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Chemistry and Mineralogy of Kimberlite-Indicator Mineral Grains from a Till Survey of the Sawn Lake Area (NTS 84B/13), Southern Buffalo Head Hills, Alberta

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Chemistry and Mineralogy of Kimberlite-Indicator Mineral Grains from a Till Survey of the Sawn Lake Area (NTS 84B/13), Southern Buffalo Head Hills, Alberta

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Acknowledgments

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Abstract

The Sawn Lake map area (NTS 84B/13) covers the northwest part of the Buffalo Head Hills kimberlite field, within which 38 kimberlites have been discovered since 1997. In the summer of 2002, 55 till samples (with an average weight of 29 kg) were collected within the Sawn Lake map area, representing an average density of approximately one sample per 16 km^2. Heavy mineral concentrates were prepared and picked for kimberlite-indicator minerals, including pyrope, eclogitic garnet, Cr-diopside, olivine, picroilmenite and chromite. Results based upon the picked grain counts, including a map showing the distribution of kimberlite-indicator mineral grains, are presented in Prior et al. (2005).

This report presents the results of 476 microprobe analyses (including three duplicate analyses) of 473 grains from the Sawn Lake map area: 427 grains from near-surface till samples; 15 grains from a subtill glaciofluvial sample collected near the K4 kimberlite complex; 10 grains from an auger-core till sample collected near the K4 kimberlite complex; 20 grains from a mantle xenolith from the K6 kimberlite; and one grain from a duplicate field sample. The microprobe data include 176 garnet, 66 chromian diopside/augite, 29 edenite/pargasite, 108 forsterite and 73 chromite analyses. The garnet data include results for 147 G9 and nine G3 (eclogitic) garnets.

1 Introduction

1.1 Overview

The Sawn Lake map area (NTS 84B/13) covers the northwest part of the Buffalo Head Hills kimberlite field, within which 38 kimberlites have been discovered since 1997. Approximately two-thirds of these kimberlites contain diamonds with estimated grades of up to 55 carats per hundred tonnes (Hood and McCandless, 2004). Nineteen (50%) of the known kimberlites within the Buffalo Head Hills kimberlite field occur within the Sawn Lake map area (Hood and McCandless, 2004). The impetus for the kimberlite-indicator mineral (KIM) till survey by the Alberta Geological Survey was to

1) collect information on KIM dispersal within a known kimberlite field to help diamond explorers optimize exploration programs elsewhere in northern Alberta;
2) assess the effectiveness of regional till KIM surveys compared to regional stream sediment KIM surveys; and
3) provide information that might lead to the discovery of additional diamondiferous kimberlites in the Sawn Lake area.

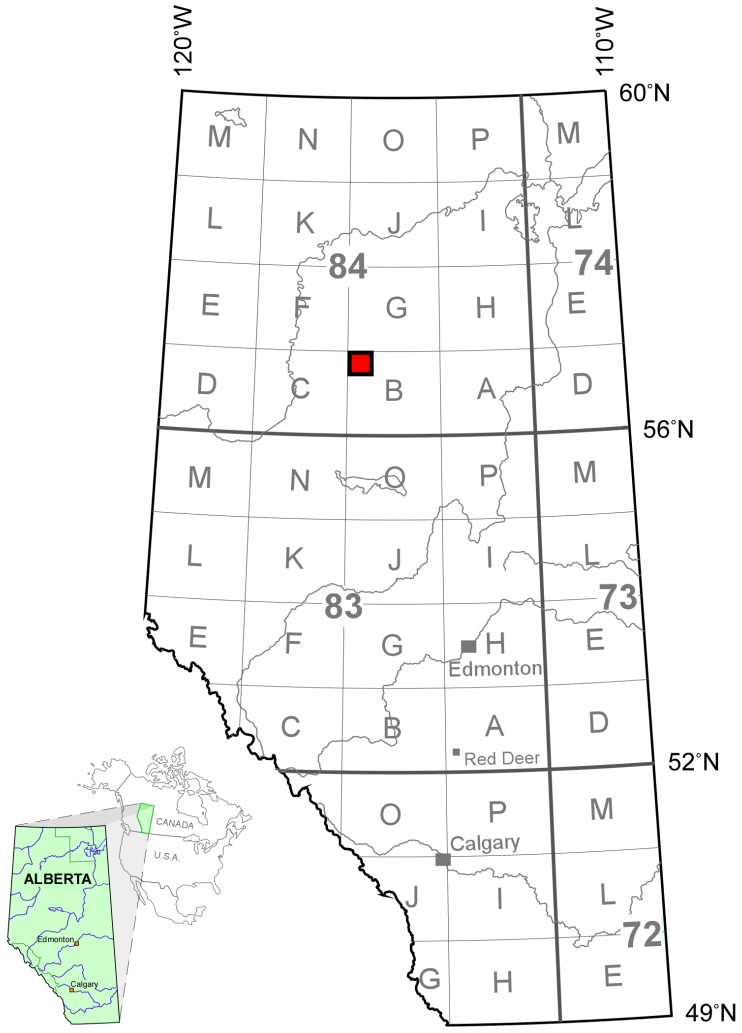

Figure 1. Location of the Sawn Lake (NTS 84B/13) map area.

During the 2002 till sampling program, 55 till samples and one subtill glaciofluvial sample were collected within the Sawn Lake map area, representing an average density of approximately one sample per 16 km^2. Heavy-mineral concentrates were prepared and picked for kimberlite-indicator minerals, including pyrope, eclogitic garnet, Cr-diopside, olivine, picroilmenite and chromite. Data for epidote, spinel, apatite, tourmaline, chlorite, rutile, monazite, sulphide and Cr-amphibole were also obtained. In addition, one sample of a mantle xenolith (lherzolite) from the K6 kimberlite, exposed at surface in stripped area near the K6 kimberlite outcrop, was collected. This report releases microprobe analyses of grains picked from the till, sand and xenolith samples.

Information on the spatial distribution of KIM grains in till relative to known kimberlites in the Sawn Lake area, including a map showing the distribution of picked pyrope, Cr-diopside, olivine and chromite grains, is reported in Prior et al. (2005). Some aspects of the project described in this report have also been presented in Prior et al. (2003a; 2003b). In addition, Keith (2004) studied Cr-rich amphiboles obtained from the till samples collected in 2002.

