074	0.5-1.0	1.3	0	3	0	0	0	0	**3**	
98MOB	0074	1.0-2.0	0.3	0	0	0	0	0	0	0	
98MOB	0075	0.25-0.5	6.1	0	1	0	4	3	0	**8**	CD: low Cr
98MOB	0075	0.5-1.0	1.4	0	1	0	0	0	0	**1**	
98MOB	0075	1.0-2.0	0.4	0	0	0	0	0	0	0	
98MOB	0077	0.25-0.5	3.9	0	10	0	0	0	0	**10**	
98MOB	0077	0.5-1.0	0.9	0	0	0	0	0	0	0	
98MOB	0077	1.0-2.0	0.4	0	0	0	0	0	0	0	
98MOB	0099	0.25-0.5	15.3	0	5	0	2	0	0	**7**	
98MOB	0099	0.5-1.0	8.4	0	5	0	0	0	0	**5**	
98MOB	0099	1.0-2.0	3.0	0	0	0	0	0	0	0	
98MOB	0114	0.25-0.5	1.4	0	0	0	0	0	1	**1**	
98MOB	0114	0.5-1.0	0.4	0	0	1	0	0	0	**1**	
98MOB	0114	1.0-2.0	0.1	0	0	0	0	0	0	0	
98MOB	0128	0.25-0.5	2.8	0	5	0	0	0	0	**5**	

Appendix E.1
Total Number of Potential Indicator Grains per Sample

SAMPLE NO.		SIZE (mm)	Total Weight (g)	POTENTIAL INDICATOR MINERALS							COMMENTS
				PYR	ECL	ILM	CHR	CD	OL	Total No.	
98MOB	0128	0.5-1.0	0.8	0	1	0	0	0	0	**1**	
98MOB	0128	1.0-2.0	0.3	0	0	0	0	0	0	0	
98MOB	0129	0.25-0.5	1.0	0	0	2	0	1	0	**3**	ILM: likely crustal; CD: low Cr
98MOB	0129	0.5-1.0	0.4	0	0	0	0	0	0	0	
98MOB	0129	1.0-2.0	0.3	0	0	0	0	0	0	0	
98MOB	0131	0.25-0.5	1.8	0	0	0	0	0	0	0	
98MOB	0131	0.5-1.0	0.6	0	0	0	0	0	0	0	
98MOB	0131	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0133	0.25-0.5	2.5	0	0	0	0	1	0	**1**	CD: low Cr
98MOB	0133	0.5-1.0	0.6	0	0	0	0	0	0	0	
98MOB	0133	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0135	0.25-0.5	2.6	0	0	0	0	0	0	0	
98MOB	0135	0.5-1.0	0.6	0	0	0	0	0	0	0	
98MOB	0135	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0137	0.25-0.5	1.9	0	0	0	0	0	0	0	
98MOB	0137	0.5-1.0	0.4	0	0	0	0	0	0	0	
98MOB	0137	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0146	0.25-0.5	1.6	0	0	0	0	0	0	0	
98MOB	0146	0.5-1.0	0.5	0	0	0	0	0	0	0	
98MOB	0146	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0148	0.25-0.5	1.9	0	0	0	0	1	0	**1**	
98MOB	0148	0.5-1.0	0.5	0	0	0	0	0	1	**1**	
98MOB	0148	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0150	0.25-0.5	2.9	0	3	0	1	1	0	**5**	
98MOB	0150	0.5-1.0	0.6	0	0	0	0	0	0	0	
98MOB	0150	1.0-2.0	0.3	0	0	0	0	0	0	0	
98MOB	0155	0.25-0.5	2.2	0	0	0	0	1	0	**1**	
98MOB	0155	0.5-1.0	0.7	0	0	0	0	0	0	0	
98MOB	0155	1.0-2.0	0.3	0	0	0	0	0	0	0	
98MOB	0157	0.25-0.5	3.9	0	0	0	1	0	1	**2**	
98MOB	0157	0.5-1.0	1.0	0	0	0	1	0	0	**1**	CHR: likely non kimberlitic
98MOB	0157	1.0-2.0	0.3	0	0	0	0	0	0	0	
98MOB	0160	0.25-0.5	1.6	0	0	0	0	0	0	0	
98MOB	0160	0.5-1.0	0.4	0	0	0	0	0	0	0	
98MOB	0160	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0161	0.25-0.5	2.5	0	0	0	0	0	0	0	
98MOB	0161	0.5-1.0	0.7	0	0	1	0	0	0	**1**	
98MOB	0161	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0165	0.25-0.5	2.7	0	0	0	0	0	0	0	
98MOB	0165	0.5-1.0	0.6	0	0	0	0	0	0	0	
98MOB	0165	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0167	0.25-0.5	2.4	0	0	0	0	2	0	**2**	CD: Low Cr
98MOB	0167	0.5-1.0	0.7	0	0	0	0	0	0	0	
98MOB	0167	1.0-2.0	0.3	0	0	0	0	0	0	0	
98MOB	0169	0.25-0.5	2.3	0	0	0	0	0	0	0	
98MOB	0169	0.5-1.0	0.6	0	0	0	0	0	0	0	
98MOB	0169	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0176	0.25-0.5	4.1	0	0	1	1	0	0	**2**	
98MOB	0176	0.5-1.0	1.2	0	0	0	0	0	0	0	
98MOB	0176	1.0-2.0	0.3	0	0	0	0	0	0	0	
98MOB	0178	0.25-0.5	4.5	0	1	1	0	0	2	**4**	
98MOB	0178	0.5-1.0	1.8	0	0	0	0	0	0	0	
98MOB	0178	1.0-2.0	0.8	0	0	0	0	0	0	0	
98MOB	0180	0.25-0.5	3.2	0	0	0	0	0	3	**3**	
98MOB	0180	0.5-1.0	1.0	0	0	0	0	0	1	**1**	
98MOB	0180	1.0-2.0	0.5	0	0	0	0	0	0	0	
98MOB	0184	0.25-0.5	9.1	0	0	0	0	0	0	0	
98MOB	0184	0.5-1.0	2.3	0	0	0	0	0	0	0	
98MOB	0184	1.0-2.0	0.4	0	0	0	0	0	0	0	
98MOB	0186	0.25-0.5	3.1	0	0	0	0	0	0	0	
98MOB	0186	0.5-1.0	0.8	0	0	0	0	0	0	0	
98MOB	0186	1.0-2.0	0.5	0	0	0	0	0	0	0	

Appendix E.1
Total Number of Potential Indicator Grains per Sample

SAMPLE NO.		SIZE (mm)	Total Weight (g)	POTENTIAL INDICATOR MINERALS							COMMENTS
				PYR	ECL	ILM	CHR	CD	OL	Total No.	
98MOB	0188	0.25-0.5	3.9	0	1	1	0	0	0	**2**	ILM: likely crustal
98MOB	0188	0.5-1.0	1.0	0	0	0	0	0	0	0	
98MOB	0188	1.0-2.0	0.3	0	0	0	0	0	0	0	
98MOB	0190	0.25-0.5	1.9	0	1	2	0	1	0	**4**	ILM: likely crustal; CD: low Cr
98MOB	0190	0.5-1.0	0.6	0	0	0	0	0	0	0	
98MOB	0190	1.0-2.0	0.3	0	0	0	0	0	0	0	
98MOB	0193	0.25-0.5	3.0	0	1	0	0	1	0	**2**	
98MOB	0193	0.5-1.0	1.1	0	1	0	0	0	0	**1**	
98MOB	0193	1.0-2.0	0.3	0	0	0	0	0	0	0	
98MOB	0198	0.25-0.5	1.5	0	2	0	0	0	0	**2**	
98MOB	0198	0.5-1.0	0.5	0	0	0	0	0	0	0	
98MOB	0198	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0203	0.25-0.5	2.8	0	0	0	0	1	0	**1**	
98MOB	0203	0.5-1.0	0.9	0	0	0	0	0	0	0	
98MOB	0203	1.0-2.0	0.4	0	0	0	0	0	0	0	
98MOB	0205	0.25-0.5	2.8	0	0	1	0	0	0	**1**	
98MOB	0205	0.5-1.0	0.5	0	1	0	0	0	0	**1**	
98MOB	0205	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0210	0.25-0.5	1.7	0	0	0	0	0	0	0	
98MOB	0210	0.5-1.0	0.4	0	1	0	0	0	0	**1**	
98MOB	0210	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0213	0.25-0.5	1.8	0	0	1	0	0	0	**1**	ILM: likely crustal
98MOB	0213	0.5-1.0	0.4	0	0	0	0	0	0	0	
98MOB	0213	1.0-2.0	0.2	0	0	0	0	0	0	0	
98MOB	0217	0.25-0.5	1.7	0	0	0	0	0	0	0	
98MOB	0217	0.5-1.0	0.6	0	0	1	0	0	0	**1**	ILM: likely crustal
98MOB	0217	1.0-2.0	0.3	0	0	0	0	0	0	0	
MacQuoid Lake sediment samples:											
98HJB	0001	0.25-0.5	2.1	0	0	0	0	0	0	0	
98HJB	0002	0.25-0.5	2.1	0	0	1	0	0	0	**1**	
98HJB	0003	0.25-0.5	6.2	0	3	1	0	0	1	**5**	
98HJB	0004	0.25-0.5	7.9	0	1	1	0	0	1	**3**	
98HJB	0005	0.25-0.5	6.2	0	0	0	0	0	0	0	
98HJB	0006	0.25-0.5	4.3	0	0	0	0	0	0	0	
98HJB	0007	0.25-0.5	3.4	0	0	0	0	0	0	0	
98HJB	0008	0.25-0.5	5.0	0	0	0	0	0	0	0	
98HJB	0009	0.25-0.5	4.1	0	0	0	0	0	0	0	
98HJB	0010	0.25-0.5	4.4	0	0	0	0	0	0	0	
98HJB	0011	0.25-0.5	4.0	0	0	0	0	0	0	0	
98HJB	0012	0.25-0.5	9.9	0	0	0	0	0	0	0	
98HJB	0013	0.25-0.5	6.6	0	0	0	0	0	0	0	
98HJB	0014	0.25-0.5	5.2	0	0	0	0	0	0	0	
98HJB	0015	0.25-0.5	6.9	0	0	0	0	0	0	0	
98HJB	0016	0.25-0.5	3.9	0	0	0	0	0	0	0	
98HJB	0017	0.25-0.5	4.5	0	0	0	0	0	0	0	
98HJB	0018	0.25-0.5	3.6	0	0	0	0	0	0	0	
98HJB	0019	0.25-0.5	4.5	0	0	0	0	0	0	0	
98HJB	0020	0.25-0.5	8.7	0	0	0	0	1	0	**1**	CD: likely low Cr
98HJB	0021	0.25-0.5	4.2	0	0	0	0	4	0	**4**	CD: likely low Cr
98HJB	0022	0.25-0.5	3.6	0	0	0	0	0	0	0	
98HJB	0023	0.25-0.5	7.1	0	0	0	0	0	0	0	
98HJB	0024	0.25-0.5	5.3	0	0	0	0	0	0	0	
98HJB	0025	0.25-0.5	3.7	0	0	0	0	1	0	**1**	CD: likely low Cr
98HJB	0026	0.25-0.5	2.7	0	0	0	0	0	0	0	
98HJB	0027	0.25-0.5	9.2	0	0	0	0	0	0	0	
98HJB	0029	0.25-0.5	7.6	0	0	0	0	0	0	0	
98HJB	0030	0.25-0.5	4.7	0	0	1	0	0	0	**1**	
98HJB	0031	0.25-0.5	6.8	0	0	0	0	0	0	0	
98HJB	0032	0.25-0.5	6.0	0	0	0	0	0	0	0	
98HJB	0033	0.25-0.5	6.0	0	0	0	0	0	0	0	
98HJB	0034	0.25-0.5	6.8	0	0	0	0	0	0	0	

Appendix E.1
Total Number of Potential Indicator Grains per Sample

SAMPLE NO.		SIZE (mm)	Total Weight (g)	POTENTIAL INDICATOR MINERALS							COMMENTS
				PYR	ECL	ILM	CHR	CD	OL	Total No.	
98HJB	0035	0.25-0.5	5.7	0	0	0	0	0	0	0	
98HJB	0036	0.25-0.5	7.5	0	0	0	0	0	0	0	
98HJB	0037	0.25-0.5	6.0	0	0	1	0	0	0	**1**	
98HJB	0038	0.25-0.5	4.8	0	0	0	0	0	0	0	
98HJB	0039	0.25-0.5	5.4	0	0	0	0	0	0	0	
98HJB	0040	0.25-0.5	6.2	0	0	0	0	0	0	0	
98HJB	0041	0.25-0.5	6.3	0	0	0	0	0	0	0	
98HJB	0042	0.25-0.5	4.3	0	0	0	0	0	0	0	
98HJB	0043	0.25-0.5	5.4	0	0	0	0	0	0	0	
98HJB	0044	0.25-0.5	4.9	0	0	0	0	0	0	0	
98HJB	0045	0.25-0.5	6.1	0	0	0	0	1	0	**1**	CD: likely low Cr
98HJB	0046	0.25-0.5	5.9	0	0	0	0	0	1	**1**	
98HJB	0047	0.25-0.5	9.8	0	0	0	0	1	0	**1**	CD: likely low Cr
98HJB	0048	0.25-0.5	4.5	0	0	0	0	0	0	0	
98HJB	0049	0.25-0.5	6.2	0	0	0	0	0	0	0	
98HJB	0050	0.25-0.5	4.5	0	0	0	0	0	1	**1**	
98HJB	0051	0.25-0.5	4.2	0	0	0	0	0	1	**1**	
98HJB	0052	0.25-0.5	5.1	0	0	0	0	2	0	**2**	CD: likely low Cr
98HJB	0054	0.25-0.5	0.7	0	0	0	0	0	0	0	
98HJB	0056	0.25-0.5	5.2	0	0	0	0	0	0	0	
98HJB	0057	0.25-0.5	4.5	0	0	0	0	2	1	**3**	CD: likely low Cr
98HJB	0059	0.25-0.5	5.0	0	0	0	0	0	0	0	
98HJB	0060	0.25-0.5	5.0	0	0	0	0	0	0	0	
98HJB	0061	0.25-0.5	2.1	0	0	0	0	0	0	0	
98HJB	0062	0.25-0.5	5.2	0	0	0	0	2	1	**3**	CD: likely low Cr
98HJB	0063	0.25-0.5	5.1	0	0	0	0	3	0	**3**	
98HJB	0064	0.25-0.5	4.3	0	0	0	0	1	0	**1**	CD: likely low Cr
98HJB	0065	0.25-0.5	6.3	0	0	0	0	1	0	**1**	CD: likely low Cr
98HJB	0066	0.25-0.5	3.8	0	0	0	0	0	0	0	
98HJB	0067	0.25-0.5	5.1	0	0	0	0	0	0	0	
98HJB	0068	0.25-0.5	4.6	0	0	0	0	0	0	0	
98HJB	0069	0.25-0.5	5.6	0	0	0	0	0	0	0	
98HJB	0070	0.25-0.5	5.8	0	0	0	0	0	0	0	
98HJB	0071	0.25-0.5	6.8	0	0	0	0	0	0	0	
98HJB	0072	0.25-0.5	4.2	0	0	0	0	0	0	0	
98HJB	0073	0.25-0.5	4.4	0	0	0	0	1	0	**1**	CD: likely low Cr
98HJB	0074	0.25-0.5	5.1	0	0	0	0	0	0	0	
98HJB	0075	0.25-0.5	4.3	0	0	0	0	2	0	**2**	CD: likely low Cr
Kimberlite samples:											
S-1990		0.25-2.0	<0.1	0	0	0	195	0	0	**195**	
98-J-14		0.25-0.5	6.8	0	0	0	85	0	63	**148**	OL: estimate 10 - 20%, not all olivine picked
98-J-14		0.5-1.0	1.3	0	0	0	3	0	64	**67**	OL: estimate 10 - 20%
98-J-14		1.0-2.0	0.1	0	0	0	0	0	15	**15**	

Appendix E.2
Mineral chemistry for all picked grains
SILICATES

Grain	Sample ID	Mineral	Comments	Na2O	K2O	FeO	MgO	Al2O3	SiO2	CaO	TiO2	Cr2O3	MnO	NiO	V2O3	TOTAL
Kimberlite sample 98-J-14:																
" 1-3"	98-J-14 (1-2 mm)	olivine		0.00	0.00	8.45	49.55	0.06	39.74	0.06	0.03	0.10	0.16	0.31	0.08	98.54
" 4"	98-J-14 (1-2 mm)	olivine		0.00	0.00	9.45	48.58	0.09	39.92	0.10	0.04	0.07	0.15	0.31	0.00	98.72
" 5"	98-J-14 (1-2 mm)	olivine		0.00	0.00	9.94	48.68	0.02	39.75	0.10	0.06	0.05	0.07	0.40	0.00	99.06
" 6"	98-J-14 (1-2 mm)	olivine		0.00	0.00	8.69	49.83	0.05	39.70	0.10	0.04	0.10	0.16	0.34	0.06	99.08
" 7"	98-J-14 (1-2 mm)	olivine		0.00	0.00	9.19	49.28	0.05	39.87	0.08	0.00	0.04	0.10	0.36	0.01	98.98
" 8"	98-J-14 (1-2 mm)	olivine		0.00	0.01	8.32	50.30	0.03	40.06	0.09	0.07	0.08	0.15	0.39	0.04	99.56
" 9"	98-J-14 (1-2 mm)	olivine		0.00	0.00	8.98	49.55	0.09	39.89	0.09	0.00	0.10	0.09	0.33	0.03	99.15
" 11"	98-J-14 (1-2 mm)	olivine		0.00	0.00	8.72	49.50	0.06	39.86	0.09	0.05	0.10	0.11	0.38	0.00	98.87
" 12"	98-J-14 (1-2 mm)	olivine		0.00	0.00	9.01	49.86	0.03	39.80	0.07	0.04	0.11	0.17	0.40	0.03	99.52
" 13"	98-J-14 (1-2 mm)	olivine		0.00	0.01	13.21	46.11	0.04	38.94	0.08	0.03	0.07	0.14	0.31	0.00	98.92
" 14"	98-J-14 (1-2 mm)	olivine		0.00	0.02	8.82	49.59	0.05	39.76	0.08	0.04	0.08	0.15	0.40	0.05	99.03
" 15"	98-J-14 (1-2 mm)	olivine		0.00	0.00	9.05	49.22	0.05	39.64	0.06	0.01	0.01	0.09	0.39	0.00	98.51
" 16"	98-J-14 (1-2 mm)	olivine		0.00	0.00	12.58	46.74	0.05	39.35	0.07	0.07	0.07	0.18	0.37	0.00	99.47
" 17"	98-J-14 (1-2 mm)	olivine		0.00	0.00	8.77	49.41	0.05	39.49	0.07	0.06	0.06	0.06	0.32	0.00	98.29
" 2-7"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	9.69	48.98	0.08	39.76	0.07	0.04	0.06	0.11	0.36	0.02	99.16
" 8"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	12.82	46.89	0.04	39.17	0.06	0.06	0.02	0.11	0.31	0.00	99.49
" 9"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	9.65	48.87	0.01	39.69	0.04	0.05	0.00	0.15	0.42	0.04	98.94
" 10"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.94	49.95	0.04	39.70	0.08	0.00	0.06	0.07	0.37	0.03	99.24
" 11"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	9.36	49.17	0.05	40.16	0.07	0.01	0.15	0.13	0.31	0.00	99.42
" 12"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	13.18	46.22	0.02	39.07	0.07	0.06	0.11	0.17	0.30	0.01	99.21
" 13"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	8.86	49.44	0.06	40.22	0.12	0.01	0.08	0.16	0.39	0.02	99.38
" 14"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	9.41	49.30	0.08	40.09	0.07	0.04	0.07	0.12	0.41	0.00	99.60
" 15"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.89	49.42	0.05	39.73	0.07	0.03	0.08	0.07	0.47	0.05	98.86
" 16"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	8.63	49.77	0.04	39.64	0.09	0.04	0.07	0.11	0.40	0.00	98.79
" 17"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	8.96	49.76	0.06	40.00	0.07	0.05	0.09	0.09	0.33	0.07	99.49
" 18"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	10.75	48.33	0.06	39.61	0.07	0.02	0.06	0.15	0.28	0.02	99.36
" 19"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	9.18	49.62	0.05	40.08	0.10	0.03	0.06	0.11	0.36	0.02	99.62
" 20"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	9.46	48.54	0.11	40.16	0.09	0.05	0.08	0.13	0.39	0.00	99.02
" 21"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.70	49.55	0.09	39.55	0.12	0.00	0.12	0.08	0.37	0.00	98.58
" 22"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	9.51	49.48	0.05	40.24	0.10	0.02	0.04	0.10	0.37	0.03	99.94
" 23"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	9.06	49.52	0.04	39.50	0.08	0.01	0.02	0.12	0.38	0.01	98.74
" 24"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	9.36	49.44	0.08	40.30	0.10	0.00	0.08	0.15	0.34	0.00	99.84
" 25"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	9.20	49.78	0.08	40.02	0.07	0.01	0.02	0.09	0.40	0.07	99.74
" 26"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.69	49.83	0.07	39.91	0.05	0.05	0.07	0.12	0.37	0.05	99.21
" 27"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	9.32	49.93	0.04	40.13	0.07	0.04	0.07	0.11	0.32	0.01	100.06
" 28"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	8.78	49.91	0.05	40.07	0.07	0.04	0.05	0.14	0.32	0.00	99.44
" 30"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.72	49.97	0.06	39.87	0.08	0.00	0.10	0.07	0.43	0.04	99.34
" 31"	98-J-14 (0.5-1mm)	olivine		0.00	0.02	9.06	49.64	0.05	40.00	0.05	0.03	0.02	0.08	0.40	0.01	99.35
" 32"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	10.31	48.66	0.05	39.81	0.09	0.05	0.09	0.13	0.34	0.04	99.56
" 33"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	9.12	49.02	0.05	39.84	0.08	0.06	0.19	0.15	0.34	0.01	98.86
" 34"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.64	49.99	0.05	40.05	0.06	0.02	0.04	0.17	0.37	0.00	99.39
" 35"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	13.65	45.64	0.04	39.13	0.06	0.06	0.07	0.10	0.22	0.02	98.98

Appendix E.2
Mineral chemistry for all picked grains
SILICATES

Grain	Sample ID	Mineral	Comments	Na2O	K2O	FeO	MgO	Al2O3	SiO2	CaO	TiO2	Cr2O3	MnO	NiO	V2O3	TOTAL
" 36"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	8.56	49.99	0.05	39.84	0.11	0.00	0.06	0.09	0.45	0.03	99.19
" 37"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.43	49.74	0.09	39.96	0.06	0.01	0.08	0.12	0.44	0.00	98.94
" 38"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	9.96	48.52	0.02	39.92	0.10	0.05	0.06	0.06	0.41	0.02	99.11
" 39"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	8.95	49.97	0.44	40.28	0.09	0.02	0.03	0.09	0.42	0.00	100.30
" 40"	98-J-14 (0.5-1mm)	olivine		0.00	0.03	9.11	49.05	0.04	39.61	0.08	0.04	0.05	0.08	0.35	0.00	98.43
" 41"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.26	49.91	0.04	39.77	0.05	0.00	0.08	0.14	0.43	0.06	98.74
" 42"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.92	49.52	0.08	39.91	0.08	0.02	0.08	0.09	0.37	0.00	99.05
" 43"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	8.30	49.10	0.31	39.30	0.11	0.03	0.07	0.14	0.32	0.00	97.69
" 44"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.82	49.48	0.09	40.48	0.10	0.04	0.13	0.10	0.34	0.00	99.58
" 45"	98-J-14 (0.5-1mm)	olivine		0.00	0.02	8.69	49.60	0.05	40.35	0.09	0.04	0.07	0.14	0.36	0.01	99.42
" 46"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	13.92	45.44	0.02	39.20	0.08	0.06	0.03	0.12	0.27	0.03	99.16
" 47"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	14.18	45.36	0.02	39.25	0.10	0.06	0.07	0.12	0.26	0.00	99.43
" 48"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	9.14	49.52	0.06	40.17	0.07	0.06	0.01	0.11	0.40	0.00	99.55
" 49"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	9.37	49.34	0.04	39.93	0.08	0.03	0.03	0.16	0.32	0.01	99.31
" 50"	98-J-14 (0.5-1mm)	olivine		0.00	0.02	12.52	46.71	0.03	39.64	0.09	0.04	0.11	0.20	0.29	0.01	99.66
" 51"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	9.62	48.57	0.04	39.69	0.12	0.00	0.11	0.13	0.36	0.04	98.67
" 52"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	8.61	50.30	0.04	40.24	0.08	0.01	0.10	0.10	0.36	0.00	99.84
" 53"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	8.01	50.35	0.07	39.81	0.06	0.03	0.10	0.11	0.33	0.00	98.89
" 54"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	13.72	45.65	0.04	38.84	0.09	0.08	0.00	0.15	0.22	0.01	98.79
" 55"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	9.12	49.79	0.06	40.19	0.07	0.05	0.02	0.14	0.43	0.04	99.91
" 56"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.47	50.03	0.03	40.16	0.07	0.02	0.04	0.10	0.32	0.00	99.24
" 57"	98-J-14 (0.5-1mm)	olivine		0.00	0.02	8.52	49.94	0.07	40.16	0.06	0.03	0.06	0.14	0.39	0.00	99.38
" 58"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.34	49.96	0.12	40.06	0.09	0.01	0.04	0.13	0.36	0.00	99.12
" 59"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	8.76	49.85	0.05	40.07	0.06	0.06	0.11	0.10	0.40	0.05	99.52
" 60"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	12.13	46.86	0.05	39.12	0.09	0.01	0.11	0.12	0.24	0.03	98.77
" 61"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	13.93	45.45	0.02	38.86	0.07	0.03	0.02	0.18	0.22	0.01	98.79
" 62"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.69	50.02	0.06	40.04	0.07	0.02	0.07	0.09	0.38	0.04	99.48
" 63"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.64	49.56	0.05	40.15	0.08	0.04	0.11	0.14	0.42	0.00	99.19
" 64"	98-J-14 (0.5-1mm)	olivine		0.00	0.02	14.05	45.64	0.00	39.15	0.07	0.03	0.03	0.17	0.20	0.06	99.42
" 65"	98-J-14 (0.5-1mm)	olivine		0.00	0.03	13.07	46.22	0.01	39.02	0.11	0.02	0.08	0.15	0.24	0.00	98.95
" 66"	98-J-14 (0.5-1mm)	olivine		0.00	0.02	10.80	47.96	0.05	39.39	0.09	0.06	0.06	0.14	0.33	0.00	98.90
" 67"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.89	49.81	0.06	39.81	0.07	0.00	0.09	0.11	0.34	0.04	99.22
" 68"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.69	49.49	0.06	39.82	0.12	0.00	0.08	0.10	0.39	0.02	98.79
" 69"	98-J-14 (0.5-1mm)	olivine		0.00	0.01	8.45	50.12	0.05	39.85	0.06	0.00	0.07	0.10	0.36	0.02	99.08
" 70"	98-J-14 (0.5-1mm)	olivine		0.00	0.00	8.34	49.92	0.03	40.03	0.06	0.03	0.06	0.15	0.38	0.03	99.02
" 4-181"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	13.70	46.23	0.06	39.59	0.09	0.04	0.11	0.19	0.28	0.03	100.31
" 182"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.04	13.19	46.34	0.03	39.44	0.06	0.04	0.10	0.21	0.24	0.06	99.75
" 183"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	8.93	50.06	0.06	40.50	0.10	0.04	0.14	0.15	0.37	0.00	100.35
" 184"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	14.15	45.76	0.00	39.58	0.10	0.07	0.08	0.16	0.28	0.01	100.19
" 185"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	12.12	47.31	0.02	39.77	0.11	0.01	0.07	0.17	0.31	0.04	99.92
" 187"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	8.71	49.93	0.05	40.30	0.07	0.02	0.07	0.11	0.40	0.00	99.67
" 188"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	12.93	46.70	0.03	39.42	0.08	0.02	0.05	0.12	0.27	0.00	99.62
" 189"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.02	12.40	46.91	0.05	39.55	0.06	0.03	0.08	0.17	0.34	0.02	99.64

Appendix E.2
Mineral chemistry for all picked grains
SILICATES

Grain	Sample ID	Mineral	Comments	Na2O	K2O	FeO	MgO	Al2O3	SiO2	CaO	TiO2	Cr2O3	MnO	NiO	V2O3	TOTAL
" 190"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	13.62	45.97	0.05	39.60	0.10	0.04	0.00	0.15	0.24	0.00	99.77
" 191"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	13.39	45.88	0.03	39.57	0.09	0.01	0.09	0.15	0.25	0.01	99.48
" 192"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	9.48	49.49	0.04	40.10	0.09	0.01	0.09	0.15	0.42	0.07	99.96
" 193"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.03	9.51	49.54	0.08	40.33	0.12	0.03	0.11	0.18	0.36	0.01	100.30
" 194"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	9.56	48.86	0.06	40.11	0.10	0.02	0.14	0.10	0.37	0.00	99.33
" 195"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	12.59	46.75	0.05	39.49	0.08	0.04	0.10	0.13	0.24	0.02	99.51
" 196"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	13.92	45.75	0.02	39.17	0.10	0.06	0.03	0.13	0.23	0.00	99.41
" 197"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.02	14.01	45.22	0.04	39.62	0.07	0.06	0.09	0.19	0.27	0.02	99.62
" 198"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	12.48	47.08	0.03	39.39	0.06	0.04	0.06	0.17	0.31	0.00	99.62
" 199"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	13.87	46.18	0.03	39.81	0.09	0.03	0.04	0.12	0.31	0.00	100.48
" 200"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.03	8.72	49.62	0.07	40.91	0.07	0.08	0.08	0.07	0.39	0.00	100.03
" 201"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	10.37	49.10	0.06	40.29	0.10	0.07	0.07	0.16	0.26	0.00	100.49
" 202"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	9.11	49.39	0.06	40.56	0.08	0.04	0.09	0.08	0.38	0.05	99.84
" 203"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.02	13.16	46.41	0.03	39.78	0.11	0.07	0.03	0.19	0.17	0.00	99.97
" 204"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	13.86	45.73	0.06	39.29	0.09	0.03	0.05	0.07	0.17	0.01	99.37
" 205"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	12.80	46.76	0.06	39.42	0.09	0.07	0.02	0.12	0.25	0.00	99.58
" 206"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	9.87	49.31	0.09	40.60	0.09	0.05	0.01	0.11	0.40	0.04	100.58
" 207"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	13.41	46.51	0.03	39.88	0.08	0.05	0.08	0.15	0.30	0.02	100.51
" 208"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	13.50	46.39	0.51	40.17	0.06	0.09	0.04	0.10	0.17	0.00	101.05
" 209"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	13.10	46.30	0.09	39.69	0.11	0.05	0.07	0.12	0.30	0.00	99.82
" 210"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	8.88	49.91	0.07	40.98	0.10	0.00	0.06	0.08	0.35	0.04	100.46
" 211"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	9.24	49.58	0.03	40.54	0.08	0.04	0.12	0.08	0.34	0.00	100.05
" 212"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	11.68	47.39	0.02	39.79	0.07	0.05	0.10	0.14	0.30	0.00	99.54
" 213"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	13.28	46.37	0.04	39.55	0.06	0.07	0.08	0.22	0.22	0.05	99.94
" 214"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	9.27	49.71	0.05	40.83	0.07	0.02	0.04	0.10	0.36	0.02	100.45
" 215"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	11.78	47.65	0.08	39.80	0.07	0.04	0.00	0.15	0.30	0.01	99.89
" 216"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	14.17	45.80	0.06	39.73	0.04	0.06	0.02	0.13	0.18	0.00	100.21
" 217"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	9.96	49.32	0.03	40.57	0.07	0.02	0.17	0.14	0.35	0.04	100.69
" 218"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	12.16	47.48	0.02	39.67	0.06	0.00	0.07	0.10	0.33	0.02	99.91
" 219"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	9.86	49.03	0.05	39.48	0.08	0.04	0.03	0.19	0.39	0.00	99.15
" 220"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	10.35	48.91	0.07	40.32	0.09	0.05	0.08	0.15	0.35	0.04	100.40
" 221"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	10.29	48.70	0.04	40.36	0.06	0.05	0.10	0.15	0.32	0.03	100.10
" 222"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	11.56	47.69	0.03	39.72	0.09	0.04	0.01	0.20	0.29	0.02	99.65
" 223"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	8.85	49.72	0.02	40.46	0.07	0.01	0.07	0.12	0.40	0.00	99.73
" 224"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	9.57	49.04	0.08	40.14	0.10	0.00	0.10	0.10	0.42	0.00	99.54
" 225"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	7.93	50.70	0.06	40.91	0.09	0.07	0.09	0.16	0.37	0.03	100.43
" 226"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	9.82	49.44	0.06	40.50	0.11	0.09	0.07	0.16	0.33	0.06	100.66
" 227"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	12.91	46.64	0.04	39.45	0.10	0.05	0.04	0.16	0.32	0.04	99.76
" 228"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	13.77	45.87	0.06	39.77	0.03	0.06	0.00	0.09	0.21	0.00	99.87
" 229"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	10.52	48.34	0.03	40.02	0.10	0.07	0.10	0.08	0.34	0.05	99.65
" 230"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	9.13	49.58	0.05	40.62	0.09	0.04	0.08	0.11	0.33	0.02	100.05
" 231"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	9.02	49.79	0.04	40.37	0.12	0.02	0.10	0.11	0.38	0.04	99.97
" 232"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	9.49	48.61	0.08	39.83	0.12	0.03	0.10	0.15	0.35	0.03	98.79

Appendix E.2
Mineral chemistry for all picked grains
SILICATES

Grain	Sample ID	Mineral	Comments	Na2O	K2O	FeO	MgO	Al2O3	SiO2	CaO	TiO2	Cr2O3	MnO	NiO	V2O3	TOTAL
" 233"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	14.44	45.32	0.05	39.38	0.05	0.06	0.00	0.17	0.25	0.00	99.71
" 234"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	10.52	48.26	0.05	40.11	0.12	0.05	0.08	0.13	0.27	0.02	99.59
" 235"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	9.25	49.57	0.09	40.54	0.10	0.02	0.13	0.12	0.36	0.00	100.17
" 236"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	14.17	45.56	0.04	39.37	0.05	0.05	0.03	0.21	0.24	0.01	99.74
" 237"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.01	12.36	47.01	0.04	39.98	0.09	0.02	0.04	0.14	0.32	0.03	100.04
" 238"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	10.52	48.51	0.06	39.85	0.08	0.05	0.09	0.12	0.31	0.02	99.61
" 239"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	8.58	49.69	0.04	40.48	0.03	0.01	0.12	0.11	0.38	0.02	99.45
" 240"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.02	9.61	49.49	0.06	40.67	0.10	0.03	0.09	0.10	0.35	0.05	100.56
" 242"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	13.56	45.92	0.03	39.52	0.09	0.01	0.02	0.14	0.23	0.00	99.52
" 243"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.02	12.83	46.58	0.06	40.11	0.06	0.06	0.04	0.14	0.30	0.02	100.24
" 244"	98-J-14 (0.25-0.5mm)	olivine		0.00	0.00	12.82	46.42	0.04	39.53	0.08	0.02	0.06	0.12	0.24	0.06	99.40
Rankin Inlet till samples (0.5-1 mm):																
" 2-74"	97MOB0106	Mg, Ca almandine	crustal	0.00	0.00	25.52	6.37	21.34	37.44	6.77	0.10	0.01	0.65	0.00	0.01	98.20
" 76"	97MOB0127	Mg, Ca almandine	crustal	0.00	0.01	25.78	7.08	21.22	37.40	5.69	0.22	0.05	0.57	0.00	0.00	98.03
" 2-78"	97MOB0138	Mg, Ca almandine	crustal	0.00	0.00	26.93	6.65	21.29	37.65	5.62	0.14	0.09	0.60	0.05	0.00	99.02
" 79"	97MOB0161	titanite		0.00	0.00	0.42	0.00	1.47	30.45	27.18	38.24	0.04	0.05	0.00	0.35	98.19
" 80"	**98MOB0008**	**olivine**		0.00	0.00	8.40	49.91	0.01	39.63	0.06	0.03	0.05	0.12	0.35	0.02	98.58
" 81"	**98MOB0008**	**olivine**		0.00	0.01	9.01	49.42	0.07	39.91	0.07	0.02	0.01	0.12	0.38	0.00	99.03
" 82"	98MOB0061	Mn almandine	crustal	0.00	0.01	29.68	1.57	20.19	35.51	0.90	0.01	0.03	10.50	0.00	0.00	98.40
" 84"	98MOB0074	Ca almandine-pyrope	crustal	0.00	0.01	20.60	11.35	21.85	38.59	5.31	0.14	0.05	0.79	0.00	0.04	98.74
" 85"	98MOB0074	Mg, Ca almandine	crustal	0.00	0.01	25.62	6.21	21.33	37.67	7.08	0.20	0.02	0.62	0.02	0.11	98.88
" 86"	98MOB0074	almandine-pyrope	crustal	0.00	0.00	25.39	8.91	21.84	37.86	3.63	0.19	0.04	0.59	0.00	0.02	98.47
" 87"	98MOB0075	Mg, Ca almandine	crustal	0.00	0.01	22.35	7.31	21.60	38.09	8.36	0.17	0.00	0.48	0.00	0.00	98.37
" 88"	98MOB0099	Fe grossular	crustal	0.00	0.00	6.86	0.08	20.36	38.31	30.87	0.20	0.00	0.74	0.04	0.03	97.50
" 89"	98MOB0099	Fe, Mn grossular	crustal	0.00	0.01	6.23	0.05	20.16	38.27	31.09	0.33	0.00	1.05	0.00	0.06	97.26
" 90"	98MOB0099	Mg, Ca almandine	crustal	0.00	0.00	21.52	6.71	21.56	38.13	9.69	0.14	0.01	0.72	0.02	0.01	98.50
" 91"	98MOB0099	Fe grossular	crustal	0.00	0.00	5.38	0.14	19.16	38.51	33.72	0.08	0.00	0.10	0.07	0.05	97.22
" 92"	98MOB0099	Fe grossular	crustal	0.00	0.03	8.19	0.07	20.03	38.02	30.27	0.17	0.00	0.36	0.05	0.03	97.22
" 2-94"	98MOB0128	Mg, Ca almandine	crustal	0.00	0.00	24.29	6.81	21.24	37.53	7.47	0.14	0.00	0.55	0.00	0.06	98.09
" 95"	**98MOB0148**	**olivine**		0.00	0.01	7.30	51.10	0.07	40.11	0.07	0.02	0.13	0.15	0.38	0.00	99.33
" 2-98"	98MOB0180	epidote		0.00	0.00	6.97	0.05	27.49	37.56	22.51	0.02	0.09	0.05	0.00	0.00	94.75
" 99"	98MOB0193	Mg, Ca almandine	crustal	0.00	0.00	23.82	6.69	21.44	37.62	7.79	0.20	0.00	0.56	0.01	0.07	98.22
" 100"	98MOB0205	almandine-pyrope	crustal	0.00	0.00	22.29	9.61	21.53	38.31	5.55	0.15	0.06	0.70	0.00	0.07	98.25
" 101"	98MOB0210	almandine-pyrope	crustal	0.00	0.01	23.56	8.02	21.48	37.58	6.86	0.08	0.02	0.58	0.02	0.00	98.21
Rankin Inlet till samples (0.25-0.5mm):																
" 3-1"	97MOB0097	almandine-grossular	crustal	0.00	0.02	27.18	2.21	20.96	37.11	10.65	0.23	0.00	0.20	0.00	0.00	98.56
" 2"	97MOB0097	almandine-pyrope	crustal	0.00	0.00	22.26	8.98	21.76	38.30	7.08	0.21	0.02	0.42	0.00	0.02	99.06
" 3-4"	97MOB0106	almandine-pyrope	crustal	0.00	0.00	24.30	8.21	21.82	37.82	5.55	0.15	0.01	0.59	0.04	0.08	98.58
" 5"	97MOB0106	Ca, Mg almandine	crustal	0.00	0.02	25.50	6.06	21.03	37.83	7.73	0.14	0.00	0.58	0.04	0.09	99.02
" 6"	97MOB0106	Mn, Ca, Mg almandine	crustal	0.00	0.02	26.44	4.09	21.40	37.23	8.25	0.17	0.02	1.10	0.02	0.03	98.76
" 7"	97MOB0106	almandine-pyrope	crustal	0.00	0.00	23.10	8.18	21.66	38.33	6.62	0.27	0.04	0.42	0.00	0.08	98.70