1.2 Location and Physiography

The Buffalo Head Hills of north-central Alberta form a northerly trending upland region lying between the Peace River Lowland (Cadotte Plain) to the west and the Wabasca Lowland (Loon Lake Plain) to the east (Pettapiece, 1986). The Sawn Lake map area (NTS 84B/13) lies within the southern Buffalo Head Hills, approximately 50 km northwest of the Red Earth Creek community. In general, the western two-thirds of the survey area are characterized by a relatively flat upland with hummocky terrain dissected by meltwater channels. The eastern one-third of the survey area lies on the gently east-sloping flanks of the Buffalo Head Hills. The area has a maximum elevation of 820 metres above mean sea level, almost 300 metres above the Wabasca Lowland to the east. Oil and gas production occurs in the region and some areas of the forest have been logged.

2 Geology

2.1 Bedrock Geology

2.1.1 Sedimentary Rocks

The Buffalo Head Hills are underlain by Cretaceous strata of the Western Canada Sedimentary Basin (Figure 2). The area near Sawn Lake is shown on maps by Green et al. (1970) and Hamilton et al. (1999) to be underlain by dark grey shale and silty shale of the Upper Cretaceous Smoky Group. However, recent palynological results indicate the uppermost part of the Buffalo Head Hills in the Sawn Lake area is underlain by Upper Campanian rocks, including sandstone, correlative to the Wapiti Formation (Pawlowicz et al. 2005a, 2005b; Figure 3). Stratigraphic markers in the lower part of the Upper Cretaceous succession indicate nearly horizontal dips in the Sawn Lake area (Chen and Olson, 2005).

2.1.2 Kimberlites

The Buffalo Head Hills kimberlite field, which occurs within the southern Buffalo Head Hills and the adjacent Loon Lake Plain (Loon River lowland) to the east (Figure 2), contains a minimum of 38 occurrences of kimberlite (Hood and McCandless, 2004). These kimberlites are hosted by a Cretaceous succession composed dominantly of marine shales of the Shaftesbury Formation and Smoky Group, which are separated by deltaic to marine sandstones of the Dunvegan Formation (Green et al., 1970; Hamilton et al., 1999). Some kimberlite pipes of the Buffalo Head Hills field are quite large, up to 40 hectares, based upon drillhole information and geophysical modelling (Skelton et al., 2003). Three kimberlites are exposed at surface and several of the kimberlites form bedrock highs, which may be

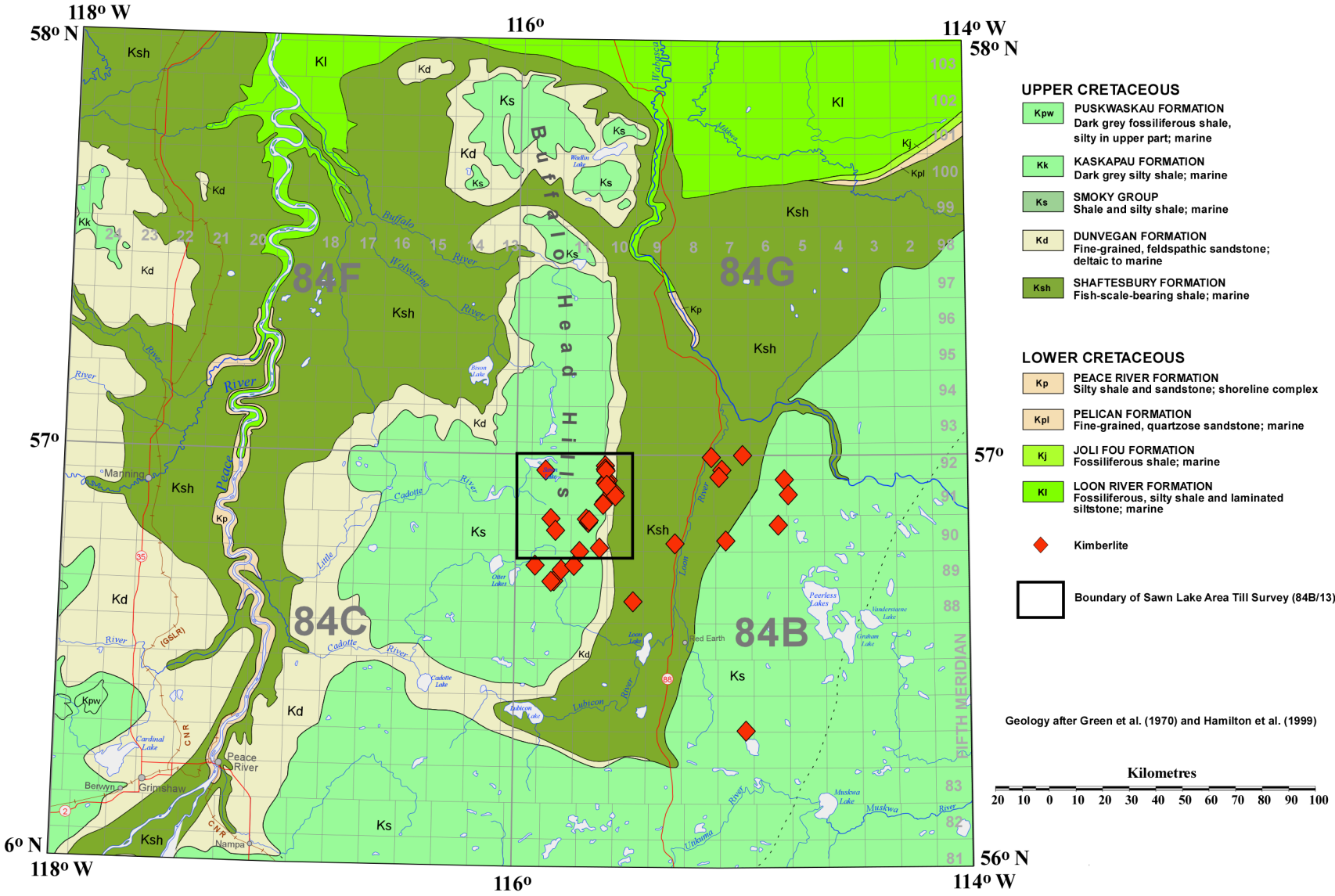

Figure 2. Bedrock geology of the Buffalo Head Hills area (NTS 84B, C, F and G).