Appendix E.2
Mineral chemistry for all picked grains
SILICATES

Grain	Sample ID	Mineral	Comments	Na2O	K2O	FeO	MgO	Al2O3	SiO2	CaO	TiO2	Cr2O3	MnO	NiO	V2O3	TOTAL
" 8"	97MOB0106	almandine-pyrope	crustal	0.00	0.01	23.11	8.70	21.55	38.40	6.25	0.13	0.02	0.58	0.00	0.01	98.74
" 9"	**97MOB0106**	**Ca pyrope-almandine**	**mantle?**	0.00	0.01	16.58	14.43	22.49	39.47	4.97	0.12	0.20	0.39	0.02	0.05	98.72
" 10"	97MOB0106	Mg, Ca almandine	crustal	0.00	0.00	25.98	6.82	21.85	37.43	5.67	0.16	0.00	0.79	0.00	0.05	98.76
" 11"	97MOB0106	Mg, Ca almandine	crustal	0.00	0.00	25.94	6.07	21.25	37.68	7.37	0.14	0.01	0.67	0.00	0.00	99.13
" 12"	**97MOB0106**	**Ca almandine-pyrope**	**mantle?**	0.00	0.00	20.22	9.94	22.26	38.60	7.21	0.25	0.03	0.38	0.04	0.05	99.00
" 13"	97MOB0106	Ca, Mg almandine	crustal	0.00	0.03	30.13	4.17	20.82	36.98	6.17	0.17	0.06	0.52	0.02	0.02	99.07
" 14"	97MOB0106	almandine-pyrope	crustal	0.00	0.01	24.11	8.53	21.71	38.36	5.81	0.24	0.02	0.42	0.03	0.01	99.24
" 15"	97MOB0106	Mn almandine-grossular	crustal	0.00	0.01	24.47	0.90	20.50	36.75	11.74	0.24	0.00	4.11	0.01	0.00	98.73
" 16"	97MOB0106	Mg, Ca almandine	crustal	0.00	0.01	24.85	6.88	21.40	37.76	6.98	0.08	0.03	0.63	0.01	0.03	98.65
" 17"	97MOB0106	almandine-pyrope	crustal	0.00	0.00	23.89	8.69	21.85	38.22	5.34	0.19	0.07	0.28	0.00	0.06	98.58
" 18"	97MOB0106	almandine-pyrope	crustal	0.00	0.02	23.53	8.48	21.32	38.48	6.19	0.21	0.05	0.67	0.01	0.09	99.04
" 19"	97MOB0106	almandine-pyrope	crustal	0.00	0.01	25.79	8.06	21.76	38.03	4.26	0.11	0.04	0.94	0.04	0.00	99.05
" 20"	97MOB0106	Mg, Ca almandine	crustal	0.00	0.02	27.88	5.59	21.25	37.57	6.23	0.08	0.00	0.85	0.02	0.02	99.53
" 21"	97MOB0106	Ca, Mg almandine	crustal	0.00	0.01	34.72	3.55	20.87	36.64	2.66	0.02	0.04	0.39	0.03	0.00	98.94
" 22"	97MOB0106	Mg, Ca almandine	crustal	0.00	0.00	34.48	2.95	20.74	36.71	3.82	0.14	0.05	0.26	0.00	0.00	99.14
" 23"	**97MOB0106**	**Ca almandine-pyrope**	**mantle?**	0.00	0.00	21.49	9.88	21.87	38.60	5.90	0.18	0.04	0.48	0.01	0.02	98.47
" 24"	97MOB0106	Mg, Ca almandine	crustal	0.00	0.02	26.48	6.73	21.33	37.97	6.05	0.09	0.07	0.74	0.02	0.04	99.53
" 25"	97MOB0106	almandine-pyrope	crustal	0.00	0.00	23.60	7.91	21.59	38.22	6.48	0.07	0.08	0.86	0.07	0.01	98.90
" 26"	97MOB0106	Mg, Ca almandine	crustal	0.00	0.02	26.07	6.30	21.27	37.63	6.56	0.15	0.08	0.65	0.00	0.01	98.74
" 27"	97MOB0106	Mn almandine	crustal	0.00	0.00	27.67	3.41	21.18	37.16	8.48	0.13	0.03	1.29	0.05	0.04	99.44
" 28"	**97MOB0106**	**Ca pyrope-almandine**	**mantle?**	0.00	0.00	19.62	10.66	22.17	38.83	6.57	0.16	0.04	0.40	0.00	0.00	98.45
" 29"	97MOB0106	Mg, Ca almandine	crustal	0.00	0.03	25.96	6.19	21.26	37.85	7.06	0.16	0.00	0.72	0.00	0.00	99.23
" 30"	97MOB0106	Mg, Ca almandine	crustal	0.00	0.00	23.41	6.99	21.32	38.30	7.90	0.22	0.00	0.57	0.00	0.05	98.76
" 31"	**97MOB0106**	**Ca almandine-pyrope**	**mantle?**	0.00	0.00	22.01	9.30	21.69	38.60	6.77	0.17	0.00	0.53	0.05	0.04	99.16
" 32"	97MOB0106	Ca, Mg almandine	crustal	0.00	0.01	31.20	1.28	20.65	36.72	7.87	0.11	0.00	1.20	0.01	0.05	99.09
" 33"	97MOB0106	Ca almandine-pyrope	crustal	0.00	0.00	20.31	11.01	21.86	39.18	5.91	0.14	0.12	0.49	0.00	0.05	99.08
" 34"	**97MOB0106**	**Ca almandine-pyrope**	**mantle?**	0.00	0.00	21.96	9.85	21.69	38.58	5.74	0.17	0.00	0.58	0.06	0.00	98.65
" 35"	97MOB0106	almandine-pyrope	crustal	0.00	0.00	22.49	8.96	21.82	38.38	6.37	0.16	0.06	0.31	0.01	0.00	98.55
" 36"	97MOB0106	almandine-pyrope	crustal	0.00	0.00	25.28	9.30	22.14	38.44	3.34	0.12	0.04	0.61	0.01	0.04	99.33
" 37"	97MOB0106	almandine-pyrope	crustal	0.00	0.00	23.57	9.01	21.43	38.39	5.54	0.08	0.07	0.59	0.00	0.00	98.67
" 38"	97MOB0106	almandine-pyrope	crustal	0.00	0.01	23.56	9.06	21.66	38.40	5.82	0.12	0.04	0.45	0.01	0.01	99.16
" 39"	**97MOB0106**	**Cr-diopside**		0.77	0.02	4.30	15.47	2.29	52.60	21.12	0.10	1.10	0.12	0.06	0.00	97.94
" 40"	97MOB0106	epidote		0.01	0.01	8.69	0.08	25.94	37.27	22.58	0.03	0.06	0.10	0.03	0.00	94.82
" 41"	**97MOB0106**	**olivine**		0.00	0.03	9.05	48.31	0.33	38.93	0.09	0.01	0.10	0.14	0.36	0.00	97.35
" 3-45"	97MOB0107	Mg, Ca almandine	crustal	0.00	0.01	26.34	5.25	20.63	37.38	7.44	0.16	0.02	0.66	0.00	0.03	97.93
" 46"	97MOB0107	almandine-grossular	crustal	0.00	0.00	28.19	1.00	20.78	36.66	11.58	0.10	0.01	0.09	0.01	0.02	98.44
" 47"	97MOB0107	almandine-pyrope	crustal	0.00	0.03	25.17	7.79	21.38	38.03	5.68	0.17	0.07	0.87	0.03	0.08	99.30
" 48"	97MOB0107	Mg, Ca almandine	crustal	0.00	0.01	24.35	6.61	21.35	37.64	7.39	0.17	0.07	0.40	0.00	0.03	98.03
" 49"	97MOB0107	Ca, Mg almandine	crustal	0.00	0.00	24.16	5.23	21.06	37.58	9.75	0.17	0.02	0.47	0.00	0.02	98.46
" 50"	97MOB0107	almandine-pyrope	crustal	0.00	0.00	23.40	7.59	21.64	37.98	7.50	0.17	0.03	0.33	0.00	0.07	98.73
" 51"	97MOB0107	Ca, Mg almandine	crustal	0.00	0.00	24.05	5.33	21.66	37.74	9.56	0.10	0.00	0.51	0.03	0.08	99.07
" 52"	97MOB0107	almandine-pyrope	crustal	0.00	0.00	23.26	8.18	21.71	38.24	6.85	0.19	0.00	0.50	0.01	0.00	98.94
" 53"	97MOB0107	Mg almandine-grossular	crustal	0.12	0.03	22.22	5.40	21.29	37.83	10.66	0.12	0.00	0.47	0.00	0.01	98.14

Appendix E.2
Mineral chemistry for all picked grains
SILICATES

Grain	Sample ID	Mineral	Comments	Na2O	K2O	FeO	MgO	Al2O3	SiO2	CaO	TiO2	Cr2O3	MnO	NiO	V2O3	TOTAL
" 54"	97MOB0107	Mg, Ca almandine	crustal	0.00	0.00	25.99	7.27	21.32	37.54	5.66	0.13	0.00	0.73	0.02	0.07	98.73
" 55"	97MOB0107	spessartine-almandine	crustal	0.00	0.01	16.00	0.57	18.78	35.29	3.07	0.36	0.02	22.32	0.02	0.03	96.46
" 56"	97MOB0107	grossular-almandine	crustal	0.00	0.00	12.75	0.08	13.64	37.38	31.89	0.63	0.02	0.38	0.00	0.02	96.80
" 57"	97MOB0107	almandine-pyrope	crustal	0.00	0.00	22.93	8.79	21.95	38.35	6.23	0.20	0.04	0.54	0.01	0.09	99.14
" 58"	97MOB0107	Mn, Mg, Ca almandine	crustal	0.00	0.00	28.56	4.86	21.10	37.56	5.03	0.03	0.09	2.20	0.01	0.02	99.46
" 59"	97MOB0107	spessartine-almandine	crustal	0.00	0.00	19.23	1.28	20.56	35.90	1.50	0.03	0.00	20.07	0.03	0.00	98.60
" 60"	97MOB0107	Ca, Mg almandine	crustal	0.00	0.00	34.87	1.66	20.48	36.10	4.62	0.07	0.00	0.65	0.00	0.00	98.46
" 61"	97MOB0107	almandine-pyrope	crustal	0.00	0.01	22.10	9.32	21.84	38.80	6.44	0.19	0.07	0.52	0.00	0.04	99.32
" 62"	**97MOB0107**	**Ca almandine-pyrope**	**mantle?**	0.00	0.01	22.00	9.71	21.52	38.09	5.95	0.26	0.00	0.51	0.00	0.05	98.10
" 63"	97MOB0107	Ca, Mg almandine	crustal	0.00	0.00	29.57	4.29	20.85	37.56	6.22	0.16	0.11	0.67	0.00	0.03	99.45
" 64"	97MOB0107	Ca, Mg almandine	crustal	0.00	0.03	29.74	3.77	20.85	36.62	6.41	0.13	0.02	0.69	0.00	0.05	98.32
" 65"	97MOB0107	almandine-pyrope	crustal	0.00	0.02	22.33	8.00	21.63	38.20	7.89	0.15	0.01	0.43	0.07	0.06	98.77
" 66"	97MOB0107	Mg, Ca almandine	crustal	0.00	0.01	25.13	6.93	21.05	37.84	6.51	0.11	0.00	0.60	0.02	0.07	98.25
" 67"	97MOB0107	Mn almandine-grossular	crustal	0.00	0.01	27.30	0.74	20.55	36.99	10.82	0.11	0.01	2.81	0.00	0.03	99.36
" 68"	97MOB0107	Mg, Ca almandine	crustal	0.00	0.02	26.06	6.35	21.19	37.52	6.42	0.21	0.05	0.57	0.01	0.13	98.53
" 69"	97MOB0107	Mg, Ca almandine	crustal	0.00	0.00	24.58	6.98	21.43	38.24	7.27	0.23	0.09	0.53	0.00	0.06	99.42
" 70"	97MOB0107	Ca, Mg spessartine-almandine	crustal	0.00	0.00	17.72	1.33	20.65	36.23	4.80	0.03	0.05	17.69	0.03	0.00	98.51
" 71"	97MOB0107	almandine-pyrope	crustal	0.00	0.00	23.26	8.17	21.66	38.15	6.86	0.15	0.10	0.51	0.00	0.03	98.88
" 72"	97MOB0107	almandine-pyrope	crustal	0.00	0.02	23.50	8.92	21.88	38.43	5.32	0.22	0.01	0.38	0.06	0.04	98.76
" 73"	97MOB0107	almandine-pyrope	crustal	0.00	0.00	23.93	8.53	21.62	38.49	5.62	0.12	0.00	0.57	0.05	0.03	98.95
" 74"	97MOB0107	Mg, Ca almandine	crustal	0.00	0.01	30.54	4.68	21.09	37.51	5.26	0.00	0.00	0.45	0.04	0.06	99.64
" 75"	97MOB0107	Mg, Ca almandine	crustal	0.00	0.01	24.94	7.26	21.65	38.16	6.03	0.18	0.03	0.61	0.00	0.01	98.89
" 76"	97MOB0107	Mg, Ca almandine	crustal	0.00	0.01	25.89	7.05	21.27	37.64	6.10	0.11	0.00	0.62	0.02	0.09	98.81
" 77"	97MOB0107	spessartine-almandine	crustal	0.00	0.00	16.37	1.49	20.17	36.14	0.62	0.12	0.00	23.26	0.05	0.00	98.23
" 78"	97MOB0107	epidote		0.00	0.00	10.28	0.10	24.20	37.12	22.54	0.45	0.05	0.11	0.01	0.24	95.11
" 3-80"	97MOB0123	Mg, Ca almandine	crustal	0.00	0.01	24.89	6.62	21.30	37.81	7.11	0.13	0.01	0.63	0.00	0.07	98.58
" 81"	97MOB0123	Mg, Ca almandine	crustal	0.00	0.01	22.95	7.34	21.50	37.84	8.05	0.17	0.01	0.57	0.00	0.01	98.47
" 82"	97MOB0123	Mn almandine-grossular	crustal	0.00	0.00	25.57	0.88	20.65	36.83	12.35	0.04	0.01	1.59	0.04	0.00	97.96
" 83"	97MOB0123	Mg, Ca almandine	crustal	0.00	0.01	25.34	6.45	21.27	37.79	6.95	0.11	0.02	0.69	0.02	0.03	98.67
" 84"	97MOB0123	Mg, Ca almandine	crustal	0.00	0.00	35.26	3.73	20.87	35.99	2.29	0.02	0.08	0.37	0.00	0.08	98.70
" 85"	**97MOB0123**	**Ca almandine-pyrope**	**mantle?**	0.00	0.00	20.92	10.09	21.98	38.93	6.18	0.19	0.00	0.35	0.03	0.00	98.66
" 86"	97MOB0123	almandine-pyrope	crustal	0.00	0.00	24.57	8.79	21.86	38.09	5.11	0.13	0.06	0.60	0.03	0.04	99.30
" 87"	97MOB0123	Mg, Ca almandine	crustal	0.00	0.01	26.53	6.20	21.40	37.53	6.21	0.20	0.00	0.54	0.04	0.04	98.69
" 88"	97MOB0123	Mg, Ca almandine	crustal	0.00	0.00	26.33	6.26	21.24	37.89	6.62	0.27	0.00	0.62	0.00	0.02	99.24
" 89"	97MOB0123	Mg, Ca almandine	crustal	0.02	0.03	24.48	7.15	21.44	38.23	6.99	0.17	0.03	0.50	0.00	0.12	99.14
" 90"	97MOB0123	almandine-pyrope	crustal	0.00	0.03	23.99	8.09	21.60	38.22	6.39	0.07	0.05	0.75	0.05	0.03	99.25
" 91"	**97MOB0123**	**Ca almandine-pyrope**	**mantle?**	0.00	0.01	20.94	9.95	21.96	38.70	6.47	0.13	0.11	0.80	0.03	0.00	99.10
" 92"	97MOB0123	almandine-pyrope	crustal	0.00	0.00	24.14	8.55	21.83	38.25	5.15	0.12	0.06	0.35	0.00	0.04	98.49
" 93"	97MOB0123	Mn almandine-grossular	crustal	0.00	0.00	27.58	0.83	20.39	36.77	10.53	0.12	0.03	2.30	0.00	0.00	98.54
" 94"	**97MOB0123**	**Ca almandine-pyrope**	**mantle?**	0.00	0.01	19.96	9.32	21.92	38.28	8.20	0.22	0.02	0.37	0.03	0.00	98.33
" 95"	97MOB0123	Mg, Ca almandine	crustal	0.00	0.00	25.40	7.42	21.64	37.89	6.22	0.10	0.00	0.54	0.00	0.06	99.28
" 96"	**97MOB0123**	**Ca almandine-pyrope**	**mantle?**	0.00	0.01	21.83	8.99	21.88	38.49	6.63	0.20	0.05	0.53	0.00	0.05	98.66
" 97"	97MOB0123	Mg, Ca almandine	crustal	0.00	0.00	24.64	6.24	21.54	37.87	7.64	0.12	0.01	0.61	0.00	0.05	98.73

Appendix E.2
Mineral chemistry for all picked grains
SILICATES

Grain	Sample ID	Mineral	Comments	Na2O	K2O	FeO	MgO	Al2O3	SiO2	CaO	TiO2	Cr2O3	MnO	NiO	V2O3	TOTAL
" 98"	97MOB0123	almandine-pyrope	crustal	0.00	0.00	22.21	8.86	21.79	38.40	7.07	0.17	0.04	0.63	0.00	0.04	99.21
" 99"	**97MOB0123**	**Ca pyrope-almandine**	**mantle?**	0.00	0.00	16.39	12.99	22.38	39.24	6.84	0.16	0.09	0.45	0.01	0.00	98.55
" 100"	97MOB0123	Mn almandine	crustal	0.00	0.01	25.00	3.23	21.36	37.40	9.69	0.14	0.08	1.98	0.00	0.00	98.89
" 101"	97MOB0123	spessartine-almandine	crustal	0.00	0.00	15.16	0.21	19.88	35.16	1.03	0.13	0.00	25.79	0.00	0.00	97.36
" 102"	97MOB0123	almandine-pyrope	crustal	0.00	0.02	22.29	9.85	21.93	38.91	5.28	0.26	0.09	0.36	0.00	0.05	99.02
" 103"	97MOB0123	Ca, Mg almandine	crustal	0.00	0.01	23.25	7.16	21.49	38.41	8.36	0.13	0.00	0.72	0.01	0.04	99.58
" 104"	97MOB0123	Mg, Ca almandine	crustal	0.00	0.00	26.56	6.03	21.29	37.83	6.28	0.17	0.01	0.65	0.00	0.01	98.85
" 105"	97MOB0123	almandine-pyrope	crustal	0.00	0.02	25.13	7.83	21.65	37.90	5.96	0.21	0.05	0.56	0.02	0.14	99.46
" 106"	97MOB0123	Mg, Ca almandine	crustal	0.00	0.00	25.14	7.14	21.46	37.96	6.12	0.16	0.01	0.56	0.00	0.01	98.56
" 107"	97MOB0123	Ca, Mg almandine	crustal	0.00	0.00	28.76	4.20	21.10	37.18	6.60	0.20	0.00	0.49	0.09	0.06	98.68
" 108"	97MOB0123	Mg almandine grossular	crustal	0.00	0.01	20.26	5.70	21.81	37.96	11.99	0.25	0.05	0.34	0.00	0.00	98.36
" 109"	97MOB0123	Mn almandine-grossular	crustal	0.00	0.00	22.17	0.57	20.94	36.96	12.92	0.09	0.00	4.89	0.00	0.00	98.54
" 110"	97MOB0123	Mg, Ca almandine	crustal	0.00	0.00	25.45	7.27	21.20	37.50	6.31	0.14	0.03	0.63	0.00	0.03	98.55
" 111"	97MOB0123	almandine-pyrope	crustal	0.00	0.02	23.99	8.48	21.32	38.20	5.93	0.25	0.07	0.55	0.00	0.05	98.87
" 112"	**97MOB0123**	**Cr-diopside**		0.60	0.01	5.30	15.20	2.40	52.55	21.22	0.14	0.77	0.17	0.07	0.03	98.46
" 113"	**97MOB0123**	**Cr-diopside**		0.54	0.00	3.16	16.89	0.83	53.71	21.90	0.10	0.97	0.09	0.06	0.11	98.36
" 114"	97MOB0123	epidote		0.00	0.00	9.84	0.06	25.21	37.44	22.18	0.05	0.00	0.18	0.00	0.01	94.97
" 115"	97MOB0123	epidote		0.00	0.01	9.67	0.07	24.90	37.28	22.23	0.08	0.04	0.12	0.00	0.02	94.43
" 116"	97MOB0123	epidote		0.00	0.03	8.55	0.08	25.95	37.20	22.28	0.17	0.05	0.09	0.05	0.03	94.48
" 117"	97MOB0123	epidote		0.02	0.01	6.72	0.07	27.91	37.99	22.67	0.12	0.13	0.13	0.00	0.03	95.79
" 118"	97MOB0123	epidote		0.00	0.00	8.49	0.04	26.22	37.78	22.77	0.15	0.02	0.07	0.06	0.02	95.62
" 119"	97MOB0123	epidote		0.00	0.00	10.05	0.03	24.96	37.15	22.39	0.08	0.00	0.12	0.00	0.01	94.79
" 120"	97MOB0123	epidote		0.00	0.00	10.00	0.08	24.83	37.37	22.06	0.19	0.05	0.10	0.00	0.07	94.74
" 121"	97MOB0123	epidote		0.00	0.01	9.38	0.06	25.72	37.36	22.11	0.05	0.02	0.15	0.00	0.04	94.89
" 122"	97MOB0123	epidote		0.00	0.01	9.77	0.04	24.41	36.37	21.62	0.18	0.00	0.08	0.02	0.10	92.60
" 123"	97MOB0123	epidote		0.00	0.02	10.21	0.01	24.70	37.22	22.29	0.10	0.04	0.18	0.00	0.00	94.77
" 3-125"	97MOB0132	Ca, Mg almandine	crustal	0.00	0.01	27.27	4.64	20.99	37.47	7.76	0.17	0.07	0.77	0.03	0.09	99.27
" 126"	97MOB0132	spessartine-almandine	crustal	0.00	0.03	15.52	0.98	20.00	35.83	1.45	0.06	0.00	24.20	0.02	0.00	98.09
" 127"	97MOB0132	almandine-pyrope	crustal	0.00	0.00	23.33	9.01	21.60	38.48	5.59	0.16	0.05	0.55	0.01	0.04	98.81
" 128"	**97MOB0132**	**Ca pyrope-almandine**	**mantle?**	0.00	0.02	19.22	11.29	22.26	38.72	6.07	0.23	0.05	0.38	0.00	0.02	98.27
" 129"	**97MOB0132**	**Ca almandine-pyrope**	**mantle?**	0.00	0.00	21.63	10.05	21.65	38.54	5.45	0.23	0.53	0.61	0.06	0.05	98.81
" 130"	**97MOB0132**	**Ca almandine-pyrope**	**mantle?**	0.00	0.00	19.87	9.01	21.89	38.69	8.87	0.21	0.02	0.41	0.00	0.01	98.96
" 131"	97MOB0132	almandine-pyrope	crustal	0.00	0.00	24.76	7.56	21.36	37.67	6.24	0.23	0.01	0.57	0.03	0.02	98.47
" 132"	97MOB0132	almandine-pyrope	crustal	0.00	0.02	23.95	8.25	21.72	38.19	6.15	0.17	0.06	0.39	0.00	0.01	98.91
" 133"	97MOB0132	Mg, Ca almandine	crustal	0.00	0.00	23.76	7.15	21.49	37.94	7.12	0.10	0.02	0.57	0.02	0.04	98.21
" 134"	97MOB0132	almandine-pyrope	crustal	0.00	0.00	23.04	8.14	21.67	38.00	6.83	0.21	0.01	0.43	0.04	0.02	98.39
" 135"	97MOB0132	Mg, Ca almandine	crustal	0.00	0.00	31.92	4.81	21.24	36.81	3.35	0.10	0.08	0.27	0.02	0.00	98.60
" 136"	97MOB0132	almandine-pyrope	crustal	0.00	0.00	23.35	8.00	21.66	38.27	6.77	0.23	0.00	0.37	0.02	0.01	98.68
" 137"	97MOB0132	almandine-pyrope	crustal	0.00	0.00	22.17	9.08	21.89	38.54	6.53	0.20	0.03	0.47	0.00	0.07	99.00
" 138"	97MOB0132	Mg, Ca almandine	crustal	0.00	0.01	24.49	7.18	22.03	38.15	6.61	0.23	0.05	0.61	0.03	0.02	99.41
" 139"	97MOB0132	Mg, Ca almandine	crustal	0.00	0.00	26.41	6.60	21.29	37.93	5.90	0.12	0.01	0.85	0.00	0.07	99.17
" 140"	97MOB0132	almandine-pyrope	crustal	0.00	0.00	22.55	8.92	21.47	38.06	6.71	0.18	0.00	0.57	0.02	0.10	98.59
" 141"	97MOB0132	Mg, Ca almandine	crustal	0.00	0.02	25.06	7.38	21.48	37.97	6.13	0.21	0.00	0.37	0.00	0.05	98.67

Appendix E.2
Mineral chemistry for all picked grains
SILICATES

Grain	Sample ID	Mineral	Comments	Na2O	K2O	FeO	MgO	Al2O3	SiO2	CaO	TiO2	Cr2O3	MnO	NiO	V2O3	TOTAL
" 142"	97MOB0132	almandine-pyrope	crustal	0.00	0.00	23.35	7.63	21.66	38.20	7.50	0.15	0.00	0.53	0.00	0.03	99.06
" 143"	97MOB0132	almandine-pyrope	crustal	0.00	0.01	22.92	8.06	21.68	38.34	7.23	0.17	0.02	0.61	0.02	0.01	99.05
" 144"	**97MOB0132**	**Ca almandine-pyrope**	**mantle?**	0.00	0.00	21.87	9.45	21.91	38.74	6.52	0.17	0.01	0.41	0.04	0.00	99.11
" 145"	97MOB0132	Mg almandine grossular	crustal	0.00	0.00	21.88	6.19	21.56	38.07	10.10	0.12	0.00	0.44	0.04	0.03	98.41
" 146"	97MOB0132	Mn almandine-grossular	crustal	0.00	0.03	20.95	4.13	21.69	38.13	12.33	0.05	0.01	1.08	0.05	0.03	98.48
" 147"	97MOB0132	Mg, Ca almandine	crustal	0.00	0.00	23.66	7.19	21.74	37.91	7.41	0.25	0.03	0.55	0.01	0.04	98.78
" 148"	97MOB0132	Ca almandine-pyrope	crustal	0.00	0.00	20.52	10.68	21.77	38.95	5.43	0.11	0.05	0.94	0.00	0.01	98.46
" 149"	97MOB0132	Ca almandine-pyrope	crustal	0.00	0.00	19.26	12.12	21.95	38.94	5.28	0.21	0.06	0.61	0.01	0.02	98.47
" 150"	97MOB0132	almandine-pyrope	crustal	0.00	0.03	22.80	9.17	21.96	38.34	5.81	0.18	0.13	0.46	0.00	0.04	98.91
" 151"	97MOB0132	almandine-pyrope	crustal	0.00	0.02	23.95	8.38	21.62	38.10	6.15	0.32	0.04	0.64	0.00	0.05	99.27
" 152"	97MOB0132	epidote		0.00	0.00	8.29	0.06	26.19	37.52	22.38	0.09	0.00	0.04	0.02	0.03	94.60
" 153"	97MOB0132	epidote		0.04	0.01	9.99	0.02	24.86	37.21	22.18	0.07	0.31	0.09	0.01	0.04	94.83
" 154"	97MOB0132	epidote		0.00	0.01	7.96	0.08	26.61	37.02	22.32	0.16	0.08	0.18	0.02	0.12	94.56
" 155"	97MOB0132	epidote		0.00	0.00	8.90	0.06	25.96	37.04	22.09	0.01	0.02	0.17	0.04	0.03	94.32
" 3-159"	97MOB0138	Mg, Ca almandine	crustal	0.00	0.01	25.70	5.69	21.40	37.80	7.67	0.24	0.08	0.44	0.00	0.04	99.07
" 160"	**97MOB0138**	**Ca almandine-pyrope**	**mantle?**	0.00	0.01	21.46	9.44	21.86	38.37	6.44	0.21	0.01	0.52	0.00	0.00	98.33
" 161"	97MOB0138	Mg, Ca almandine	crustal	0.00	0.03	26.56	5.97	21.39	37.57	6.71	0.30	0.00	0.62	0.00	0.04	99.19
" 162"	97MOB0138	Mg, Ca almandine	crustal	0.00	0.00	25.66	2.92	21.38	37.30	10.56	0.12	0.00	1.06	0.00	0.06	99.06
" 163"	97MOB0138	Mn almandine-grossular	crustal	0.00	0.01	23.54	8.93	21.60	38.05	5.69	0.15	0.05	0.44	0.06	0.00	98.51
" 164"	**97MOB0138**	**Ca almandine-pyrope**	**mantle?**	0.00	0.03	21.97	9.56	21.47	38.20	6.22	0.24	0.00	0.50	0.05	0.00	98.24
" 165"	**97MOB0138**	**Cr-diopside**		0.41	0.00	3.61	16.74	1.23	52.89	21.94	0.08	0.54	0.12	0.15	0.06	97.78
" 166"	97MOB0138	epidote		0.00	0.01	8.48	0.03	26.34	37.15	22.21	0.11	0.02	0.03	0.04	0.00	94.41
" 3-171"	97MOB0161	almandine-pyrope	crustal	0.00	0.02	26.55	10.24	22.01	38.77	1.50	0.06	0.04	0.55	0.00	0.04	99.78
" 172"	97MOB0161	almandine-pyrope	crustal	0.00	0.01	24.25	7.89	21.80	38.06	6.21	0.21	0.00	0.55	0.00	0.09	99.09
" 174"	97MOB0161	Mn, Mg, Ca almandine	crustal	0.00	0.01	27.89	5.20	21.18	37.27	5.98	0.17	0.00	1.12	0.02	0.07	98.91
" 175"	97MOB0161	Mg almandine grossular	crustal	0.00	0.00	19.46	6.26	21.66	38.33	12.43	0.24	0.02	0.39	0.09	0.04	98.91
" 176"	**97MOB0161**	**Ca pyrope-almandine**	**mantle?**	0.00	0.02	18.93	11.42	22.17	38.97	6.56	0.14	0.00	0.41	0.05	0.04	98.70
" 177"	97MOB0161	almandine-pyrope	crustal	0.00	0.00	25.16	7.56	21.78	37.73	5.63	0.20	0.00	0.55	0.00	0.00	98.60
" 178"	97MOB0161	Mg, Ca almandine	crustal	0.00	0.01	21.80	6.99	21.75	38.23	9.30	0.19	0.01	0.41	0.01	0.00	98.69
" 179"	**97MOB0161**	**Ca pyrope-almandine**	**mantle?**	0.00	0.02	18.34	10.54	22.36	38.84	7.67	0.10	0.06	0.37	0.02	0.07	98.39
" 180"	97MOB0161	Mg, Ca almandine	crustal	0.00	0.00	27.45	5.65	21.28	37.32	6.13	0.10	0.01	0.68	0.02	0.04	98.67
" 181"	97MOB0161	Mg, Ca almandine	crustal	0.00	0.02	27.48	5.76	21.21	37.33	6.31	0.09	0.00	0.74	0.01	0.03	98.98
" 182"	97MOB0161	almandine-pyrope	crustal	0.00	0.00	23.88	7.74	21.63	37.99	6.88	0.11	0.01	0.56	0.02	0.04	98.87
" 183"	97MOB0161	almandine-pyrope	crustal	0.00	0.00	23.57	8.42	21.90	38.11	6.09	0.12	0.05	0.52	0.00	0.00	98.79
" 185"	97MOB0161	Mg, Ca almandine	crustal	0.00	0.02	26.77	6.01	21.57	37.90	6.44	0.20	0.01	0.54	0.01	0.02	99.49
" 186"	97MOB0161	Mg, Ca almandine	crustal	0.00	0.01	24.42	6.32	22.96	37.06	6.23	0.17	0.05	0.78	0.00	0.02	98.03
" 187"	97MOB0161	almandine-pyrope	crustal	0.00	0.01	23.05	8.89	21.63	38.58	6.42	0.16	0.03	0.44	0.00	0.06	99.26
" 188"	**97MOB0161**	**Ca almandine-pyrope**	**mantle?**	0.00	0.02	20.96	10.42	21.85	38.82	5.97	0.20	0.04	0.46	0.05	0.08	98.86
" 189"	97MOB0161	Mg, Ca almandine	crustal	0.00	0.00	24.86	6.50	21.26	37.81	7.40	0.18	0.02	0.79	0.04	0.03	98.89
" 190"	**97MOB0161**	**Ca almandine-pyrope**	**mantle?**	0.00	0.01	21.54	10.08	22.18	38.88	6.15	0.18	0.05	0.47	0.01	0.02	99.55
" 191"	97MOB0161	almandine-pyrope	crustal	0.00	0.00	22.66	7.66	21.71	38.08	7.88	0.12	0.00	0.55	0.02	0.02	98.70
" 192"	97MOB0161	Mg, Ca almandine	crustal	0.00	0.01	25.11	7.08	21.68	37.84	6.65	0.19	0.03	0.54	0.01	0.04	99.17
" 193"	97MOB0161	Ca, Mg almandine	crustal	0.00	0.00	25.13	5.63	21.04	37.77	8.90	0.18	0.04	0.39	0.02	0.05	99.16

Appendix E.2
Mineral chemistry for all picked grains
SILICATES

Grain	Sample ID	Mineral	Comments	Na2O	K2O	FeO	MgO	Al2O3	SiO2	CaO	TiO2	Cr2O3	MnO	NiO	V2O3	TOTAL
" 194"	97MOB0161	Mn almandine-grossular	crustal	0.00	0.00	25.03	0.69	20.45	36.63	12.89	0.05	0.00	2.23	0.00	0.03	98.00
" 195"	**97MOB0161**	**Ca pyrope-almandine**	**mantle?**	0.00	0.01	18.63	12.47	22.45	39.14	5.40	0.12	0.06	0.48	0.03	0.05	98.84
" 196"	97MOB0161	almandine-pyrope	crustal	0.00	0.02	24.09	8.49	21.59	38.11	5.58	0.15	0.00	0.62	0.02	0.00	98.68
" 197"	97MOB0161	almandine-pyrope	crustal	0.02	0.01	23.32	8.88	21.52	38.20	6.31	0.25	0.07	0.44	0.02	0.04	99.07
" 198"	97MOB0161	almandine-pyrope	crustal	0.09	0.02	22.42	9.31	21.41	38.69	6.65	0.17	0.03	0.51	0.01	0.03	99.35
" 199"	97MOB0161	Mg, Ca almandine	crustal	0.05	0.00	26.30	5.97	20.91	37.26	6.69	0.12	0.00	0.73	0.00	0.05	98.08
" 200"	97MOB0161	Mg grossular almandine	crustal	0.24	0.01	16.22	9.05	2.38	48.99	19.98	0.27	0.08	0.24	0.02	0.12	97.59
" 201"	**97MOB0161**	**Cr-diopside**		0.50	0.00	3.53	16.60	1.15	53.44	21.93	0.11	0.93	0.14	0.05	0.02	98.41
" 202"	**97MOB0161**	**Cr-diopside**		0.75	0.01	3.22	16.30	2.11	53.02	21.30	0.24	0.87	0.19	0.15	0.00	98.18
" 203"	**97MOB0161**	**olivine**		0.00	0.02	10.46	48.52	0.02	40.33	0.00	0.01	0.00	0.23	0.34	0.03	99.97
" 3-205"	97MOB0166	almandine-pyrope	crustal	0.00	0.01	23.94	7.66	21.49	37.74	6.92	0.14	0.01	0.65	0.02	0.04	98.63
" 206"	97MOB0166	Mn almandine-grossular	crustal	0.00	0.01	22.49	1.12	20.58	37.18	13.81	0.08	0.05	2.96	0.04	0.03	98.36
" 207"	**97MOB0166**	**Cr-diopside**		0.58	0.01	3.61	16.07	2.14	53.04	21.63	0.18	0.88	0.18	0.11	0.00	98.42
" 208"	97MOB0166	epidote		0.00	0.01	9.60	0.04	25.45	37.48	22.41	0.01	0.02	0.13	0.02	0.09	95.28
" 3-212"	98MOB0008	almandine-pyrope	crustal	0.00	0.02	23.79	8.45	21.62	37.79	5.87	0.22	0.01	0.67	0.00	0.06	98.51
" 213"	98MOB0008	Mn almandine-grossular	crustal	0.00	0.01	19.59	4.97	21.43	37.57	12.23	0.20	0.00	2.32	0.00	0.01	98.33
" 214"	98MOB0008	Mg, Ca almandine	crustal	0.00	0.00	25.58	6.37	21.42	37.29	6.81	0.26	0.06	0.59	0.00	0.04	98.43
" 215"	**98MOB0008**	**Cr-diopside**		0.61	0.01	4.05	16.67	1.47	53.35	20.86	0.06	0.72	0.15	0.08	0.14	98.17
" 216"	**98MOB0008**	**olivine**		0.00	0.00	8.92	50.48	0.02	39.98	0.08	0.01	0.04	0.15	0.40	0.03	100.11
" 217"	**98MOB0008**	**olivine**		0.00	0.00	8.38	50.31	0.05	40.05	0.06	0.02	0.10	0.08	0.34	0.08	99.47
" 3-220"	98MOB0011	Ca, Mg almandine	crustal	0.03	0.00	23.63	6.85	21.43	38.02	8.25	0.14	0.01	0.56	0.00	0.00	98.93
" 221"	98MOB0011	Mg, Ca almandine	crustal	0.00	0.00	26.18	6.86	21.19	37.60	5.99	0.12	0.03	0.74	0.07	0.00	98.77
" 222"	**98MOB0011**	**Ca almandine-pyrope**	**mantle?**	0.00	0.00	19.79	10.68	22.10	39.01	6.98	0.22	0.00	0.57	0.00	0.02	99.36
" 223"	98MOB0011	almandine-pyrope	crustal	0.00	0.01	23.34	8.79	21.66	38.41	5.89	0.14	0.03	0.69	0.00	0.02	98.98
" 224"	98MOB0011	almandine-pyrope	crustal	0.00	0.01	25.18	8.37	21.83	37.93	4.66	0.17	0.00	0.48	0.04	0.02	98.69
" 225"	**98MOB0011**	**Ca almandine-pyrope**	**mantle?**	0.00	0.00	21.28	9.94	22.02	38.35	6.28	0.27	0.06	0.37	0.00	0.05	98.63
" 226"	98MOB0011	almandine-pyrope	crustal	0.00	0.01	22.51	9.55	21.68	38.18	5.57	0.34	0.02	0.62	0.03	0.00	98.51
" 227"	98MOB0011	Mg, Ca almandine	crustal	0.00	0.00	23.88	7.26	21.45	38.07	7.57	0.21	0.05	0.35	0.04	0.02	98.91
" 228"	98MOB0011	almandine-pyrope	crustal	0.00	0.03	24.10	8.32	21.89	38.15	5.89	0.23	0.09	0.62	0.02	0.05	99.38
" 229"	**98MOB0011**	**olivine**		0.00	0.00	8.91	49.61	0.08	39.86	0.08	0.03	0.04	0.07	0.39	0.00	99.07
" 230"	98MOB0011	epidote		0.00	0.01	8.67	0.05	26.28	37.19	22.41	0.06	0.03	0.11	0.03	0.00	94.84
" 231"	98MOB0011	epidote		0.04	0.01	10.18	0.06	24.72	36.95	22.00	0.12	0.00	0.15	0.05	0.10	94.37
" 232"	**98MOB0011**	**olivine**		0.00	0.00	9.15	49.97	0.04	39.72	0.05	0.04	0.05	0.08	0.36	0.01	99.47
" 3-234"	98MOB0024	almandine-pyrope	crustal	0.00	0.02	23.77	8.60	21.56	37.76	5.56	0.19	0.00	0.61	0.03	0.00	98.10
" 235"	98MOB0024	Mg, Ca almandine	crustal	0.00	0.00	27.72	5.77	21.07	37.48	6.10	0.26	0.06	0.69	0.00	0.00	99.15
" 236"	**98MOB0024**	**Cr-diopside**		0.54	0.00	4.68	15.75	1.60	52.58	21.37	0.15	0.82	0.22	0.02	0.04	97.79
" 237"	**98MOB0024**	**Cr-diopside**		0.69	0.02	4.79	15.40	1.91	52.82	21.38	0.06	0.68	0.12	0.07	0.08	98.01
" 3-242"	98MOB0061	Ca, Mg almandine	crustal	0.00	0.02	23.00	7.01	21.62	38.03	8.51	0.18	0.00	0.53	0.00	0.05	98.94
" 243"	98MOB0061	almandine-pyrope	crustal	0.01	0.02	23.86	7.95	21.59	38.10	6.81	0.19	0.00	0.53	0.00	0.08	99.15
" 244"	**98MOB0061**	**Ca almandine-pyrope**	**mantle?**	0.00	0.00	21.19	8.81	22.06	38.49	7.25	0.19	0.02	0.45	0.02	0.05	98.52
" 245"	98MOB0061	Ca, Mg almandine	crustal	0.00	0.00	33.13	1.58	20.77	36.18	6.11	0.09	0.02	0.38	0.01	0.04	98.31
" 246"	98MOB0061	Mn almandine-grossular	crustal	0.00	0.00	24.70	0.78	20.95	36.64	9.79	0.08	0.02	5.76	0.00	0.00	98.72
" 247"	98MOB0061	almandine-pyrope	crustal	0.00	0.01	24.42	7.88	21.39	37.93	6.20	0.15	0.00	0.66	0.01	0.04	98.69