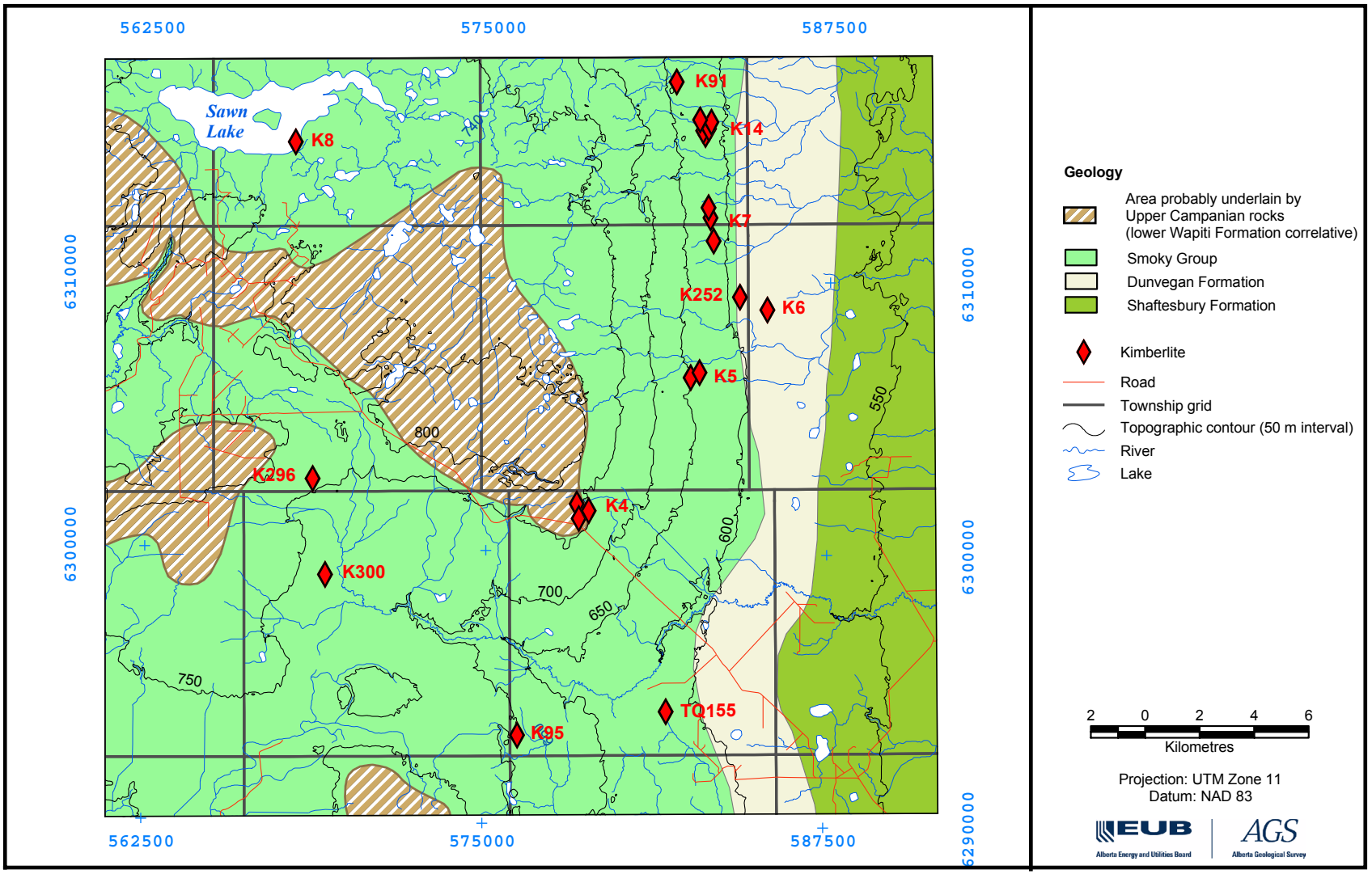

Figure 3. Geology of the Sawn Lake map area (NTS 84B/13), southern Buffalo Head Hills (from Pawlowicz et al., 2005a).

accompanied by topographic highs, due to their greater resistance to weathering and glacial erosion relative to the poorly indurated Cretaceous sedimentary rocks. In general, kimberlites of the Buffalo Head Hills field consist primarily of crater facies, juvenile lapilli-rich, olivine (crystal) tuffs (Boyer et al., 2003; Eccles, 2004). Perovskite (U-Pb) dates obtained on three Buffalo Head Hills kimberlites indicate emplacement ages of 86±3, 87±3 and 88±5 Ma for kimberlites K7A, K5 and K14, respectively (Carlson et al., 1999).

Xenocrystic mineral assemblages from kimberlites within the Buffalo Head Hills field have been reported on by Hood and McCandless (2003; 2004):

> "Indicator mineral assemblages have been assessed for twenty-nine of the Buffalo Hills kimberlites, with forsteritic olivine forming the dominant xenocryst or cryptogenic mineral species. Chromian pyrope garnet and chromite are also important constituents, although some pipes (e.g., K8, K7B, K7C and BM3) are devoid of these minerals. Eclogitic pyrope-almandine, titanian pyrope, chromian augite/diopside and picroilmenite are also present in lesser amounts, and some bodies contain chromian corundum, zircon, edenitic amphibole and Mg-Cr-Al spinel" (Hood and McCandless, 2003, p.1). "Xenocryst occurrence varies widely between bodies and appears uncorrelated with geographic location, pipe morphology or diamond content." (Hood and McCandless, 2004, p. 735).

Of the 38 kimberlites within the Buffalo Head Hills field, 26 are known to contain diamonds. Kimberlites in the northern part of this field tend to have higher diamond content. The northern group of kimberlites includes K252, which has the highest known diamond content with an estimated grade of 55 carats per hundred tonnes (Hood and McCandless, 2004).