Appendix E.2
Mineral chemistry for all picked grains
SILICATES

Grain	Sample ID	Mineral	Comments	Na2O	K2O	FeO	MgO	Al2O3	SiO2	CaO	TiO2	Cr2O3	MnO	NiO	V2O3	TOTAL
" 248"	98MOB0061	Mg, Ca almandine	crustal	0.00	0.02	27.08	6.13	21.11	37.49	6.05	0.15	0.01	0.74	0.07	0.05	98.89
" 249"	98MOB0061	Mg, Ca almandine	crustal	0.00	0.00	27.72	5.54	21.38	37.55	6.31	0.15	0.01	0.53	0.00	0.02	99.24
" 250"	98MOB0061	Mn almandine-grossular	crustal	0.00	0.00	21.47	1.92	21.06	37.16	11.90	0.18	0.00	4.69	0.00	0.08	98.46
" 251"	**98MOB0061**	**almandine-pyrope-grossular**	**mantle?**	0.00	0.00	18.17	8.61	21.86	38.42	10.58	0.18	0.09	0.31	0.04	0.06	98.31
" 252"	98MOB0061	almandine-pyrope	crustal	0.00	0.01	22.12	8.34	21.73	38.07	7.35	0.18	0.07	0.40	0.03	0.09	98.38
" 253"	98MOB0061	Mg, Ca almandine	crustal	0.01	0.01	25.10	6.23	21.34	37.57	7.16	0.11	0.01	0.75	0.00	0.00	98.28
" 254"	98MOB0061	almandine-pyrope	crustal	0.00	0.00	23.49	7.80	21.56	38.08	6.66	0.30	0.06	0.60	0.00	0.01	98.57
" 255"	98MOB0061	diopside		0.49	0.00	3.20	16.29	0.87	53.63	23.07	0.03	0.19	0.08	0.08	0.00	97.92
" 256"	**98MOB0061**	**Cr-diopside**		0.48	0.00	2.84	16.47	0.90	54.07	23.06	0.06	0.52	0.10	0.00	0.05	98.57
" 257"	98MOB0061	epidote		0.00	0.00	8.82	0.07	26.04	36.92	22.24	0.01	0.02	0.14	0.00	0.00	94.25
" 258"	**98MOB0061**	**olivine**		0.00	0.01	11.14	47.79	0.07	39.57	0.07	0.04	0.06	0.16	0.36	0.02	99.28
" 259"	**98MOB0061**	**olivine**		0.00	0.00	8.84	50.11	0.04	40.00	0.08	0.01	0.04	0.12	0.43	0.03	99.70
" 260"	98MOB0061	epidote		0.00	0.00	10.35	0.04	25.06	37.14	22.32	0.02	0.01	0.14	0.02	0.02	95.11
" 261"	98MOB0061	epidote		0.00	0.00	8.14	0.05	27.19	37.43	22.07	0.03	0.00	0.15	0.00	0.08	95.13
" 3-267"	**98MOB0072**	**Cr-pyrope**	**G9**	0.00	0.01	7.42	20.01	19.12	40.68	5.56	0.78	4.64	0.39	0.03	0.06	98.68
" 268"	98MOB0072	Ca, Mg almandine	crustal	0.00	0.00	22.28	6.58	21.74	37.78	9.16	0.17	0.07	0.47	0.00	0.02	98.27
" 269"	**98MOB0072**	**Cr-diopside**		0.50	0.00	3.86	16.23	1.21	53.26	21.65	0.14	0.75	0.16	0.03	0.05	97.85
" 270"	98MOB0072	diopside		0.59	0.01	3.43	15.84	0.96	53.70	23.01	0.04	0.27	0.15	0.00	0.05	98.06
" 3-273"	98MOB0074	almandine-pyrope	crustal	0.00	0.02	23.05	8.73	21.58	38.38	6.24	0.23	0.02	0.51	0.03	0.05	98.82
" 274"	98MOB0074	Mg, Ca almandine	crustal	0.00	0.00	25.10	7.46	21.29	37.86	6.00	0.29	0.04	0.66	0.04	0.03	98.75
" 275"	98MOB0074	Mn almandine	crustal	0.00	0.01	32.34	0.87	20.67	36.11	5.61	0.13	0.01	3.19	0.09	0.02	99.03
" 276"	98MOB0074	Mg, Ca almandine	crustal	0.00	0.00	26.52	6.02	21.19	37.35	6.25	0.26	0.04	0.49	0.00	0.01	98.13
" 277"	98MOB0074	Ca, Mg almandine	crustal	0.04	0.01	25.02	5.46	21.18	37.33	8.54	0.13	0.00	0.47	0.00	0.07	98.25
" 278"	98MOB0074	Mg, Ca almandine	crustal	0.00	0.00	21.77	7.03	21.90	38.64	9.04	0.25	0.17	0.33	0.00	0.00	99.14
" 279"	98MOB0074	Mg almandine grossular	crustal	0.00	0.00	20.76	6.69	21.81	37.81	10.77	0.25	0.00	0.33	0.00	0.03	98.46
" 280"	98MOB0074	Mg, Ca almandine	crustal	0.00	0.02	28.02	5.29	20.79	37.34	6.07	0.27	0.03	0.80	0.04	0.08	98.73
" 281"	**98MOB0074**	**Ca almandine-pyrope**	**mantle?**	0.00	0.00	21.57	9.40	21.82	38.72	6.75	0.15	0.04	0.54	0.06	0.00	99.05
" 282"	98MOB0074	spessartine-almandine	crustal	0.00	0.00	19.38	1.04	20.04	35.63	0.37	0.11	0.08	21.41	0.06	0.00	98.11
" 283"	98MOB0074	almandine-pyrope	crustal	0.00	0.02	26.15	7.76	21.23	37.91	5.08	0.08	0.09	0.44	0.00	0.04	98.78
" 284"	**98MOB0074**	**almandine-pyrope-grossular**	**mantle?**	0.00	0.01	16.37	9.09	22.24	38.96	11.63	0.10	0.04	0.31	0.00	0.03	98.78
" 285"	98MOB0074	Mg, Ca almandine	crustal	0.00	0.01	27.67	4.87	21.04	37.61	6.95	0.24	0.01	0.51	0.00	0.02	98.93
" 286"	98MOB0074	spessartine-almandine	crustal	0.00	0.00	19.95	0.12	20.24	35.17	0.17	0.08	0.00	22.49	0.03	0.02	98.28
" 287"	98MOB0074	spessartine-almandine	crustal	0.01	0.01	11.21	0.02	20.24	35.11	0.42	0.11	0.00	31.22	0.00	0.02	98.39
" 288"	**98MOB0074**	**Cr-diopside**		0.58	0.00	3.61	15.86	2.30	53.03	21.70	0.07	1.28	0.13	0.10	0.00	98.67
" 289"	98MOB0074	epidote		0.00	0.03	9.58	0.03	25.19	37.00	22.04	0.19	0.00	0.37	0.03	0.02	94.48
" 3-291"	98MOB0075	Mn almandine-grossular	crustal	0.00	0.01	23.83	1.87	21.03	37.41	12.75	0.10	0.00	1.50	0.00	0.04	98.55
" 292"	**98MOB0075**	**Cr-diopside**		0.50	0.01	3.52	16.66	1.08	53.84	22.05	0.10	0.77	0.13	0.00	0.01	98.66
" 293"	98MOB0075	diopside		0.84	0.00	4.22	15.81	1.88	52.76	21.16	0.06	0.40	0.12	0.02	0.01	97.27
" 294"	**98MOB0075**	**Cr-diopside**		0.49	0.01	4.20	16.21	1.15	52.95	21.43	1.24	0.64	0.13	0.01	0.00	98.47
" 3-299"	98MOB0077	Mg, Ca almandine	crustal	0.00	0.01	24.49	6.72	21.35	38.06	7.56	0.19	0.00	0.51	0.04	0.06	98.97
" 300"	98MOB0077	Mg, Ca almandine	crustal	0.00	0.00	23.08	7.42	21.35	37.59	7.43	0.26	0.07	0.56	0.00	0.00	97.75
" 301"	**98MOB0077**	**Ca almandine-pyrope**	**mantle?**	0.01	0.00	21.45	10.47	21.76	38.64	5.99	0.16	0.15	0.51	0.01	0.05	99.20
" 302"	98MOB0077	almandine-pyrope	crustal	0.00	0.00	24.18	8.15	21.60	38.28	6.12	0.27	0.05	0.60	0.03	0.07	99.35

Appendix E.2
Mineral chemistry for all picked grains
SILICATES

Grain	Sample ID	Mineral	Comments	Na2O	K2O	FeO	MgO	Al2O3	SiO2	CaO	TiO2	Cr2O3	MnO	NiO	V2O3	TOTAL
" 303"	98MOB0077	spessartine-almandine	crustal	0.00	0.00	15.94	0.55	20.18	35.64	1.86	0.05	0.00	24.11	0.00	0.03	98.37
" 304"	98MOB0077	Ca, Mg almandine	crustal	0.00	0.00	27.17	4.67	21.12	37.43	7.27	0.17	0.01	0.73	0.02	0.05	98.64
" 305"	98MOB0077	almandine-pyrope	crustal	0.00	0.00	22.91	8.43	21.21	38.02	7.21	0.23	0.04	0.48	0.00	0.04	98.57
" 306"	**98MOB0077**	**Ca almandine-pyrope**	**mantle?**	0.00	0.00	20.46	10.55	21.88	38.68	6.16	0.17	0.04	0.36	0.02	0.03	98.36
" 307"	98MOB0077	almandine-pyrope	crustal	0.00	0.00	24.54	7.90	21.68	37.94	5.46	0.35	0.05	0.75	0.00	0.02	98.68
" 308"	98MOB0099	Mn almandine-grossular	crustal	0.00	0.01	21.19	0.88	20.51	36.82	10.88	0.22	0.03	7.97	0.00	0.07	98.56
" 309"	98MOB0099	staurolite		0.00	0.00	14.54	1.61	52.72	26.32	0.01	0.60	0.10	0.07	0.03	0.02	96.02
" 310"	98MOB0099	Mn almandine-grossular	crustal	0.00	0.00	19.45	0.39	20.46	36.93	14.35	0.32	0.05	6.50	0.01	0.08	98.54
" 311"	98MOB0099	Ca, Mg almandine	crustal	0.00	0.01	33.52	1.35	20.82	36.42	6.38	0.11	0.05	0.09	0.00	0.01	98.75
" 312"	98MOB0099	Mn almandine-grossular	crustal	0.00	0.01	19.26	0.54	20.09	36.97	14.01	0.41	0.02	7.09	0.04	0.02	98.45
" 3-315"	98MOB0114	epidote		0.00	0.01	8.94	0.02	25.73	37.10	22.35	0.12	0.04	0.11	0.01	0.00	94.41
" 316"	**98MOB0128**	**Ca almandine-pyrope**	**mantle?**	0.00	0.00	21.47	10.06	21.51	38.42	5.80	0.20	0.13	0.63	0.03	0.00	98.27
" 317"	98MOB0128	Mg, Ca almandine	crustal	0.01	0.01	28.40	4.89	21.01	37.06	6.56	0.10	0.01	0.72	0.00	0.00	98.76
" 318"	98MOB0128	Mn almandine-grossular	crustal	0.01	0.00	19.22	1.25	20.98	37.01	15.50	0.28	0.00	4.03	0.01	0.12	98.42
" 319"	98MOB0128	almandine-pyrope	crustal	0.00	0.00	22.50	8.41	21.83	37.87	6.89	0.16	0.02	0.51	0.05	0.06	98.30
" 320"	98MOB0128	Mg, Ca almandine	crustal	0.00	0.01	25.48	7.12	21.35	37.62	6.59	0.10	0.02	0.64	0.00	0.00	98.93
" 321"	**98MOB0129**	**Cr-diopside**		0.60	0.02	3.65	15.82	1.91	52.72	21.46	0.17	1.01	0.15	0.05	0.00	97.54
" 3-324"	98MOB0133	diopside		0.33	0.00	5.18	16.89	1.90	52.75	20.73	0.20	0.10	0.21	0.04	0.05	98.37
" 325"	**98MOB0148**	**Cr-diopside**		0.36	0.00	3.99	17.01	0.64	51.73	20.97	0.06	0.57	0.14	0.11	0.00	95.58
" 327"	98MOB0150	almandine-pyrope	crustal	0.00	0.00	22.98	8.29	21.70	38.14	6.53	0.22	0.04	0.49	0.00	0.08	98.48
" 328"	98MOB0150	Mg almandine grossular	crustal	0.00	0.00	20.39	5.70	21.55	38.23	12.55	0.16	0.06	0.27	0.04	0.01	98.97
" 329"	**98MOB0150**	**Cr-diopside**		0.35	0.00	4.57	17.81	1.20	53.25	20.07	0.22	0.49	0.10	0.08	0.01	98.13
" 3-331"	**98MOB0155**	**Cr-diopside**		0.59	0.00	4.25	16.09	1.37	53.32	21.33	0.17	0.91	0.13	0.07	0.02	98.26
" 332"	**98MOB0157**	**olivine**		0.00	0.00	13.71	46.08	0.00	39.20	0.01	0.00	0.00	0.22	0.54	0.02	99.79
" 3-334"	**98MOB0167**	**Cr-diopside**		0.52	0.01	3.86	16.40	1.17	53.00	21.51	0.13	0.77	0.11	0.04	0.02	97.52
" 335"	98MOB0167	diopside		0.74	0.07	3.62	16.36	1.49	52.92	21.52	0.09	0.45	0.19	0.07	0.06	97.59
" 3-338"	98MOB0178	Ca, Mg almandine	crustal	0.00	0.01	24.81	5.95	21.09	37.44	8.16	0.19	0.00	0.62	0.06	0.10	98.42
" 339"	98MOB0178	epidote		0.00	0.00	8.16	0.03	26.80	37.41	22.52	0.04	0.02	0.14	0.03	0.07	95.21
" 340"	98MOB0178	epidote		0.00	0.00	7.73	0.03	26.73	37.39	22.29	0.15	0.02	0.05	0.03	0.00	94.41
" 3-342"	98MOB0180	epidote		0.00	0.00	7.53	0.05	27.29	37.27	22.72	0.02	0.05	0.09	0.00	0.03	95.05
" 343"	98MOB0180	epidote		0.00	0.00	7.38	0.04	27.23	37.55	22.42	0.02	0.02	0.12	0.00	0.02	94.80
" 344"	98MOB0180	epidote		0.00	0.00	7.56	0.07	27.15	37.46	22.29	0.06	0.00	0.16	0.02	0.06	94.82
" 345"	**98MOB0188**	**Ca almandine-pyrope**	**mantle?**	0.00	0.04	21.52	8.99	21.81	38.86	7.51	0.15	0.00	0.41	0.03	0.03	99.34
" 3-347"	98MOB0190	Mg almandine grossular	crustal	0.00	0.00	19.49	6.34	21.94	38.36	12.55	0.20	0.06	0.27	0.00	0.00	99.21
" 348"	**98MOB0190**	**Cr-diopside**		0.60	0.02	3.58	15.38	3.47	50.79	20.55	0.20	0.98	0.16	0.00	0.04	95.78
" 3-351"	98MOB0193	Mg, Ca almandine	crustal	0.00	0.01	24.41	7.01	21.34	38.15	7.52	0.18	0.00	0.31	0.00	0.12	99.05
" 352"	**98MOB0193**	**Cr-diopside**		0.83	0.00	3.60	15.86	2.16	53.32	21.16	0.22	1.33	0.13	0.10	0.00	98.71
" 353"	98MOB0198	Mg, Ca almandine	crustal	0.00	0.01	29.72	4.57	20.97	37.07	5.54	0.02	0.07	0.81	0.03	0.00	98.80
" 354"	98MOB0198	Ca, Mg almandine	crustal	0.00	0.00	26.28	5.61	21.19	37.59	7.44	0.17	0.00	0.48	0.05	0.07	98.88
" 355"	**98MOB0203**	**Cr-diopside**		0.48	0.01	4.39	18.96	2.11	52.90	18.11	0.38	0.92	0.12	0.07	0.05	98.50
MacQuoid Lake samples (0.25-0.5mm):																
" 98HJB-2"	98HJB0003	almandine	crustal	0.0	0.0	27.3	1.1	21.0	36.8	11.4	0.1	0.1	0.4	0.2	0.0	98.26

Appendix E.2
Mineral chemistry for all picked grains
SILICATES

Grain	Sample ID	Mineral	Comments	Na2O	K2O	FeO	MgO	Al2O3	SiO2	CaO	TiO2	Cr2O3	MnO	NiO	V2O3	TOTAL
" 3"	98HJB0003	spessartine		0.0	0.0	18.9	0.5	20.5	35.8	0.6	0.1	0.0	23.3	0.0	0.3	100.02
" 4"	98HJB0003	almandine	crustal	0.0	0.0	23.5	7.9	22.0	38.0	6.5	0.1	0.2	0.6	0.0	0.0	98.94
" 98HJB-6"	98HJB0003	epidote		0.0	0.0	10.2	0.0	24.2	37.6	23.4	0.0	0.0	0.2	0.0	0.0	95.72
" 98HJB-7"	98HJB0004	almandine	crustal	0.0	0.0	23.7	0.7	21.1	37.1	13.4	0.1	0.0	3.4	0.0	0.1	99.70
" 98HJB-9"	98HJB0004	epidote		0.0	0.0	11.8	0.0	24.3	37.5	23.2	0.1	0.0	0.0	0.1	0.1	97.26
" 10"	**98HJB0020**	**Cr-diopside**		0.26	0.00	2.85	17.33	0.84	54.13	23.20	0.16	0.86	0.05	0.03	0.00	99.71
" 11"	**98HJB0021**	**Cr-diopside**		0.25	0.00	3.75	17.65	0.97	53.86	22.42	0.27	0.74	0.15	0.04	0.05	100.15
" 12"	**98HJB0021**	**Cr-diopside**		0.15	0.00	2.98	17.44	0.68	53.89	23.22	0.12	0.60	0.13	0.00	0.08	99.29
" 14"	**98HJB0021**	**Cr-diopside**		0.23	0.00	3.81	17.15	1.29	53.62	22.11	0.22	0.82	0.11	0.00	0.00	99.37
" 15"	**98HJB0025**	**Cr-diopside**		0.37	0.00	3.82	18.25	1.59	53.83	20.90	0.10	0.92	0.10	0.10	0.08	100.06
"98HJB-18"	98HJB0045	diopside		0.51	0.00	3.82	16.70	1.25	53.63	23.26	0.20	0.33	0.08	0.00	0.03	99.81
" 19"	98HJB0046	diopside		0.22	0.00	4.05	17.72	0.64	54.59	22.31	0.14	0.05	0.17	0.05	0.04	99.97
" 20"	**98HJB0047**	**Cr-diopside**		0.20	0.00	3.29	16.99	0.83	53.18	22.94	0.23	0.68	0.05	0.04	0.06	98.50
" 21"	98HJB0050	diopside		0.17	0.00	2.95	18.82	0.34	54.73	22.31	0.17	0.17	0.19	0.02	0.05	99.92
" 22"	98HJB0051	diopside		0.22	0.01	3.27	18.12	0.60	55.12	22.14	0.10	0.08	0.12	0.03	0.00	99.81
" 23"	**98HJB0052**	**Cr-diopside**		0.17	0.00	2.61	18.45	0.40	54.88	22.18	0.07	0.52	0.09	0.05	0.00	99.43
" 24"	**98HJB0052**	**Cr-diopside**		0.15	0.00	2.88	18.70	0.49	54.53	21.97	0.08	0.58	0.15	0.06	0.00	99.58
" 25"	98HJB0057	diopside		0.15	0.00	3.51	17.75	0.79	54.20	22.69	0.20	0.35	0.20	0.08	0.04	99.96
" 26"	98HJB0057	diopside		0.25	0.02	4.73	17.30	0.85	54.16	22.16	0.11	0.09	0.12	0.03	0.02	99.83
" 27"	**98HJB0062**	**Cr-diopside**		0.30	0.00	4.76	17.42	2.14	52.82	20.67	0.13	1.04	0.20	0.09	0.03	99.59
" 28"	**98HJB0062**	**Cr-diopside**		0.51	0.03	2.81	17.74	0.79	54.50	22.31	0.13	0.81	0.11	0.04	0.00	99.77
" 29"	98HJB0062	epidote		0.0	0.0	9.9	0.1	24.4	37.7	23.5	0.1	0.0	0.1	0.0	0.0	95.74
" 30"	**98HJB0063**	**Cr-diopside**		0.24	0.01	3.55	17.50	0.92	54.25	22.89	0.25	0.66	0.09	0.07	0.03	100.47
" 31"	**98HJB0063**	**Cr-diopside**		0.28	0.03	3.50	17.90	1.84	53.37	21.45	0.09	0.77	0.02	0.03	0.07	99.36
" 32"	98HJB0063	diopside		0.22	0.00	3.62	17.45	0.66	53.95	22.68	0.18	0.38	0.10	0.07	0.04	99.36
" 33"	98HJB0064	diopside		0.87	0.00	3.86	16.51	1.56	54.26	21.52	0.05	0.27	0.21	0.03	0.00	99.14
" 34"	98HJB0065	diopside		0.26	0.00	3.06	17.02	0.81	53.78	23.73	0.17	0.46	0.11	0.00	0.00	99.40
" 35"	**98HJB0073**	**Cr-diopside**		0.15	0.00	4.28	18.19	1.64	54.06	20.93	0.14	1.24	0.16	0.09	0.00	100.86
" 36"	**98HJB0075**	**Cr-diopside**		0.24	0.00	2.77	16.91	0.65	54.19	24.07	0.26	0.63	0.10	0.00	0.01	99.82
" 37"	98HJB0075	diopside		0.43	0.00	3.50	17.45	0.76	54.23	22.28	0.14	0.21	0.09	0.01	0.00	99.11

Appendix E.2
Mineral chemistry for all picked grains
OXIDES

Grain	Sample ID	Mineral	MgO	Al2O3	SiO2	SO3	CaO	TiO2	V2O3	Cr2O3	MnO	FeO	CoO	NiO	ZnO	As2O3	Nb2O5	TOTAL
Kimberlite sample S-1990:																		
" 1-1"	S-1990 (1-2mm)	Cr-spinel	12.13	11.00	0.14	0.00	0.00	5.60	0.35	42.35	0.22	27.22	0.05	0.16	0.01	0.12	0.00	99.34
" 2"	S-1990 (1-2mm)	spinel	17.02	25.41	1.38	0.13	0.91	9.34	0.05	0.00	0.55	41.21	0.06	0.11	0.05	0.19	0.00	96.41
" 2-1"	S-1990 (0.5-1mm)	Cr-spinel	12.49	11.80	0.03	0.00	0.01	5.81	0.27	41.01	0.26	26.58	0.05	0.19	0.14	0.21	0.06	98.92
" 2"	S-1990 (0.5-1mm)	Cr-spinel	12.55	9.30	0.12	0.00	0.00	5.66	0.34	45.81	0.26	24.96	0.11	0.31	0.00	0.32	0.08	99.83
" 3"	S-1990 (0.5-1mm)	spinel	12.42	8.07	0.17	0.06	0.12	13.29	0.24	15.60	0.53	46.38	0.10	0.03	0.09	0.14	0.20	97.43
" 4"	S-1990 (0.5-1mm)	Cr-spinel	12.39	9.70	0.14	0.00	0.00	5.25	0.24	45.56	0.25	25.63	0.06	0.13	0.11	0.11	0.00	99.55
" 5"	S-1990 (0.5-1mm)	spinel	10.63	1.31	12.19	0.14	0.53	24.54	0.13	0.09	1.05	41.81	0.09	0.01	0.08	0.27	0.24	93.12
" 6"	S-1990 (0.5-1mm)	ilmenite	0.96	0.06	0.03	0.00	0.03	49.08	0.31	0.04	0.84	48.95	0.02	0.00	0.00	0.01	0.11	100.44
" 4-1"	S-1990 (0.25-0.5mm)	ilmenite	0.70	0.10	0.02	0.00	0.06	49.70	0.40	0.11	0.63	48.72	0.02	0.05	0.05	0.00	0.16	100.73
" 2"	S-1990 (0.25-0.5mm)	Cr-spinel	13.03	9.12	0.14	0.03	0.00	5.62	0.55	45.40	0.22	25.73	0.05	0.25	0.07	0.11	0.06	100.38
" 3"	S-1990 (0.25-0.5mm)	Cr-spinel	12.61	9.62	0.12	0.00	0.01	6.00	0.42	42.99	0.27	26.71	0.08	0.17	0.09	0.15	0.17	99.42
" 4"	S-1990 (0.25-0.5mm)	Cr-spinel	12.34	9.90	0.15	0.04	0.03	4.28	0.45	46.67	0.20	24.87	0.10	0.23	0.16	0.22	0.00	99.65
" 5"	S-1990 (0.25-0.5mm)	Cr-spinel	12.31	9.39	0.14	0.00	0.02	5.52	0.42	45.01	0.29	26.28	0.06	0.10	0.06	0.25	0.00	99.85
" 6"	S-1990 (0.25-0.5mm)	Cr-spinel	13.32	9.35	0.10	0.00	0.05	6.04	0.27	44.00	0.24	25.70	0.01	0.18	0.00	0.20	0.30	99.77
" 7"	S-1990 (0.25-0.5mm)	Cr-spinel	12.45	11.05	0.14	0.06	0.00	6.16	0.36	41.09	0.19	28.57	0.07	0.19	0.08	0.06	0.00	100.48
" 8"	S-1990 (0.25-0.5mm)	Cr-spinel	12.38	9.94	0.11	0.00	0.00	4.21	0.35	47.04	0.20	24.60	0.05	0.19	0.08	0.23	0.00	99.39
" 9"	S-1990 (0.25-0.5mm)	Cr-spinel	12.83	9.66	0.17	0.00	0.01	5.54	0.38	45.08	0.20	25.34	0.07	0.17	0.10	0.28	0.00	99.83
" 10"	S-1990 (0.25-0.5mm)	Cr-spinel	11.46	9.68	0.12	0.01	0.01	5.73	0.34	42.92	0.24	27.58	0.02	0.20	0.00	0.15	0.03	98.50
" 11"	S-1990 (0.25-0.5mm)	Cr-spinel	12.78	9.35	0.08	0.04	0.03	4.73	0.29	46.47	0.34	24.69	0.07	0.26	0.07	0.13	0.07	99.41
" 12"	S-1990 (0.25-0.5mm)	ilmenite	1.80	0.12	0.05	0.00	0.01	47.34	0.45	0.00	0.34	49.10	0.00	0.06	0.12	0.17	0.04	99.60
" 13"	S-1990 (0.25-0.5mm)	Cr-spinel	12.42	11.08	0.13	0.01	0.03	5.75	0.32	41.66	0.22	26.95	0.01	0.20	0.10	0.26	0.13	99.27
" 14"	S-1990 (0.25-0.5mm)	Cr-spinel	12.40	9.26	0.10	0.00	0.00	5.79	0.29	44.79	0.20	25.71	0.09	0.22	0.00	0.16	0.13	99.13
" 15"	S-1990 (0.25-0.5mm)	Cr-spinel	11.94	9.54	0.10	0.05	0.00	5.77	0.30	43.78	0.37	27.09	0.16	0.20	0.08	0.07	0.01	99.49
" 16"	S-1990 (0.25-0.5mm)	spinel	12.88	7.39	0.14	0.00	0.06	15.81	0.34	15.14	0.55	44.69	0.00	0.02	0.04	0.19	0.13	97.37
" 18"	S-1990 (0.25-0.5mm)	Cr-spinel	12.04	10.09	0.11	0.06	0.03	5.00	0.31	45.03	0.38	26.39	0.06	0.21	0.00	0.20	0.19	100.09
" 19"	S-1990 (0.25-0.5mm)	Cr-spinel	12.34	10.79	0.08	0.02	0.03	5.73	0.26	42.75	0.33	27.01	0.04	0.18	0.11	0.20	0.00	99.88
" 20"	S-1990 (0.25-0.5mm)	Cr-spinel	12.59	11.95	0.13	0.10	0.03	5.46	0.42	41.94	0.25	26.88	0.08	0.14	0.13	0.17	0.07	100.35
" 21"	S-1990 (0.25-0.5mm)	Cr-spinel	11.56	10.53	0.13	0.03	0.05	5.23	0.23	42.58	0.26	27.76	0.04	0.17	0.15	0.16	0.00	98.88
" 22"	S-1990 (0.25-0.5mm)	Cr-spinel	11.60	9.67	0.13	0.00	0.00	4.31	0.30	46.29	0.26	26.37	0.08	0.18	0.09	0.32	0.00	99.60
" 23"	S-1990 (0.25-0.5mm)	Mg-ilmenite	13.32	0.70	0.70	0.00	0.03	51.90	0.40	4.26	0.33	29.36	0.03	0.15	0.02	0.26	0.14	101.60
" 25"	S-1990 (0.25-0.5mm)	Cr-spinel	12.72	9.99	0.16	0.08	0.01	5.84	0.34	43.31	0.30	26.62	0.03	0.23	0.00	0.17	0.14	99.94
" 26"	S-1990 (0.25-0.5mm)	Cr-spinel	12.21	9.65	0.06	0.02	0.02	5.42	0.36	44.72	0.00	26.08	0.02	0.21	0.00	0.19	0.03	98.98
" 27"	S-1990 (0.25-0.5mm)	Cr-spinel	12.13	11.01	0.06	0.07	0.00	5.49	0.32	42.13	0.25	27.61	0.00	0.12	0.09	0.17	0.10	99.55
" 29"	S-1990 (0.25-0.5mm)	Cr-spinel	12.32	10.97	0.13	0.00	0.00	6.21	0.42	40.76	0.27	28.77	0.00	0.20	0.22	0.28	0.00	100.55
" 30"	S-1990 (0.25-0.5mm)	Cr-spinel	12.94	10.93	0.13	0.00	0.04	6.28	0.34	42.32	0.36	26.85	0.05	0.12	0.05	0.17	0.00	100.59
" 31"	S-1990 (0.25-0.5mm)	Cr-spinel	12.28	9.69	0.13	0.03	0.03	5.86	0.36	43.19	0.23	26.53	0.03	0.24	0.05	0.25	0.00	98.90
" 32"	S-1990 (0.25-0.5mm)	Cr-spinel	12.18	10.54	0.07	0.03	0.04	6.33	0.46	40.61	0.23	28.18	0.00	0.16	0.00	0.15	0.13	99.10
" 33"	S-1990 (0.25-0.5mm)	Cr-spinel	12.61	9.42	0.09	0.00	0.01	6.12	0.23	42.76	0.24	27.19	0.08	0.18	0.14	0.21	0.00	99.28
" 34"	S-1990 (0.25-0.5mm)	Cr-spinel	11.27	10.03	0.11	0.00	0.00	6.08	0.44	41.30	0.35	28.95	0.09	0.18	0.10	0.26	0.00	99.16
" 36"	S-1990 (0.25-0.5mm)	Cr-spinel	12.65	11.44	0.16	0.04	0.00	5.17	0.29	43.06	0.31	25.43	0.03	0.13	0.00	0.21	0.03	98.93
" 37"	S-1990 (0.25-0.5mm)	Cr-spinel	12.00	9.41	0.13	0.10	0.00	5.67	0.43	43.67	0.19	27.07	0.13	0.28	0.13	0.19	0.07	99.46
" 38"	S-1990 (0.25-0.5mm)	Cr-spinel	12.57	9.41	0.12	0.04	0.01	5.43	0.29	45.16	0.21	25.03	0.05	0.15	0.14	0.19	0.00	98.78

Appendix E.2
Mineral chemistry for all picked grains
OXIDES

Grain	Sample ID	Mineral	MgO	Al2O3	SiO2	SO3	CaO	TiO2	V2O3	Cr2O3	MnO	FeO	CoO	NiO	ZnO	As2O3	Nb2O5	TOTAL
" 39"	S-1990 (0.25-0.5mm)	Cr-spinel	12.55	9.77	0.09	0.00	0.02	5.70	0.25	44.08	0.21	26.52	0.08	0.17	0.11	0.16	0.00	99.71
" 40"	S-1990 (0.25-0.5mm)	Cr-spinel	12.37	7.81	0.13	0.05	0.00	6.07	0.36	44.65	0.21	27.09	0.09	0.15	0.12	0.19	0.09	99.38
" 41"	S-1990 (0.25-0.5mm)	Cr-spinel	12.33	9.19	0.12	0.01	0.01	4.86	0.41	46.60	0.14	25.10	0.12	0.27	0.15	0.24	0.00	99.56
" 42"	S-1990 (0.25-0.5mm)	Cr-spinel	12.30	10.56	0.13	0.00	0.01	5.85	0.34	41.64	0.31	26.74	0.00	0.22	0.05	0.15	0.03	98.33
" 43"	S-1990 (0.25-0.5mm)	Cr-spinel	12.61	9.68	0.12	0.03	0.02	4.45	0.37	46.79	0.22	24.67	0.00	0.20	0.09	0.20	0.00	99.44
" 44"	S-1990 (0.25-0.5mm)	ilmenite	0.94	0.03	0.03	0.11	0.05	48.73	0.31	0.00	0.90	48.54	0.10	0.02	0.04	0.08	0.00	99.88
" 45"	S-1990 (0.25-0.5mm)	Cr-spinel	11.51	8.71	0.09	0.00	0.02	8.02	0.29	36.84	0.32	33.30	0.09	0.14	0.06	0.19	0.06	99.63
" 46"	S-1990 (0.25-0.5mm)	Cr-spinel	12.25	9.50	0.08	0.04	0.00	5.53	0.27	44.24	0.19	26.38	0.11	0.18	0.05	0.24	0.10	99.16
" 47"	S-1990 (0.25-0.5mm)	Cr-spinel	11.40	10.44	0.10	0.00	0.02	4.52	0.39	45.99	0.22	25.98	0.08	0.12	0.18	0.28	0.16	99.87
" 48"	S-1990 (0.25-0.5mm)	ilmenite	1.25	0.09	0.09	0.07	0.00	47.63	0.43	0.03	0.74	49.02	0.02	0.00	0.00	0.16	0.15	99.69
" 50"	S-1990 (0.25-0.5mm)	Cr-spinel	11.94	9.92	0.15	0.08	0.02	3.97	0.22	47.28	0.28	25.52	0.02	0.14	0.04	0.21	0.00	99.79
" 51"	S-1990 (0.25-0.5mm)	Cr-spinel	11.57	10.01	0.11	0.00	0.00	6.16	0.43	41.36	0.25	28.74	0.10	0.23	0.09	0.12	0.00	99.18
" 52"	S-1990 (0.25-0.5mm)	Cr-spinel	12.92	11.57	0.11	0.00	0.01	5.43	0.39	42.97	0.24	25.93	0.05	0.19	0.16	0.13	0.13	100.22
" 53"	S-1990 (0.25-0.5mm)	Cr-spinel	11.59	10.13	0.10	0.01	0.00	6.04	0.45	41.08	0.25	29.52	0.00	0.21	0.00	0.06	0.00	99.44
" 54"	S-1990 (0.25-0.5mm)	Cr-spinel	11.93	9.80	0.11	0.07	0.00	5.02	0.32	45.34	0.22	26.87	0.08	0.27	0.00	0.31	0.23	100.58
" 55"	S-1990 (0.25-0.5mm)	Cr-spinel	11.43	9.67	0.00	0.00	0.03	5.99	0.30	42.57	0.39	29.33	0.03	0.29	0.05	0.21	0.04	100.33
" 56"	S-1990 (0.25-0.5mm)	Cr-spinel	12.32	11.34	0.13	0.09	0.00	5.68	0.28	42.37	0.12	26.98	0.07	0.23	0.00	0.26	0.00	99.87
" 57"	S-1990 (0.25-0.5mm)	Cr-spinel	12.60	9.94	0.07	0.10	0.00	5.40	0.38	44.79	0.26	26.01	0.05	0.24	0.07	0.24	0.00	100.15
" 58"	S-1990 (0.25-0.5mm)	Cr-spinel	11.89	9.95	0.12	0.00	0.04	4.42	0.18	46.06	0.24	25.65	0.01	0.13	0.07	0.24	0.00	98.99
" 59"	S-1990 (0.25-0.5mm)	Cr-spinel	11.80	10.30	0.09	0.09	0.02	6.43	0.41	41.04	0.17	29.07	0.10	0.25	0.07	0.16	0.01	100.01
" 60"	S-1990 (0.25-0.5mm)	Cr-spinel	11.86	10.04	0.13	0.00	0.08	6.39	0.34	40.88	0.30	29.19	0.05	0.12	0.10	0.29	0.00	99.77
" 64"	S-1990 (0.25-0.5mm)	Cr-spinel	11.79	10.05	0.14	0.06	0.07	4.70	0.33	45.35	0.34	26.64	0.07	0.26	0.11	0.08	0.03	100.03
" 65"	S-1990 (0.25-0.5mm)	Cr-spinel	11.65	10.40	0.11	0.07	0.05	5.66	0.41	41.15	0.26	27.98	0.03	0.10	0.13	0.23	0.10	98.31
" 66"	S-1990 (0.25-0.5mm)	Cr-spinel	11.87	9.98	0.16	0.02	0.02	6.58	0.50	40.19	0.21	29.35	0.04	0.13	0.06	0.10	0.11	99.31
" 67"	S-1990 (0.25-0.5mm)	spinel	13.08	8.04	0.43	0.04	0.11	13.67	0.24	8.15	0.74	51.40	0.07	0.01	0.00	0.17	0.00	96.14
" 68"	S-1990 (0.25-0.5mm)	Cr-spinel	11.70	9.94	0.11	0.00	0.00	6.49	0.35	41.01	0.27	29.14	0.13	0.21	0.04	0.13	0.00	99.52
" 69"	S-1990 (0.25-0.5mm)	Cr-spinel	12.61	10.14	0.14	0.07	0.00	5.91	0.43	41.83	0.30	27.45	0.04	0.21	0.08	0.11	0.00	99.32
" 70"	S-1990 (0.25-0.5mm)	Cr-spinel	12.05	10.95	0.10	0.08	0.00	5.58	0.27	41.60	0.24	27.25	0.08	0.21	0.17	0.29	0.16	99.02
" 71"	S-1990 (0.25-0.5mm)	spinel	12.73	6.73	0.15	0.08	0.10	20.95	0.40	0.48	0.55	54.84	0.10	0.15	0.07	0.12	0.00	97.46
" 72"	S-1990 (0.25-0.5mm)	Cr-spinel	12.55	9.46	0.05	0.01	0.06	5.93	0.42	44.20	0.13	27.04	0.00	0.23	0.10	0.26	0.00	100.43
" 73"	S-1990 (0.25-0.5mm)	Cr-spinel	12.26	9.30	0.13	0.01	0.02	5.72	0.35	44.24	0.23	26.84	0.02	0.17	0.11	0.19	0.00	99.58
" 74"	S-1990 (0.25-0.5mm)	Cr-spinel	12.73	9.51	0.17	0.00	0.00	5.92	0.36	43.35	0.13	27.02	0.09	0.19	0.04	0.19	0.13	99.83
" 75"	S-1990 (0.25-0.5mm)	Cr-spinel	12.35	9.08	0.15	0.09	0.00	5.51	0.32	45.08	0.24	25.91	0.17	0.16	0.06	0.21	0.00	99.34
" 76"	S-1990 (0.25-0.5mm)	Cr-spinel	12.54	9.53	0.12	0.01	0.00	5.18	0.29	45.45	0.28	26.08	0.09	0.19	0.12	0.19	0.03	100.09
" 77"	S-1990 (0.25-0.5mm)	Cr-spinel	11.43	9.86	0.10	0.00	0.00	4.64	0.47	46.03	0.28	26.39	0.06	0.19	0.15	0.18	0.11	99.91
" 78"	S-1990 (0.25-0.5mm)	Cr-spinel	11.92	9.41	0.12	0.04	0.00	5.63	0.34	45.12	0.32	26.65	0.01	0.13	0.10	0.19	0.00	99.96
" 79"	S-1990 (0.25-0.5mm)	magnetite	0.00	0.37	0.05	0.06	0.00	0.00	0.33	0.16	0.12	91.63	0.00	0.02	0.03	0.00	0.25	93.01
" 80"	S-1990 (0.25-0.5mm)	Cr-spinel	12.40	9.30	0.17	0.01	0.01	5.79	0.41	43.65	0.24	27.46	0.04	0.20	0.11	0.18	0.07	100.04
" 81"	S-1990 (0.25-0.5mm)	Cr-spinel	12.23	9.04	0.09	0.00	0.03	5.50	0.36	45.15	0.21	26.32	0.16	0.24	0.12	0.20	0.07	99.71
" 82"	S-1990 (0.25-0.5mm)	Cr-spinel	12.02	10.37	0.14	0.05	0.00	5.12	0.28	43.26	0.25	26.79	0.10	0.22	0.04	0.21	0.00	98.85
" 84"	S-1990 (0.25-0.5mm)	Cr-spinel	12.09	11.84	0.07	0.08	0.00	5.30	0.35	42.33	0.31	27.31	0.07	0.23	0.16	0.28	0.00	100.40
" 85"	S-1990 (0.25-0.5mm)	Cr-spinel	12.99	11.21	0.08	0.01	0.00	5.60	0.31	42.59	0.24	26.03	0.10	0.12	0.01	0.24	0.00	99.55
" 86"	S-1990 (0.25-0.5mm)	Cr-spinel	12.39	9.25	0.13	0.00	0.02	5.60	0.32	44.77	0.14	26.25	0.16	0.25	0.04	0.17	0.00	99.50