2.2 Surficial Geology

2.2.1 Surficial Materials

The surficial geology of the southeastern Buffalo Head Hills (NTS 84B/NW), which includes the Sawn Lake (NTS 84B/13) area, has been mapped at 1:100 000 scale (Paulen et al., 2003). Subsequent detailed 1:50 000 mapping of the Sawn Lake area (Trommelen, 2004; Trommelen et al., 2006) provides excellent detail on the distribution of surficial sediments within the study area. The present surficial geology in the region is largely the result of the advance and retreat of the Late Wisconsin Laurentide Ice Sheet (Lostwood Glaciation; Fenton, 1984). Drift thickness ranges from thin (<1 m) veneers, with rare bedrock exposures, to over 60 m across the map area (Pawlowicz and Fenton, 2005).

Much of the Sawn Lake area is covered by moraine (till), of which there are two dominant types:

4) Basal Till: Basal till occurs at the surface along the flanks of the Buffalo Head Hills and in the Wabasca Lowland. The till is characterized by non-sorted diamicton with a silty clay matrix that is commonly fissile and compact, and contains 1%–5% clasts ranging from granules to rare boulders. Topographically, the deposits form flat, low-relief plains. This material is interpreted as till deposited directly by glacial ice without transport or modification by water. Due to the silty clay texture of the tills, and generally low topographic gradient, water tables are often perched and the moraine plains host numerous Holocene fens and peat bogs (Trommelen, 2004; Paulen et al., 2006).

5) Ablation Till (stagnant ice moraine): A considerable region of hummocky terrain, with circular or "doughnut" morphology, occurs on the uplands of the Buffalo Head Hills. The material consists of non-sorted diamicton with a matrix ranging from sandy-silt to silty-clay. The matrix is typically poorly compacted and local sand lenses (medium to coarse-grained) are common. The diamicton contains 5%–10% clasts, which are more angular and less polished than the faceted clasts of basal

till. The ablation till may be weakly stratified, likely due to the greater presence of water during deposition. Topographically, the stagnant ice moraine is typified by undulating to hummocky terrain consisting of roughly equidimensional hills and depressions. Relief is often greater than two metres, which creates a landscape significantly different from areas covered by basal till. Stagnant ice moraine is thought to represent glacial sedimentation during ice stagnation and retreat. It represents a combination of till, and glaciofluvial and glaciolacustrine material. The stagnant ice moraine often forms doughnuts consisting of a roughly circular hill composed of till with a central depression in-filled with lacustrine sediments and subsequent bog peat (Trommelen, 2004; Paulen et al., 2006).

Glaciofluvial valley systems, extending for up to 20 km in length, are found throughout the survey area. These valleys, up to 300 m wide and 50 m deep, have significant negative topographic relief on the landscape that exceeds the local relief of hummocky topography. Channels formed by ice-marginal meltwater flow tend to be aligned perpendicular to the topographic gradient (slope) and define retreating ice margins, whereas the proglacial channels flow along topographic gradients and are associated with sorted glaciofluvial outwash deposits. Ice-contact sediment occurs in the form of small kames (up to 0.5 km across), eskers (averaging 1 km in length) and small crevasse fill deposits. These ice-contact deposits consist of poorly sorted, massive to crudely stratified gravel, sand and minor silt. Glaciolacustrine sediments are rare in the Sawn Lake region but can be found in the nearby Loon Lake Plain (Paulen et al., 2003). Colluvium, in the form of slumped deposits, generally occurs as a veneer along several of the main valleys in the study area. Modern fluvial sediment is dominantly fine-grained with organic detritus and minor gravel and sand in more developed streams. Organic deposits are found throughout the map region in areas of poor surface drainage, such as moraine plains, and in depressions within stagnant ice moraine (Trommelen 2004; Paulen et al., 2006).

2.2.2 Late Wisconsin Glacial History

A reconstruction of Late Wisconsin ice flow in northern Alberta is shown in Figure 4. Glacial advances in northern Alberta originated from the Laurentide Ice Sheet, which generally flowed across central Alberta in a southwest direction (Fulton, 1989; Fenton et al., 2003). According to regional studies, ice advanced to its maximum Late Wisconsin limit approximately 23 to 24 thousand years ago before present (ka) and retreated from the Buffalo Head Hills by 11 ka (^{14}C; Dyke et al., 2002, 2003; Dyke, 2004). Local evidence for the southwesterly flow of the Late Wisconsin Laurentide Ice Sheet across the Sawn Lake area during glacial maximum includes

- a sculpted crag and tail feature at the K5 kimberlite outcrop (Skelton et al., 2003; Paulen et al., 2003);
- poorly developed flutings, trending west-southwest, formed in the upper part of the Buffalo Head Hills in a local area where the drift forms only a thin (<2 m) veneer over the Cretaceous mudstone (Paulen et al., 2003); and
- striae on a polished surface of the K6 kimberlite outcrop indicating south-southwest glacial flow (Paulen and McClenaghan, in press).

Recession of the western margin of the Laurentide Ice Sheet began around 14 ka (^{14}C; Dyke, 2004). Saint-Onge (1972) indicates that drainage of the Lesser Slave Lake valley occurred about 11 000 years ago, based on a bulk gyttja date of 11 400±190 years before present (^{14}C; GSC-1049; Lowdon et al., 1971). Recently, precision ^{14}C Accelerator Mass Spectrometry (AMS) dates on seeds and wood obtained from the base of lake cores in the Utikuma Lake area support this minimum deglacial age (Squires et al., 2006). During glacial retreat, the ice margin retreated down-drainage, essentially ponding all meltwater in proglacial lakes and trapping the terrestrial and meltwater drainage from the recently deglaciated eastern Cordillera and foothills (cf. Mathews, 1980). This created an unstable ice margin. Surging ice lobes advanced and retreated within the proglacial lakes, modifying or obliterating older streamlined

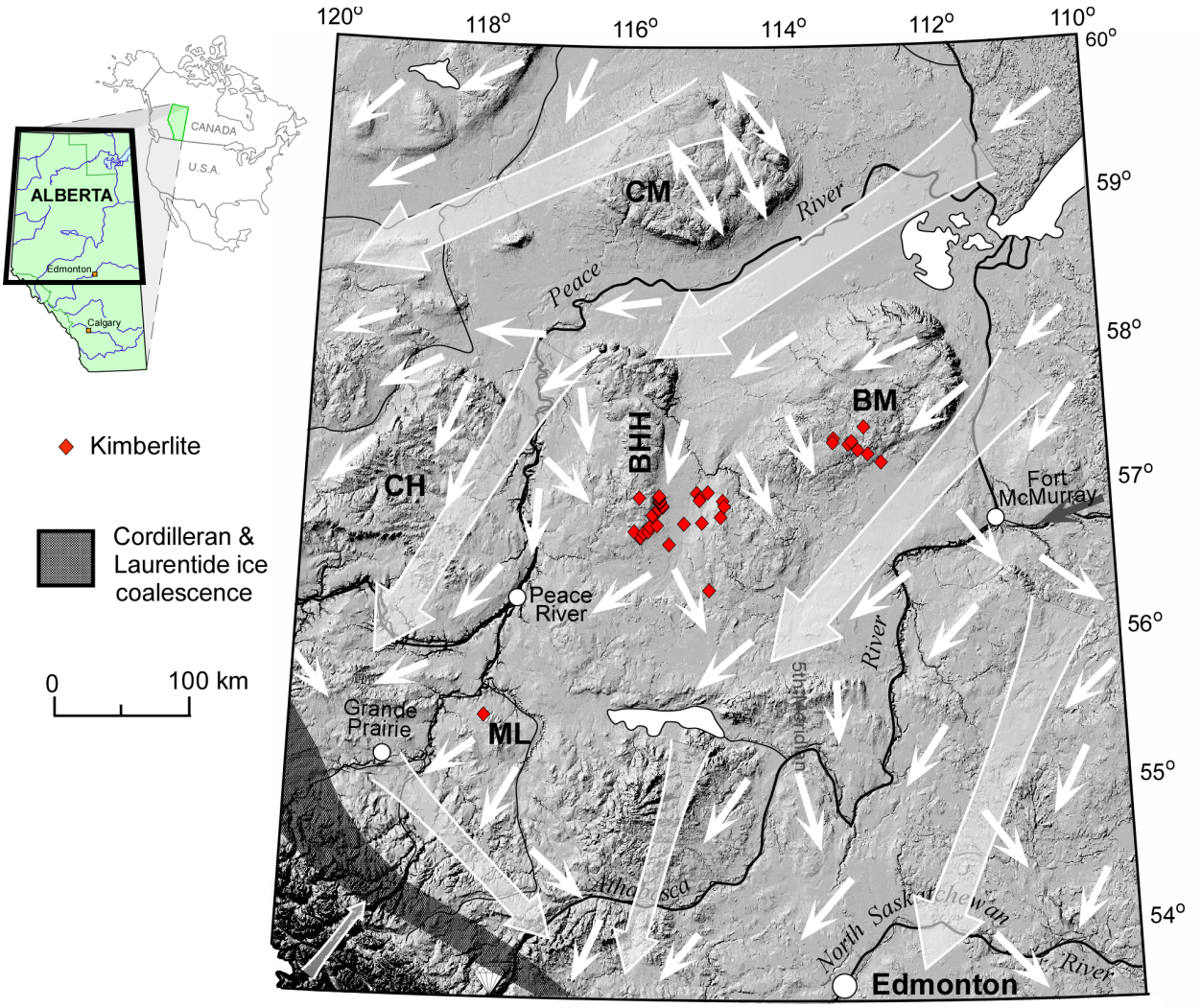

Figure 4. Flow of the Laurentide Ice Sheet during the Late Wisconsin.

landforms and creating strongly fluted terrain in the lowlands. Ice was often confined by topography and deglacial streamlined landforms commonly deviate considerably from glacial maximum flow directions. Sometime after glacial maximum, southwardly flowing ice (Peace River lobe) in the northern Peace River valley advanced out of the Peace River valley from the northwest and flowed over the southwestern flank of the Buffalo Head Hills (Mathews, 1980; Paulen and McClenaghan, in press). This southeasterly surge was deflected by a large mass of surging ice that was flowing south-southwest along the Loon River valley. Thinner ice likely stagnated on top of the Buffalo Head Hills while thicker ice in the valleys continued to actively flow in their proglacial lake settings (Paulen and McClenaghan, in press).

3 Field Methods and Samples

3.1 Sample Distribution

During the 2002 sampling program, till samples were collected from 55 sites representing an overall average density of approximately one sample per 16 km^2 (Figure 5). In addition to the till samples, one sand-rich sample (2022M) of glaciofluvial (ice-advance proglacial outwash) material was collected beneath 2 m of till.