Appendix E.2
Mineral chemistry for all picked grains
OXIDES

Grain	Sample ID	Mineral	MgO	Al2O3	SiO2	SO3	CaO	TiO2	V2O3	Cr2O3	MnO	FeO	CoO	NiO	ZnO	As2O3	Nb2O5	TOTAL
" 87"	S-1990 (0.25-0.5mm)	Cr-spinel	12.27	10.06	0.11	0.00	0.04	5.81	0.37	42.44	0.27	27.04	0.10	0.24	0.19	0.20	0.10	99.24
" 88"	S-1990 (0.25-0.5mm)	Cr-spinel	12.76	9.63	0.11	0.10	0.00	6.09	0.44	42.93	0.26	27.27	0.05	0.23	0.05	0.23	0.06	100.20
" 89"	S-1990 (0.25-0.5mm)	Cr-spinel	11.59	9.57	0.14	0.00	0.00	4.47	0.39	47.37	0.32	25.76	0.09	0.24	0.04	0.13	0.00	100.11
" 90"	S-1990 (0.25-0.5mm)	Cr-spinel	12.31	10.80	0.07	0.00	0.00	5.70	0.29	43.08	0.26	27.10	0.10	0.21	0.16	0.27	0.10	100.44
" 91"	S-1990 (0.25-0.5mm)	magnetite	0.35	0.52	0.00	0.00	0.01	0.22	0.83	0.24	0.05	90.75	0.11	0.17	0.10	0.20	0.00	93.54
" 92"	S-1990 (0.25-0.5mm)	Cr-spinel	11.75	10.29	0.09	0.03	0.01	6.36	0.25	39.87	0.20	29.57	0.14	0.19	0.12	0.23	0.07	99.18
" 93"	S-1990 (0.25-0.5mm)	Cr-spinel	12.48	9.61	0.13	0.00	0.00	5.74	0.37	44.10	0.24	26.91	0.10	0.22	0.01	0.20	0.07	100.18
" 94"	S-1990 (0.25-0.5mm)	Cr-spinel	12.97	9.54	0.10	0.13	0.00	5.61	0.47	44.62	0.33	25.92	0.03	0.19	0.16	0.28	0.01	100.39
" 95"	S-1990 (0.25-0.5mm)	Cr-spinel	11.50	10.07	0.09	0.06	0.09	5.90	0.39	41.46	0.31	29.31	0.11	0.14	0.02	0.16	0.03	99.63
" 96"	S-1990 (0.25-0.5mm)	Cr-spinel	12.62	9.55	0.09	0.14	0.00	5.88	0.35	44.71	0.32	25.57	0.01	0.18	0.06	0.05	0.20	99.73
" 97"	S-1990 (0.25-0.5mm)	Cr-spinel	12.29	9.59	0.15	0.00	0.02	6.13	0.34	42.80	0.35	27.32	0.04	0.24	0.13	0.09	0.00	99.50
" 98"	S-1990 (0.25-0.5mm)	Cr-spinel	12.33	10.49	0.10	0.00	0.00	6.23	0.28	42.04	0.31	27.32	0.10	0.18	0.00	0.19	0.03	99.60
" 99"	S-1990 (0.25-0.5mm)	Cr-spinel	12.32	9.99	0.11	0.08	0.02	6.10	0.47	41.76	0.17	27.94	0.06	0.20	0.11	0.14	0.07	99.54
" 100"	S-1990 (0.25-0.5mm)	Cr-spinel	11.90	10.41	0.05	0.00	0.04	5.68	0.47	43.10	0.18	27.91	0.09	0.20	0.00	0.22	0.00	100.25
" 101"	S-1990 (0.25-0.5mm)	Cr-spinel	12.95	12.32	0.14	0.06	0.02	5.53	0.36	42.59	0.24	25.43	0.06	0.24	0.15	0.30	0.06	100.44
" 102"	S-1990 (0.25-0.5mm)	Cr-spinel	12.28	10.62	0.09	0.00	0.00	5.82	0.21	42.42	0.27	26.81	0.07	0.15	0.00	0.17	0.00	98.90
" 103"	S-1990 (0.25-0.5mm)	Cr-spinel	11.96	9.85	0.15	0.06	0.00	5.48	0.27	43.47	0.22	27.24	0.06	0.17	0.08	0.21	0.00	99.24
" 104"	S-1990 (0.25-0.5mm)	Cr-spinel	11.33	9.73	0.10	0.00	0.02	6.53	0.33	40.47	0.25	29.47	0.06	0.21	0.13	0.26	0.03	98.92
" 105"	S-1990 (0.25-0.5mm)	ilmenite	0.90	0.09	0.09	0.02	0.02	49.21	0.37	0.02	0.58	48.25	0.01	0.00	0.24	0.07	0.23	100.09
" 106"	S-1990 (0.25-0.5mm)	Cr-spinel	11.61	10.34	0.11	0.00	0.04	5.14	0.29	44.34	0.22	26.83	0.12	0.30	0.09	0.36	0.00	99.76
" 107"	S-1990 (0.25-0.5mm)	Cr-spinel	11.91	11.03	0.11	0.20	0.00	5.56	0.29	42.58	0.32	28.14	0.00	0.22	0.05	0.21	0.00	100.62
" 108"	S-1990 (0.25-0.5mm)	Cr-spinel	12.41	11.18	0.07	0.00	0.00	5.37	0.44	42.86	0.25	26.07	0.05	0.20	0.01	0.35	0.03	99.29
" 109"	S-1990 (0.25-0.5mm)	ilmenite	0.94	0.04	0.04	0.07	0.06	46.64	0.48	0.00	0.51	50.33	0.11	0.00	0.07	0.04	0.00	99.33
" 110"	S-1990 (0.25-0.5mm)	Cr-spinel	12.17	10.72	0.11	0.13	0.01	5.89	0.30	40.73	0.28	27.75	0.04	0.24	0.26	0.26	0.06	98.93
" 111"	S-1990 (0.25-0.5mm)	Cr-spinel	12.15	11.09	0.11	0.05	0.00	6.14	0.41	40.51	0.18	28.08	0.07	0.20	0.13	0.08	0.00	99.20
" 112"	S-1990 (0.25-0.5mm)	ilmenite	0.66	0.03	0.03	0.00	0.03	46.15	0.25	0.09	0.66	51.26	0.03	0.03	0.11	0.00	0.03	99.36
" 113"	S-1990 (0.25-0.5mm)	Mg-ilmenite	13.95	0.83	0.83	0.00	0.08	52.38	0.40	4.38	0.30	29.22	0.05	0.08	0.00	0.20	0.01	102.70
" 114"	S-1990 (0.25-0.5mm)	Cr-spinel	12.13	9.86	0.11	0.00	0.01	5.49	0.40	44.76	0.23	25.96	0.01	0.12	0.00	0.19	0.04	99.29
" 115"	S-1990 (0.25-0.5mm)	Cr-spinel	12.15	9.52	0.12	0.00	0.00	6.09	0.56	43.96	0.22	27.34	0.08	0.26	0.09	0.11	0.14	100.64
" 116"	S-1990 (0.25-0.5mm)	Cr-spinel	11.64	8.88	0.09	0.00	0.01	8.89	0.32	30.61	0.44	37.22	0.06	0.15	0.13	0.22	0.00	98.65
" 117"	S-1990 (0.25-0.5mm)	Cr-spinel	11.36	9.50	0.16	0.03	0.01	4.42	0.23	46.82	0.24	26.03	0.01	0.25	0.03	0.26	0.00	99.38
" 118"	S-1990 (0.25-0.5mm)	ilmenite	0.98	0.06	0.06	0.00	0.05	49.55	0.09	0.05	0.86	49.15	0.04	0.06	0.06	0.08	0.03	101.11
" 119"	S-1990 (0.25-0.5mm)	Cr-spinel	11.62	10.28	0.11	0.10	0.01	5.48	0.36	43.89	0.17	27.25	0.13	0.22	0.00	0.25	0.00	99.88
" 120"	S-1990 (0.25-0.5mm)	Cr-spinel	11.87	9.01	0.07	0.00	0.01	5.85	0.26	44.98	0.23	26.28	0.00	0.25	0.01	0.19	0.00	99.02
" 121"	S-1990 (0.25-0.5mm)	Cr-spinel	12.15	9.81	0.07	0.00	0.01	6.17	0.38	43.34	0.17	27.33	0.10	0.25	0.00	0.27	0.09	100.15
" 122"	S-1990 (0.25-0.5mm)	Cr-spinel	11.72	10.24	0.09	0.00	0.01	5.41	0.20	42.73	0.19	28.47	0.03	0.23	0.00	0.10	0.10	99.53
" 123"	S-1990 (0.25-0.5mm)	Cr-spinel	11.99	9.85	0.05	0.10	0.05	4.35	0.27	46.93	0.21	25.94	0.01	0.19	0.07	0.27	0.20	100.50
" 124"	S-1990 (0.25-0.5mm)	Cr-spinel	12.25	10.08	0.09	0.00	0.00	4.17	0.30	47.40	0.24	24.91	0.07	0.21	0.00	0.20	0.01	99.94
" 126"	S-1990 (0.25-0.5mm)	Cr-spinel	12.01	11.27	0.08	0.00	0.00	5.61	0.42	41.33	0.25	27.39	0.09	0.17	0.12	0.17	0.00	98.92
" 127"	S-1990 (0.25-0.5mm)	Cr-spinel	11.57	9.56	0.14	0.04	0.19	4.06	0.41	47.84	0.27	25.52	0.03	0.21	0.00	0.22	0.00	100.05
" 128"	S-1990 (0.25-0.5mm)	Cr-spinel	11.57	9.86	0.10	0.00	0.00	6.55	0.33	40.63	0.31	29.28	0.13	0.21	0.10	0.24	0.04	99.35
" 129"	S-1990 (0.25-0.5mm)	Cr-spinel	12.54	11.72	0.11	0.00	0.00	5.65	0.42	42.08	0.23	26.90	0.06	0.23	0.05	0.18	0.19	100.37
" 130"	S-1990 (0.25-0.5mm)	Cr-spinel	12.28	11.87	0.06	0.04	0.00	4.94	0.28	43.34	0.23	26.47	0.00	0.18	0.16	0.16	0.01	100.04

Appendix E.2
Mineral chemistry for all picked grains
OXIDES

Grain	Sample ID	Mineral	MgO	Al2O3	SiO2	SO3	CaO	TiO2	V2O3	Cr2O3	MnO	FeO	CoO	NiO	ZnO	As2O3	Nb2O5	TOTAL
" 131"	S-1990 (0.25-0.5mm)	Cr-spinel	12.19	10.56	0.12	0.00	0.00	6.09	0.32	41.10	0.30	27.19	0.05	0.04	0.04	0.09	0.00	98.10
" 132"	S-1990 (0.25-0.5mm)	Cr-spinel	13.20	11.87	0.12	0.03	0.01	5.20	0.41	43.97	0.33	25.20	0.06	0.21	0.12	0.25	0.11	101.11
" 134"	S-1990 (0.25-0.5mm)	Mg-ilmenite	7.17	0.24	0.24	0.00	0.28	50.32	0.30	0.08	0.67	40.75	0.07	0.02	0.00	0.08	0.24	100.47
" 135"	S-1990 (0.25-0.5mm)	Cr-spinel	11.80	9.40	0.07	0.00	0.02	6.47	0.32	40.98	0.27	29.71	0.04	0.17	0.20	0.17	0.07	99.69
" 136"	S-1990 (0.25-0.5mm)	Cr-spinel	12.40	9.57	0.16	0.00	0.02	5.14	0.30	46.05	0.15	25.34	0.00	0.27	0.07	0.21	0.01	99.70
" 137"	S-1990 (0.25-0.5mm)	Cr-spinel	12.40	11.25	0.09	0.00	0.01	5.73	0.38	41.57	0.24	27.36	0.11	0.19	0.00	0.29	0.00	99.62
" 138"	S-1990 (0.25-0.5mm)	spinel	13.27	5.20	0.08	0.00	0.05	24.48	0.21	2.12	0.68	52.22	0.05	0.14	0.13	0.25	0.04	98.93
" 139"	S-1990 (0.25-0.5mm)	Cr-spinel	11.34	10.06	0.12	0.04	0.03	4.22	0.26	47.08	0.21	25.94	0.12	0.18	0.19	0.25	0.00	100.05
" 140"	S-1990 (0.25-0.5mm)	Cr-spinel	12.36	9.22	0.08	0.00	0.02	5.60	0.18	44.61	0.24	26.17	0.02	0.19	0.11	0.24	0.07	99.10
" 141"	S-1990 (0.25-0.5mm)	Mg-ilmenite	3.70	0.00	0.00	0.05	0.09	49.99	0.25	0.01	0.81	44.71	0.08	0.03	0.04	0.24	0.00	99.99
" 142"	S-1990 (0.25-0.5mm)	Cr-spinel	11.79	10.49	0.09	0.01	0.00	6.18	0.18	41.13	0.27	28.46	0.05	0.22	0.17	0.22	0.07	99.33
" 143"	S-1990 (0.25-0.5mm)	Cr-spinel	12.43	10.12	1.30	0.03	0.04	6.46	0.47	39.54	0.30	27.58	0.09	0.19	0.08	0.24	0.00	98.86
" 144"	S-1990 (0.25-0.5mm)	Cr-spinel	12.31	10.28	0.12	0.00	0.00	5.68	0.41	43.42	0.27	26.93	0.08	0.26	0.21	0.17	0.00	100.14
" 145"	S-1990 (0.25-0.5mm)	Cr-spinel	11.76	9.31	0.08	0.00	0.02	5.89	0.32	42.98	0.31	28.14	0.11	0.21	0.08	0.34	0.00	99.55
" 146"	S-1990 (0.25-0.5mm)	Cr-spinel	11.83	9.87	0.08	0.05	0.00	6.77	0.26	40.87	0.19	29.98	0.12	0.21	0.04	0.06	0.00	100.35
" 147"	S-1990 (0.25-0.5mm)	Cr-spinel	11.30	9.82	0.10	0.01	0.00	4.25	0.23	46.00	0.26	26.29	0.10	0.13	0.04	0.30	0.07	98.91
" 148"	S-1990 (0.25-0.5mm)	spinel	13.23	5.89	0.15	0.00	0.05	21.97	0.22	1.94	0.68	53.65	0.00	0.02	0.01	0.19	0.07	98.06
" 149"	S-1990 (0.25-0.5mm)	Cr-spinel	12.60	10.42	0.11	0.05	0.03	6.12	0.41	41.99	0.21	27.27	0.00	0.23	0.13	0.10	0.00	99.66
" 151"	S-1990 (0.25-0.5mm)	ilmenite	2.92	0.26	0.26	0.06	0.13	48.31	0.26	0.05	0.37	47.20	0.11	0.00	0.00	0.19	0.05	100.18
" 152"	S-1990 (0.25-0.5mm)	spinel	11.33	8.47	2.24	0.14	0.15	20.00	0.31	3.10	0.62	49.38	0.09	0.85	0.25	0.29	0.03	97.24
" 153"	S-1990 (0.25-0.5mm)	Cr-spinel	11.74	10.94	0.13	0.00	0.05	4.89	0.42	43.73	0.32	27.62	0.08	0.16	0.10	0.14	0.10	100.43
" 154"	S-1990 (0.25-0.5mm)	Cr-spinel	12.02	9.32	0.14	0.03	0.00	5.67	0.37	43.91	0.23	26.85	0.13	0.25	0.00	0.13	0.00	99.05
" 155"	S-1990 (0.25-0.5mm)	Cr-spinel	12.40	11.12	0.08	0.08	0.00	5.94	0.33	41.54	0.28	27.52	0.05	0.12	0.04	0.25	0.13	99.89
" 156"	S-1990 (0.25-0.5mm)	ilmenite	1.14	0.42	0.42	0.00	0.04	49.40	0.36	0.07	0.64	47.67	0.08	0.05	0.04	0.03	0.08	100.43
" 157"	S-1990 (0.25-0.5mm)	Mg-ilmenite	3.86	0.07	0.07	0.00	0.12	51.19	0.31	0.06	0.72	44.14	0.12	0.00	0.00	0.00	0.00	100.67
" 158"	S-1990 (0.25-0.5mm)	Cr-spinel	12.15	10.84	0.10	0.00	0.01	5.33	0.37	42.72	0.22	26.73	0.12	0.12	0.00	0.22	0.11	99.02
" 159"	S-1990 (0.25-0.5mm)	Cr-spinel	11.84	10.12	0.13	0.00	0.01	5.50	0.37	43.72	0.17	27.35	0.02	0.13	0.12	0.23	0.10	99.81
" 161"	S-1990 (0.25-0.5mm)	Cr-spinel	12.38	10.26	0.11	0.00	0.01	5.71	0.41	43.36	0.31	26.40	0.05	0.21	0.06	0.31	0.01	99.59
" 164"	S-1990 (0.25-0.5mm)	Cr-spinel	11.57	9.86	0.08	0.00	0.04	6.70	0.37	39.94	0.25	30.04	0.01	0.23	0.04	0.15	0.00	99.29
" 166"	S-1990 (0.25-0.5mm)	Cr-spinel	12.37	9.85	0.12	0.00	0.01	5.29	0.39	45.06	0.30	26.06	0.00	0.19	0.12	0.08	0.04	99.90
" 167"	S-1990 (0.25-0.5mm)	Cr-spinel	13.14	12.32	0.09	0.01	0.00	5.47	0.25	42.46	0.21	24.99	0.13	0.20	0.14	0.04	0.06	99.50
" 168"	S-1990 (0.25-0.5mm)	Cr-spinel	11.28	9.76	0.07	0.02	0.01	6.48	0.28	39.84	0.24	29.25	0.12	0.21	0.15	0.32	0.00	98.03
" 169"	S-1990 (0.25-0.5mm)	Cr-spinel	12.13	10.51	0.12	0.03	0.00	5.94	0.38	41.63	0.25	27.90	0.08	0.18	0.04	0.19	0.11	99.52
" 170"	S-1990 (0.25-0.5mm)	ilmenite	1.29	0.21	0.21	0.09	0.18	48.33	0.49	0.00	0.25	49.09	0.03	0.00	0.04	0.08	0.07	100.36
" 171"	S-1990 (0.25-0.5mm)	Cr-spinel	12.69	9.80	0.14	0.12	0.00	4.28	0.35	46.89	0.18	24.43	0.05	0.15	0.19	0.12	0.03	99.40
" 172"	S-1990 (0.25-0.5mm)	Cr-spinel	12.16	9.29	0.08	0.00	0.00	6.35	0.34	42.75	0.31	27.30	0.03	0.20	0.05	0.18	0.00	99.04
" 173"	S-1990 (0.25-0.5mm)	Cr-spinel	12.03	9.42	0.16	0.06	0.02	5.39	0.31	44.57	0.39	26.64	0.10	0.25	0.00	0.23	0.07	99.64
" 174"	S-1990 (0.25-0.5mm)	spinel	12.72	6.87	0.11	0.01	0.08	18.50	0.24	4.69	0.56	53.98	0.05	0.13	0.14	0.15	0.17	98.39
" 175"	S-1990 (0.25-0.5mm)	Cr-spinel	12.77	9.47	0.11	0.00	0.00	5.82	0.31	44.27	0.25	25.91	0.00	0.26	0.00	0.21	0.08	99.46
" 176"	S-1990 (0.25-0.5mm)	Cr-spinel	12.52	9.40	0.05	0.00	0.00	5.32	0.35	45.57	0.28	25.53	0.04	0.14	0.00	0.20	0.21	99.60
" 177"	S-1990 (0.25-0.5mm)	ilmenite	1.03	0.07	0.07	0.00	0.00	49.26	0.19	0.07	0.80	48.46	0.09	0.06	0.18	0.01	0.05	100.34
" 178"	S-1990 (0.25-0.5mm)	Cr-spinel	12.01	9.13	0.14	0.07	0.02	5.96	0.34	43.80	0.23	26.60	0.10	0.23	0.14	0.14	0.00	98.89
" 179"	S-1990 (0.25-0.5mm)	Cr-spinel	12.54	11.37	0.15	0.02	0.05	5.65	0.37	41.74	0.30	26.68	0.04	0.20	0.16	0.27	0.00	99.52

Appendix E.2
Mineral chemistry for all picked grains
OXIDES

Grain	Sample ID	Mineral	MgO	Al2O3	SiO2	SO3	CaO	TiO2	V2O3	Cr2O3	MnO	FeO	CoO	NiO	ZnO	As2O3	Nb2O5	TOTAL
Kimberlite sample 98-J-14:																		
" 2-71"	98-J-14 (0.5-1mm)	Cr-spinel	11.23	8.04	0.11	0.02	0.01	7.33	0.54	38.72	0.24	31.37	0.12	0.27	0.14	0.21	0.04	98.39
" 72"	98-J-14 (0.5-1mm)	Cr-spinel	11.45	7.94	0.05	0.00	0.02	8.00	0.16	37.62	0.32	32.38	0.09	0.15	0.17	0.03	0.00	98.39
" 73"	98-J-14 (0.5-1mm)	Cr-spinel	12.42	8.53	0.07	0.00	0.00	7.40	0.29	39.82	0.29	29.48	0.09	0.13	0.02	0.13	0.03	98.69
" 4-245"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.51	9.15	0.13	0.03	0.02	4.57	0.32	45.25	0.28	27.51	0.08	0.17	0.04	0.27	0.14	99.46
" 246"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.30	8.79	0.15	0.02	0.00	5.48	0.34	43.53	0.29	29.03	0.07	0.28	0.05	0.33	0.14	99.81
" 247"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.49	8.34	0.10	0.00	0.00	7.52	0.24	38.32	0.24	31.04	0.03	0.30	0.15	0.13	0.06	97.97
" 248"	98-J-14 (0.25-0.5mm)	Cr-spinel	12.31	8.69	0.09	0.02	0.01	6.20	0.36	43.07	0.24	27.74	0.03	0.13	0.14	0.29	0.00	99.30
" 249"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.43	9.05	0.08	0.00	0.00	5.33	0.27	43.18	0.21	29.53	0.03	0.11	0.13	0.25	0.00	99.61
" 250"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.17	8.27	0.18	0.00	0.03	7.32	0.20	39.03	0.24	32.19	0.02	0.22	0.00	0.07	0.00	98.94
" 251"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.59	8.80	0.08	0.06	0.01	6.61	0.44	41.08	0.27	30.03	0.00	0.29	0.06	0.14	0.00	99.47
" 252"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.50	8.42	0.08	0.03	0.01	7.56	0.44	38.32	0.24	31.64	0.04	0.22	0.11	0.25	0.00	98.85
" 253"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.47	8.05	0.03	0.08	0.01	7.84	0.45	37.91	0.35	32.70	0.04	0.20	0.00	0.11	0.18	99.42
" 254"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.46	8.98	0.12	0.02	0.03	6.23	0.42	41.29	0.25	29.74	0.08	0.21	0.03	0.18	0.00	99.05
" 255"	98-J-14 (0.25-0.5mm)	Mg-ilmenite	11.72	0.71	0.06	0.00	0.11	49.36	0.50	6.93	0.19	30.22	0.11	0.12	0.00	0.22	0.00	100.24
" 256"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.71	10.91	0.10	0.02	0.00	7.09	0.43	37.55	0.25	30.43	0.10	0.27	0.04	0.14	0.00	99.05
" 257"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.60	8.92	0.09	0.02	0.00	6.61	0.38	41.50	0.22	29.54	0.02	0.23	0.12	0.15	0.08	99.49
" 258"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.49	8.89	0.13	0.01	0.00	7.25	0.35	38.66	0.31	31.99	0.05	0.27	0.00	0.21	0.00	99.61
" 259"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.37	9.09	0.11	0.03	0.03	6.75	0.38	39.32	0.19	30.80	0.06	0.25	0.13	0.22	0.00	98.75
" 260"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.71	8.43	0.08	0.00	0.03	7.29	0.48	38.50	0.26	31.26	0.05	0.29	0.11	0.10	0.00	98.58
" 261"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.77	8.81	0.09	0.03	0.03	7.10	0.40	38.50	0.17	31.32	0.07	0.20	0.03	0.20	0.16	98.89
" 262"	98-J-14 (0.25-0.5mm)	Cr-spinel	12.28	8.84	0.14	0.00	0.04	7.26	0.33	38.86	0.29	31.16	0.02	0.27	0.14	0.12	0.13	99.87
" 263"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.35	8.35	0.08	0.10	0.04	7.69	0.37	38.00	0.25	32.18	0.10	0.27	0.16	0.19	0.04	99.17
" 264"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.79	8.49	0.11	0.00	0.05	5.80	0.32	42.86	0.30	28.93	0.10	0.35	0.04	0.19	0.13	99.46
" 265"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.75	8.37	0.11	0.00	0.02	7.42	0.36	39.38	0.25	31.56	0.00	0.14	0.04	0.11	0.07	99.58
" 266"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.42	7.99	0.08	0.06	0.01	7.61	0.24	38.59	0.24	32.06	0.02	0.19	0.07	0.29	0.00	98.87
" 267"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.30	8.65	0.06	0.06	0.00	7.08	0.44	39.02	0.30	31.90	0.06	0.25	0.00	0.21	0.00	99.31
" 268"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.13	8.22	0.11	0.04	0.02	6.73	0.41	40.79	0.28	31.60	0.08	0.21	0.14	0.23	0.11	100.11
" 269"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.97	10.09	0.09	0.01	0.02	5.78	0.32	41.54	0.29	28.99	0.07	0.24	0.06	0.12	0.00	99.57
" 270"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.12	8.68	0.10	0.01	0.02	4.15	0.35	44.56	0.27	28.69	0.00	0.14	0.00	0.24	0.06	98.37
" 271"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.41	8.36	0.10	0.00	0.03	7.18	0.32	39.60	0.21	31.11	0.12	0.24	0.08	0.12	0.06	98.93
" 272"	98-J-14 (0.25-0.5mm)	Cr-spinel	12.19	9.22	0.10	0.00	0.00	6.89	0.42	40.29	0.24	30.72	0.03	0.25	0.07	0.12	0.00	100.52
" 273"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.45	8.24	0.12	0.05	0.00	7.20	0.34	39.94	0.24	31.11	0.04	0.24	0.07	0.18	0.00	99.23
" 274"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.24	8.77	0.05	0.11	0.03	6.57	0.37	39.48	0.26	31.06	0.04	0.20	0.00	0.20	0.10	98.48
" 275"	98-J-14 (0.25-0.5mm)	spinel	12.49	6.11	0.38	0.00	0.24	14.21	0.19	11.24	0.76	51.29	0.01	0.05	0.12	0.23	0.16	97.47
" 276"	98-J-14 (0.25-0.5mm)	Cr-spinel	12.27	8.32	0.10	0.06	0.00	6.69	0.40	39.99	0.31	29.06	0.00	0.23	0.06	0.14	0.03	97.67
" 277"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.82	8.77	0.15	0.04	0.01	7.24	0.31	38.19	0.26	31.12	0.09	0.26	0.08	0.06	0.00	98.40
" 278"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.41	8.60	0.08	0.09	0.00	7.16	0.48	39.56	0.30	31.08	0.00	0.21	0.06	0.22	0.06	99.30
" 279"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.53	8.71	0.11	0.02	0.04	4.00	0.27	46.38	0.27	26.64	0.14	0.21	0.00	0.32	0.10	98.73
" 280"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.28	8.32	0.13	0.08	0.03	6.77	0.20	40.35	0.29	31.48	0.10	0.21	0.00	0.11	0.00	99.36
" 281"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.67	8.57	0.11	0.00	0.00	7.41	0.43	39.13	0.22	31.62	0.08	0.24	0.07	0.20	0.09	99.84
" 283"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.19	8.24	0.09	0.00	0.01	7.12	0.33	39.79	0.29	31.54	0.05	0.24	0.00	0.20	0.00	99.09