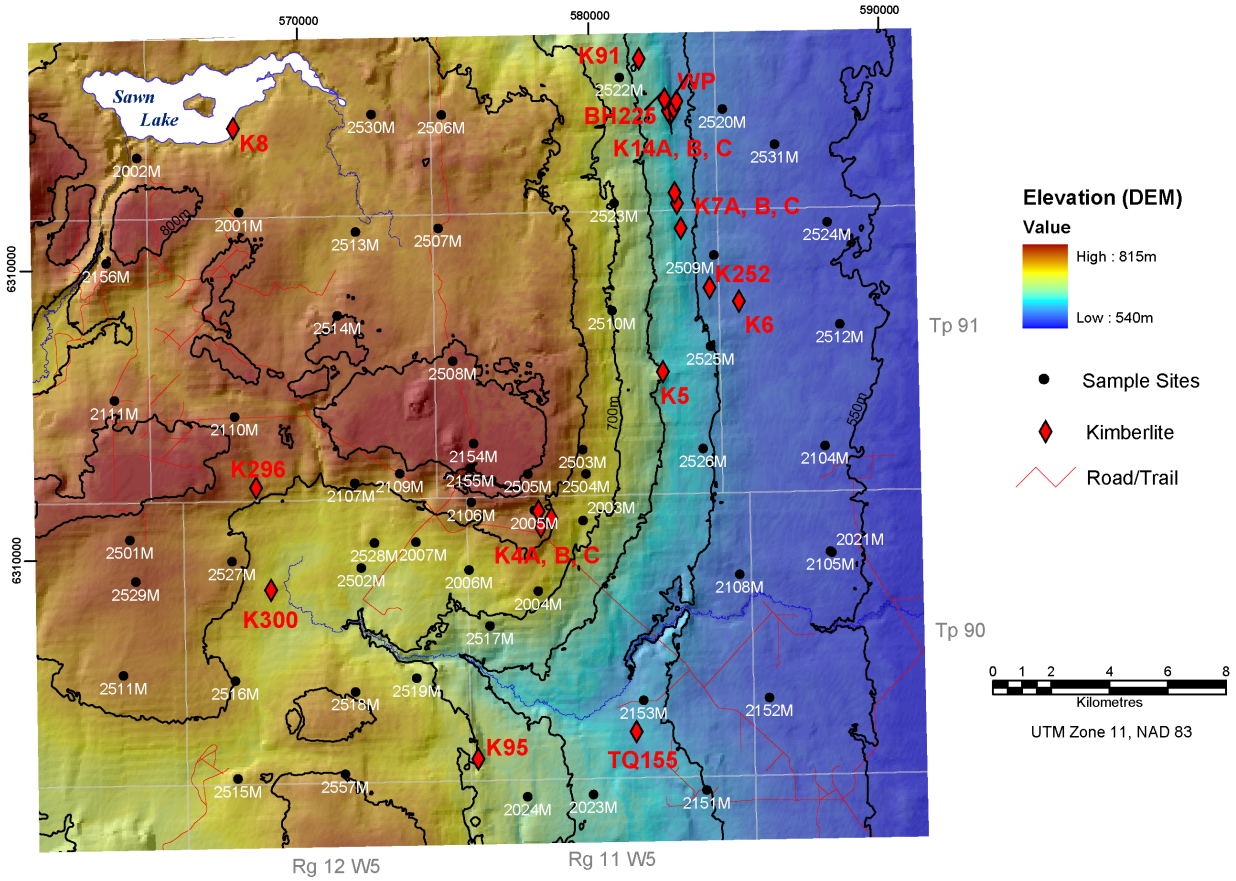

Figure 5. Sawn Lake (NTS 84B/13) till survey, southern Buffalo Head Hills, Alberta: 2002 sample sites.

3.2 Sample Collection

Travel to sites in 2002 was accomplished using trucks, 4-wheel all-terrain vehicles, foot traverses and helicopter (one site). Access to field sites away from roads was commonly along seismic lines. At each sample site (if no road cut existed) a pit was dug, generally to a depth at which the till matrix contained calcite, as determined by reaction with dilute (10%) HCl. This commonly occurs at a depth of 10 to 30 cm below the first appearance of limestone clasts, which have undergone in situ weathering. The till kimberlite-indicator mineral sample was then collected from the bottom of the pit over a 20 to 30 cm interval. Sampling depth intervals typically varied from as shallow as 55 to 75 cm to as deep as 130 to 150 cm. The KIM till sample was added to a labelled 23-litre (5-gallon) plastic pail until the pail was nearly full. The weight of the KIM samples delivered to the lab for processing generally varied from 25 to 35 kg. In addition to the KIM sample, a 1 to 2 kg till sample was collected from near the bottom of the pit and placed in a labelled plastic bag for geochemical analyses of the <63 micron fraction. Each pair of KIM and associated geochemical samples were assigned the same four numbers with a suffix of M for the KIM (mineralogy) sample and a suffix of G for the geochemical sample (e.g., 2001M and 2001G). Once sampling was completed, the pit was filled in. One pair of glaciofluvial sand samples (2022M and 2022G) were collected during the 2002 program in a manner similar to that described for the till samples. Sample descriptions are provided in Prior et al. (2005).

4 Analytical Methods and Results

4.1 Heavy Mineral Concentration and Grain Picking

Heavy mineral concentration and grain-picking methods, along with a discussion of quality control results, are described in Prior et al. (2005).

4.2 Microprobe Analyses

The microprobe analyses presented in this report were performed by SGS-Lakefield Research Limited of Lakefield, Ontario: "Selected mineral grains were mounted in 1" diameter epoxy plugs, polished and carbon coated to facilitate electron microprobe analysis. Electron microprobe analysis was performed with a JEOL 733 Superprobe operating at 15 KeV and 20 nA operating current. Standardisation was completed with natural and synthetic materials sourced from the Smithsonian Institute" (Jago, 2004). The measuring time for each analyzed element was 20 seconds (Jago, 2004). The microprobe beam was 1.0 to 1.5 microns in diameter (O. Valeyev, personal communication, 2006).

4.3 Analytical Results

A summary of microprobe analytical results for heavy mineral grains picked from the 2002 samples is presented in Appendix 1.

5 Chemistry and Mineralogy

5.1 Data

A total of 4266 grains—visually identified as pyrope, eclogitic garnet, clinopyroxene (Cr-diopside), olivine, ilmenite or chromite—were picked from the 59 samples considered in this report (Appendix 2). Additional grains, including tourmaline, were also picked but are not listed in Appendix 2. Microprobe analyses are presented in Appendix 1 for 473 grains, including five grains picked as tourmaline (adding three duplicate analyses the total number of microprobe results reported is 476); 427 grains from 55 near-surface till samples; 15 grains from a glaciofluvial sample collected near the K4 kimberlite complex; 10 grains from an auger core till sample collected near the K4 kimberlite complex; 20 grains from a mantle xenolith from the K6 kimberlite; and one grain from a duplicate field sample. Considering only the 55 near-surface till survey samples (excluding duplicates), 3852 grains (visually identified as pyrope, eclogitic garnet, clinopyroxene (Cr-diopside), olivine, ilmenite or chromite) were picked from 55 samples. Of these 3852 grains, 422 (11%) were submitted for microprobe analyses.

Chemical data for grains from the K5, K6 and K14 kimberlites (outcrop and trench exposures), presented in Eccles et al. (2004), are used for comparative purposes in this report. The K4 kimberlite data listed in Eccles et al. (2004) are not used as they represents grains from surficial materials (till and glaciofluvial sand) near the K4 kimberlite (R. Eccles, personal communication, 2006).

5.2 Garnet

The Sawn Lake area till data set for samples collected in 2002 contains 176 garnet grains that have been confirmed by microprobe analyses (Appendix 1; Table 1). Initial chemical classification of the garnet grains is based upon molar ratios. Of the 154 grains picked as pyrope, 153 are chemically confirmed to be pyrope and 1 is an almandine. Of the 20 grains picked as eclogitic garnet, 11 are chemically identified as almandine and 9 are identified as pyrope. The two grossular garnets, identified by microprobe analyses, were both picked as clinopyroxene.

Table 1. Garnet mineralogy

Mineral (molar ratio classification)	Total Confirmed	Original Picked Grain Identification		
		Eclogitic Garnet	Pyrope	Clinopyroxene
Almandine	12	11	1	0
Pyrope	162	9	153	0
Grossular	2	0	0	2

The garnet grains are further subdivided into categories based upon the classification scheme of Grütter et al. (2004) for mantle-derived garnet (Table 2). Of the 12 almandine grains, 8 are classified as G3 garnets (eclogitic), 2 are classified as G4 garnets (eclogitic, pyroxenitic and websteritic) and 2 fall into the G0 (unclassified) category. Of the 162 pyrope grains, 147 are classified as G9 garnets (lherzolitic), 7 are classified as G12 garnets (wehrlitic), 5 are classified as G4 garnets (eclogitic, pyroxenitic and websteritic), 1 is classified as a G1 garnet (low-Cr megacryst), 1 is classified as a G11 garnet (high-Ti peridotitic) and 1 is classified as a G3 (eclogitic) garnet. The eclogitic garnets do not display significant Na enrichment.

Table 2. Garnet categories

Mineral	Garnet Category (After Grütter et al., 2004)								
	G1	G11	G10	G9	G12	G5	G4	G3	G0
Almandine	0	0	0	0	0	0	2	8	2
Pyrope	1	1	0	147	7	0	5	1	0
Total	1	1	0	147	7	0	7	9	2

Almandine and pyrope compositions are displayed in a MGNUM (molar Mg/(Mg+Fe)) versus TiO_2 diagram, after Grütter et al. (2004), in Figure 6. Most of the pyropes have MGNUM values near 0.8, whereas the almandine MGNUM values range between 0.24 and 0.45. Two of the pyropes fall just within the G1-G11 field. Kimberlite garnet compositions, from Eccles et al. (2004), are plotted in Figure 7. Most have MGNUM values near 0.8 and a significant proportion of the K6 and K14 garnets occupy the G1-G11 field.

The Sawn Lake regional survey pyrope and almandine data are displayed in a CaO versus Cr_2O_3 plot, after Grütter et al. (2004), in Figure 8. Most of the pyropes plot in the G9 (lherzolitic) garnet field (there are no G5 garnets in the data set). A small number of the pyropes plot in the G12 (wehrlitic), G3 (eclogitic) and G4 (eclogitic, pyroxenitic and websteritic) garnet fields. The almandines plot mainly in the G3 (eclogitic) garnet field with two grains in each of the G4 (eclogitic, pyroxenitic and websteritic) garnet and G0 (unclassified) garnet fields.

For comparative purposes, a second CaO vs. Cr_2O_3 plot, showing data for garnet grains from the K5, K6 and K14 kimberlites, is presented in Figure 9. Most of the data for kimberlite K14 plot within the G9 (lherzolitic) garnet field (none of the kimberlite grains are G5 garnets). The small amount of garnet data for the K5 and K6 kimberlites plots primarily in the G12 (wehrlitic) garnet field with most of the grains from K6 forming a tight group at approximately 10.5% Cr_2O_3. None of the K5, K6 and K14 grains satisfies the criteria of G3 or G4 garnets.

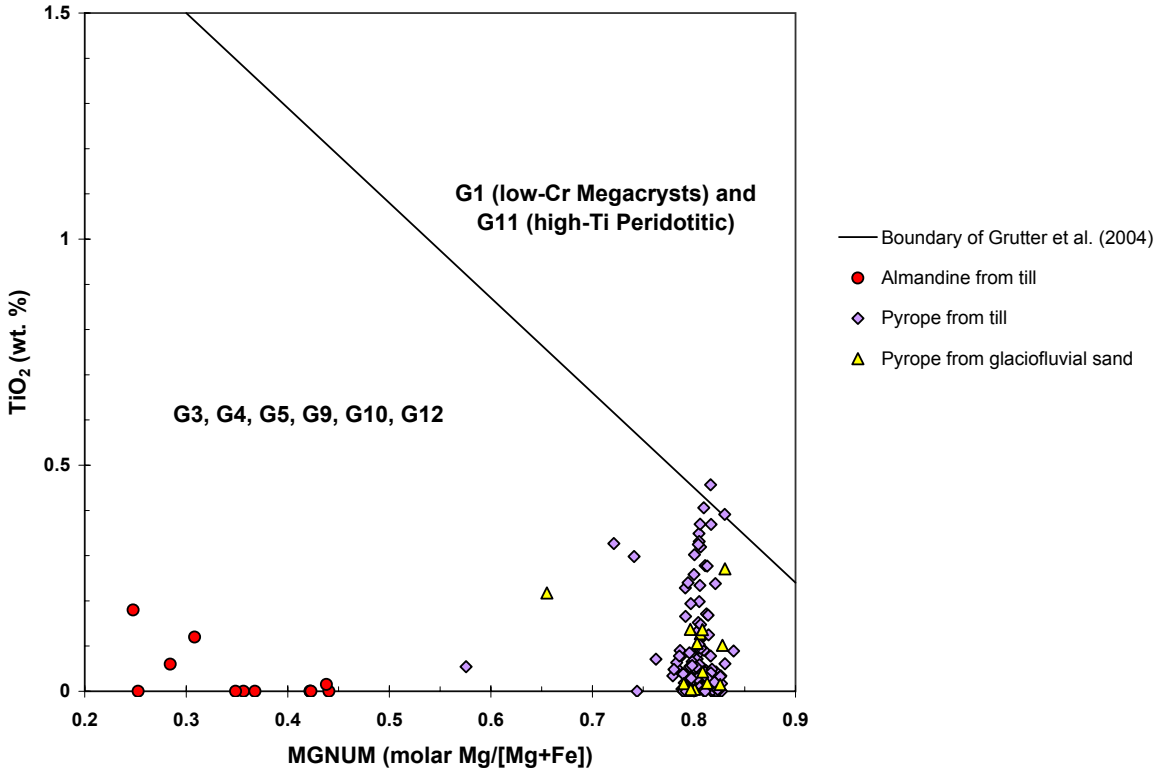

Figure 6. MGNUM (molar Mg/[Mg+Fe]) versus TiO_2 diagram, after Grütter et al. (2004), of almandine and pyrope grains from till and glaciofluvial sand collected in the Sawn Lake area.