Appendix E.2
Mineral chemistry for all picked grains
OXIDES

Grain	Sample ID	Mineral	MgO	Al2O3	SiO2	SO3	CaO	TiO2	V2O3	Cr2O3	MnO	FeO	CoO	NiO	ZnO	As2O3	Nb2O5	TOTAL
" 284"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.42	8.62	0.06	0.00	0.00	7.30	0.35	39.10	0.29	31.05	0.00	0.32	0.09	0.00	0.17	98.76
" 285"	98-J-14 (0.25-0.5mm)	Cr-spinel	12.13	8.51	0.09	0.01	0.03	7.00	0.52	39.30	0.23	30.18	0.04	0.25	0.09	0.18	0.13	98.70
" 286"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.35	8.45	0.34	0.07	0.02	6.99	0.31	38.78	0.36	31.18	0.10	0.26	0.09	0.29	0.18	98.77
" 287"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.11	9.38	0.10	0.11	0.00	4.78	0.32	42.83	0.26	28.77	0.00	0.21	0.09	0.09	0.08	98.15
" 288"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.42	8.86	0.07	0.00	0.00	7.37	0.42	38.30	0.27	31.35	0.08	0.20	0.00	0.22	0.00	98.57
" 289"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.62	8.63	0.06	0.10	0.00	7.33	0.37	38.71	0.23	31.61	0.11	0.17	0.08	0.23	0.00	99.25
" 290"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.46	8.63	0.06	0.08	0.00	7.47	0.58	38.02	0.29	32.19	0.09	0.24	0.08	0.22	0.00	99.42
" 291"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.65	8.75	0.10	0.11	0.00	6.55	0.34	40.10	0.19	29.76	0.09	0.22	0.08	0.29	0.03	98.26
" 293"	98-J-14 (0.25-0.5mm)	Cr-spinel	12.17	8.63	0.06	0.00	0.02	6.82	0.35	40.05	0.23	30.14	0.09	0.19	0.11	0.15	0.00	99.02
" 294"	98-J-14 (0.25-0.5mm)	Cr-spinel	12.50	9.15	0.12	0.05	0.00	6.97	0.53	40.30	0.27	29.39	0.00	0.22	0.05	0.26	0.00	99.81
" 295"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.54	8.51	0.13	0.00	0.01	6.42	0.49	41.05	0.30	30.00	0.08	0.26	0.00	0.20	0.00	98.98
" 296"	98-J-14 (0.25-0.5mm)	Cr-spinel	12.07	8.80	0.08	0.14	0.00	6.59	0.38	41.50	0.26	29.61	0.07	0.15	0.07	0.17	0.06	99.94
" 297"	98-J-14 (0.25-0.5mm)	Cr-spinel	12.06	9.05	0.09	0.02	0.02	7.18	0.44	39.74	0.23	29.72	0.00	0.28	0.13	0.21	0.00	99.18
" 299"	98-J-14 (0.25-0.5mm)	Cr-spinel	12.37	8.39	0.07	0.05	0.01	7.05	0.53	41.06	0.24	28.93	0.06	0.20	0.04	0.23	0.00	99.24
" 300"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.20	8.64	0.15	0.03	0.00	7.15	0.44	38.53	0.17	31.65	0.00	0.24	0.02	0.20	0.00	98.40
" 301"	98-J-14 (0.25-0.5mm)	Cr-spinel	12.09	8.74	0.09	0.03	0.02	6.58	0.39	40.62	0.16	29.59	0.10	0.19	0.10	0.12	0.10	98.93
" 302"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.29	8.20	0.12	0.06	0.00	7.30	0.35	39.19	0.34	31.87	0.11	0.11	0.08	0.15	0.00	99.18
" 303"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.19	9.05	0.11	0.00	0.00	5.73	0.35	40.30	0.26	30.85	0.09	0.25	0.18	0.12	0.00	98.47
" 305"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.48	8.20	0.06	0.00	0.00	7.73	0.19	37.40	0.34	33.11	0.05	0.24	0.11	0.23	0.00	99.13
" 307"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.09	8.56	0.06	0.00	0.01	4.38	0.30	45.88	0.27	27.29	0.03	0.25	0.15	0.16	0.00	98.43
" 308"	98-J-14 (0.25-0.5mm)	spinel	11.91	7.21	1.14	0.03	0.07	10.62	0.33	20.83	0.58	45.77	0.08	0.01	0.08	0.11	0.10	98.88
" 309"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.70	8.86	0.13	0.02	0.00	5.38	0.37	43.77	0.40	28.12	0.08	0.23	0.00	0.06	0.08	99.21
" 310"	98-J-14 (0.25-0.5mm)	Cr-spinel	12.32	8.56	0.11	0.04	0.03	6.99	0.48	40.85	0.16	29.51	0.09	0.31	0.10	0.27	0.00	99.83
" 311"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.33	8.03	0.10	0.05	0.01	7.86	0.38	37.42	0.29	32.49	0.00	0.26	0.02	0.10	0.00	98.35
" 312"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.46	8.71	0.16	0.00	0.06	6.07	0.34	42.09	0.39	29.86	0.04	0.25	0.09	0.20	0.07	99.79
" 313"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.06	9.36	0.10	0.04	0.03	5.61	0.28	42.02	0.33	29.28	0.02	0.23	0.11	0.16	0.00	98.63
" 4-315"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.18	8.41	0.10	0.03	0.02	7.20	0.45	38.57	0.28	31.54	0.05	0.25	0.00	0.28	0.11	98.47
" 316"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.35	8.49	0.08	0.03	0.00	6.61	0.38	40.54	0.27	30.83	0.06	0.30	0.00	0.15	0.16	99.25
" 317"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.75	8.79	0.09	0.01	0.01	7.15	0.37	38.64	0.27	31.31	0.03	0.14	0.16	0.16	0.01	98.90
" 318"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.49	8.64	0.03	0.00	0.00	7.29	0.32	40.56	0.25	30.93	0.11	0.23	0.09	0.08	0.00	100.01
" 319"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.41	8.67	0.11	0.00	0.00	7.34	0.31	39.16	0.28	31.26	0.08	0.27	0.03	0.13	0.00	99.07
" 320"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.48	7.90	0.14	0.00	0.03	7.14	0.45	39.67	0.25	31.48	0.10	0.21	0.20	0.21	0.20	99.46
" 321"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.78	8.94	0.10	0.00	0.00	7.13	0.34	38.86	0.26	30.88	0.14	0.24	0.00	0.15	0.11	98.92
" 322"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.17	8.88	0.10	0.01	0.03	4.51	0.33	43.41	0.41	29.59	0.06	0.14	0.01	0.18	0.17	98.99
" 323"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.85	9.07	0.14	0.00	0.03	6.68	0.43	38.98	0.23	29.47	0.00	0.20	0.00	0.14	0.00	97.23
" 324"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.47	8.24	0.12	0.10	0.00	7.09	0.36	39.20	0.35	30.97	0.07	0.27	0.02	0.20	0.00	98.46
" 325"	98-J-14 (0.25-0.5mm)	Cr-spinel	12.07	8.63	0.06	0.08	0.00	7.41	0.36	38.70	0.26	32.15	0.03	0.25	0.08	0.19	0.00	100.27
" 326"	98-J-14 (0.25-0.5mm)	Cr-spinel	11.74	8.75	0.03	0.03	0.01	6.97	0.53	38.79	0.25	30.79	0.10	0.29	0.21	0.15	0.17	98.82
Rankin Inlet till samples (0.5-1 mm):																		
" 2-77"	97MOB0127	rutile, anatase	0.01	0.12	0.04	0.03	0.03	100.17	0.69	0.00	0.00	0.67	0.04	0.06	0.06	0.11	0.00	102.03
" 2-93"	98MOB0114	ilmenite	0.06	0.04	0.02	0.07	0.00	48.62	0.37	0.00	1.98	48.25	0.06	0.07	0.00	0.11	0.01	99.66
" 2-96"	98MOB0157	magnetite	0.02	0.09	0.14	0.00	0.00	0.09	0.22	0.00	0.04	89.05	0.03	0.01	0.05	0.04	0.00	89.77

Appendix E.2
Mineral chemistry for all picked grains
OXIDES

Grain	Sample ID	Mineral	MgO	Al2O3	SiO2	SO3	CaO	TiO2	V2O3	Cr2O3	MnO	FeO	CoO	NiO	ZnO	As2O3	Nb2O5	TOTAL
" 97"	98MOB0161	ilmenite	0.38	0.07	0.06	0.14	0.02	50.59	0.28	0.05	2.22	46.41	0.03	0.06	0.00	0.02	0.03	100.35
" 2-102"	98MOB0217	ilmenite	0.17	0.03	0.04	0.00	0.00	50.81	0.29	0.04	1.39	47.06	0.05	0.00	0.13	0.01	0.00	100.03
Rankin Inlet till samples (0.25-0.5mm):																		
" 3-3"	97MOB0097	ilmenite	0.21	0.00	0.05	0.01	0.00	50.82	0.19	0.09	1.60	47.40	0.08	0.04	0.00	0.19	0.00	100.67
" 3-42"	**97MOB0106**	**Cr-spinel**	8.32	17.86	0.02	0.08	0.00	0.08	0.30	50.49	0.43	21.63	0.12	0.01	1.18	0.17	0.00	100.69
" 43"	97MOB0106	ilmenite	0.20	0.04	0.00	0.05	0.00	50.99	0.40	0.03	0.45	47.81	0.05	0.03	0.01	0.06	0.16	100.29
" 44"	97MOB0106	rutile, anatase	0.05	0.02	0.04	0.00	0.00	99.04	0.60	0.46	0.01	0.28	0.07	0.02	0.11	0.07	0.09	100.86
" 3-79"	97MOB0107	ilmenite	0.02	0.12	0.05	0.14	0.00	49.40	0.54	0.03	1.12	48.03	0.11	0.02	0.00	0.06	0.07	99.72
" 3-124"	97MOB0127	ilmenite	0.07	0.06	0.04	0.00	0.00	51.20	0.20	0.00	1.90	46.23	0.04	0.00	0.03	0.07	0.24	100.08
" 3-156"	97MOB0132	ilmenite	0.40	0.06	0.01	0.00	0.03	51.17	0.30	0.06	1.32	46.99	0.00	0.04	0.08	0.01	0.00	100.47
" 157"	97MOB0132	ilmenite	0.10	0.89	0.14	0.02	0.02	50.08	0.33	0.10	0.94	46.87	0.18	0.00	0.00	0.26	0.00	99.93
" 158"	97MOB0132	ilmenite	0.16	0.07	0.06	0.00	0.00	51.80	0.35	0.00	0.14	47.96	0.05	0.00	0.00	0.06	0.00	100.64
" 3-167"	97MOB0138	ilmenite	0.52	0.01	0.03	0.05	0.00	52.62	0.21	0.06	1.93	45.07	0.04	0.03	0.15	0.03	0.15	100.90
" 168"	97MOB0138	rutile, anatase	0.04	2.70	0.07	0.06	0.05	92.47	0.57	0.13	0.00	0.65	0.04	0.01	0.01	0.00	0.84	97.64
" 169"	97MOB0138	ilmenite	0.16	0.11	0.01	0.07	0.01	51.94	0.22	0.06	1.61	46.75	0.00	0.05	0.00	0.01	0.03	101.02
" 170"	97MOB0138	ilmenite	0.06	0.06	0.02	0.09	0.00	52.18	0.30	0.02	1.52	46.42	0.00	0.07	0.00	0.05	0.00	100.79
" 3-204"	97MOB0161	ilmenite	1.65	0.13	0.01	0.00	0.01	51.88	0.20	0.05	1.91	44.40	0.09	0.00	0.04	0.06	0.04	100.48
" 3-209"	97MOB0166	ilmenite	0.44	0.06	0.00	0.03	0.02	52.31	0.30	0.02	2.42	44.68	0.05	0.04	0.08	0.00	0.35	100.80
" 210"	97MOB0166	rutile, anatase	0.02	0.12	0.01	0.00	0.02	98.27	0.82	0.54	0.00	0.15	0.01	0.00	0.08	0.03	0.12	100.18
" 211"	97MOB0166	ilmenite	0.13	0.07	0.02	0.04	0.02	51.25	0.47	0.03	2.26	46.62	0.04	0.06	0.00	0.05	0.12	101.18
" 3-218"	98MOB0008	ilmenite	0.05	0.13	0.11	0.00	0.00	52.31	0.21	0.00	2.01	45.11	0.00	0.00	0.05	0.14	0.00	100.12
" 219"	**98MOB0008**	**Mg-ilmenite**	9.47	0.38	0.04	0.00	0.03	51.61	0.45	0.41	0.24	36.89	0.11	0.11	0.10	0.21	0.11	100.16
" 3-233"	98MOB0011	ilmenite	0.10	0.01	0.03	0.05	0.03	52.27	0.13	0.01	1.32	46.16	0.05	0.05	0.05	0.01	0.16	100.44
" 3-238"	98MOB0024	ilmenite	0.06	0.03	0.07	0.00	0.01	51.44	0.15	0.05	1.91	45.96	0.01	0.06	0.20	0.06	0.08	100.08
" 239"	98MOB0024	ilmenite	0.06	0.00	0.01	0.00	0.02	50.79	0.22	0.01	1.90	47.55	0.05	0.02	0.02	0.10	0.00	100.74
" 240"	98MOB0024	ilmenite	0.30	0.01	0.02	0.00	0.03	51.18	0.25	0.11	1.12	47.14	0.15	0.10	0.09	0.07	0.13	100.71
" 241"	98MOB0024	ilmenite	0.13	0.02	0.04	0.07	0.00	50.41	0.21	0.09	2.69	46.70	0.00	0.04	0.06	0.08	0.08	100.63
" 3-262"	98MOB0061	ilmenite	0.20	0.08	0.02	0.03	0.00	51.39	0.18	0.05	1.89	46.12	0.02	0.00	0.03	0.00	0.12	100.12
" 263"	98MOB0061	ilmenite	0.15	0.05	0.02	0.00	0.02	50.06	0.28	0.00	0.92	47.79	0.05	0.04	0.00	0.15	0.12	99.66
" 264"	98MOB0061	ilmenite	0.09	0.04	0.00	0.06	0.00	50.62	0.31	0.00	1.63	46.82	0.06	0.03	0.00	0.08	0.04	99.79
" 265"	**98MOB0061**	**Mg-ilmenite**	7.24	0.12	0.00	0.00	0.00	48.52	0.40	1.70	0.38	41.00	0.03	0.08	0.01	0.04	0.00	99.52
" 266"	98MOB0061	ilmenite	0.14	0.08	0.00	0.00	0.02	50.47	0.10	0.00	2.10	47.47	0.00	0.02	0.00	0.03	0.00	100.42
" 3-271"	**98MOB0072**	**Mg-ilmenite**	10.97	0.49	0.03	0.00	0.01	51.82	0.46	2.43	0.31	32.44	0.04	0.10	0.10	0.24	0.00	99.42
" 272"	98MOB0072	ilmenite	0.12	0.04	0.09	0.00	0.01	49.57	0.51	0.01	1.34	48.55	0.14	0.01	0.08	0.00	0.04	100.51
" 3-290"	98MOB0074	ilmenite	0.10	0.03	0.03	0.02	0.00	52.62	0.12	0.00	0.66	46.90	0.07	0.04	0.00	0.00	0.01	100.60
" 3-295"	98MOB0075	ilmenite	0.02	0.08	0.03	0.00	0.02	50.78	0.25	0.04	0.76	48.23	0.04	0.07	0.06	0.10	0.07	100.55
" 296"	98MOB0075	ilmenite	0.54	0.08	0.04	0.00	0.01	51.63	0.24	0.03	1.57	46.63	0.03	0.02	0.07	0.06	0.09	101.04
" 297"	98MOB0075	ilmenite	0.32	0.10	0.05	0.02	0.00	53.50	0.05	0.00	1.72	45.20	0.09	0.00	0.10	0.18	0.00	101.32
" 298"	98MOB0075	ilmenite	0.36	0.08	0.00	0.04	0.01	53.09	0.16	0.08	1.06	45.67	0.03	0.00	0.07	0.02	0.00	100.66
" 3-313"	98MOB0099	ilmenite	0.11	0.02	0.01	0.04	0.01	53.78	0.27	0.03	3.23	43.25	0.09	0.00	0.00	0.03	0.15	101.01
" 314"	98MOB0099	ilmenite	0.34	0.02	0.05	0.04	0.04	53.01	0.29	0.00	1.15	45.62	0.11	0.06	0.00	0.06	0.05	100.84
" 3-322"	98MOB0129	ilmenite	0.18	0.05	0.04	0.09	0.02	53.04	0.18	0.00	1.59	45.56	0.03	0.08	0.01	0.12	0.00	101.00

Appendix E.2
Mineral chemistry for all picked grains
OXIDES

Grain	Sample ID	Mineral	MgO	Al2O3	SiO2	SO3	CaO	TiO2	V2O3	Cr2O3	MnO	FeO	CoO	NiO	ZnO	As2O3	Nb2O5	TOTAL
" 323"	98MOB0129	rutile, anatase	0.47	1.10	1.14	0.00	0.03	99.47	0.45	0.06	7.01	81.41	0.12	0.00	0.00	0.03	0.00	191.28
" 3-330"	**98MOB0150**	**Cr-spinel**	13.39	14.88	0.16	0.00	0.00	0.50	0.25	53.61	0.34	16.24	0.07	0.18	0.04	0.17	0.00	99.84
" 3-333"	98MOB0157	ilmenite	0.22	0.05	0.02	0.00	0.04	49.59	0.36	0.01	1.77	47.43	0.00	0.00	0.11	0.07	0.27	99.94
" 3-336"	98MOB0176	rutile, anatase	0.00	0.14	0.00	0.00	0.01	97.26	0.42	0.04	0.00	1.20	0.00	0.04	0.00	0.07	1.86	101.05
" 337"	98MOB0176	ilmenite	0.13	0.10	0.02	0.00	0.00	49.69	0.33	0.07	1.24	48.16	0.07	0.01	0.00	0.00	0.00	99.83
" 3-341"	98MOB0178	ilmenite	0.31	0.04	0.00	0.08	0.00	50.72	0.33	0.07	0.72	47.52	0.05	0.08	0.01	0.06	0.14	100.13
" 3-346"	98MOB0188	ilmenite	0.12	0.01	0.00	0.07	0.00	52.44	0.18	0.05	1.28	46.43	0.04	0.03	0.03	0.11	0.05	100.84
" 3-349"	98MOB0190	ilmenite	0.02	0.12	0.04	0.09	0.00	49.67	0.34	0.00	1.40	48.23	0.11	0.00	0.00	0.13	0.00	100.16
" 350"	98MOB0190	ilmenite	0.14	0.04	0.00	0.00	0.03	52.68	0.35	0.11	0.18	46.79	0.14	0.07	0.03	0.04	0.00	100.60
" 3-356"	98MOB0205	ilmenite	0.20	0.06	0.02	0.06	0.02	49.91	0.28	0.05	0.70	48.98	0.11	0.00	0.04	0.00	0.08	100.53
" 357"	98MOB0213	ilmenite	0.06	0.01	0.02	0.03	0.02	50.13	0.17	0.05	0.85	48.85	0.00	0.02	0.01	0.13	0.00	100.34
MacQuoid Lake samples (0.25-0.5mm):																		
" 98HJB-1"	98HJB0003	ilmenite	0.32	0.08	0.03	0.00	0.01	48.68	0.22	0.04	0.43	48.15	0.07	0.05	0.00	0.00	0.00	98.09
" 98HJB-5"	98HJB0003	ilmenite	0.29	0.04	0.04	0.00	0.00	52.20	0.19	0.00	1.91	44.59	0.04	0.00	0.00	0.00	0.00	99.30
" 98HJB-8"	98HJB0004	ilmenite	0.35	0.10	0.03	0.08	0.00	52.27	0.19	0.09	3.27	43.23	0.03	0.06	0.03	0.00	0.12	99.76
"98HJB-16"	98HJB0030	rutile, anatase	0.02	0.11	0.02	0.03	0.03	96.80	0.42	0.10	0.01	1.19	0.02	0.05	0.00	0.06	0.00	98.84
" 17"	98HJB0037	ilmenite	0.54	0.05	0.03	0.00	0.00	49.18	0.30	0.04	0.33	49.07	0.08	0.06	0.06	0.00	0.00	99.74