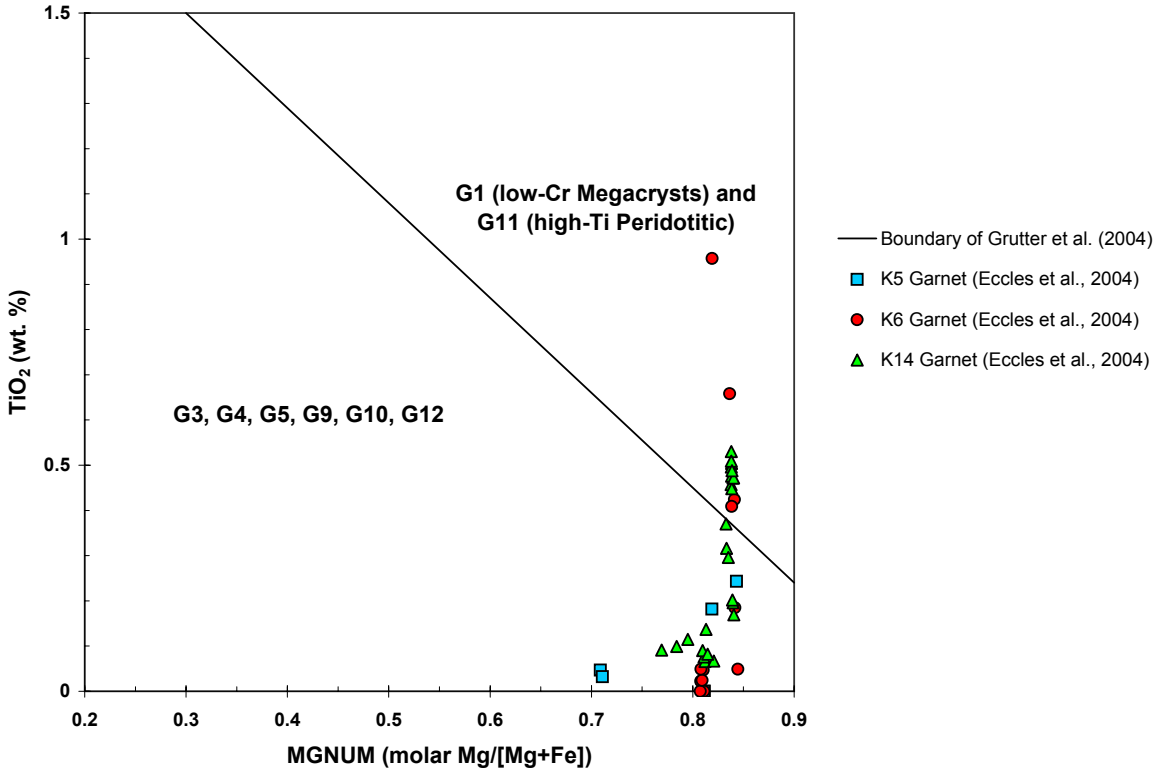

Figure 7. MGNUM (molar Mg/[Mg+Fe]) versus TiO_2 diagram, after Grütter et al. (2004), of garnet grains from kimberlites in the Sawn Lake area (data from Eccles et al., 2004).

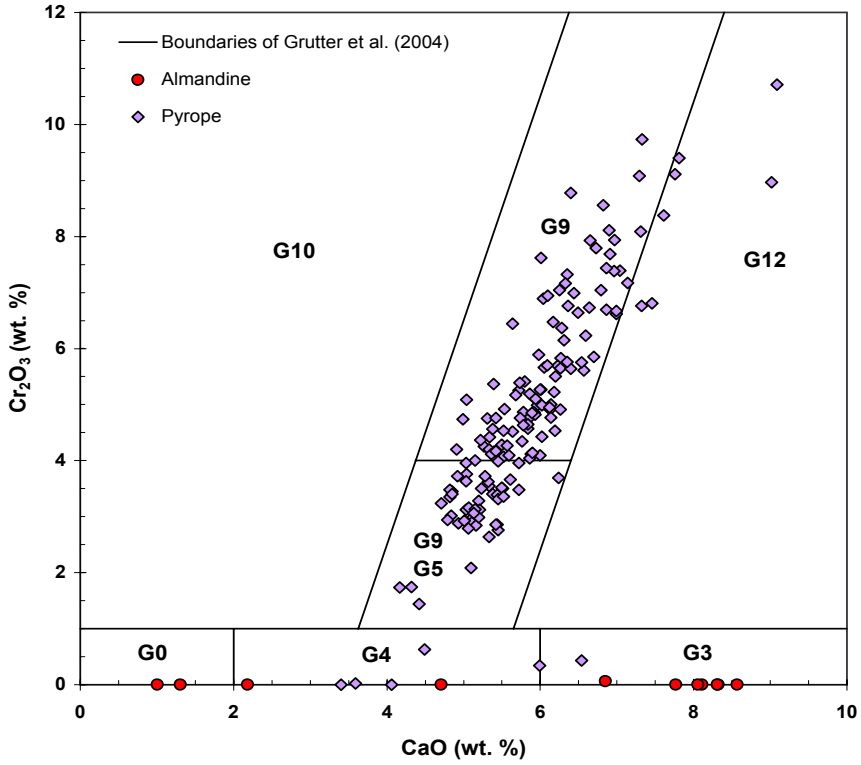

Figure 8. CaO versus Cr_2O_3 diagram, after Grütter et al. (2004), of almandine and pyrope grains from till and glaciofluvial sand samples collected in the Sawn Lake area.

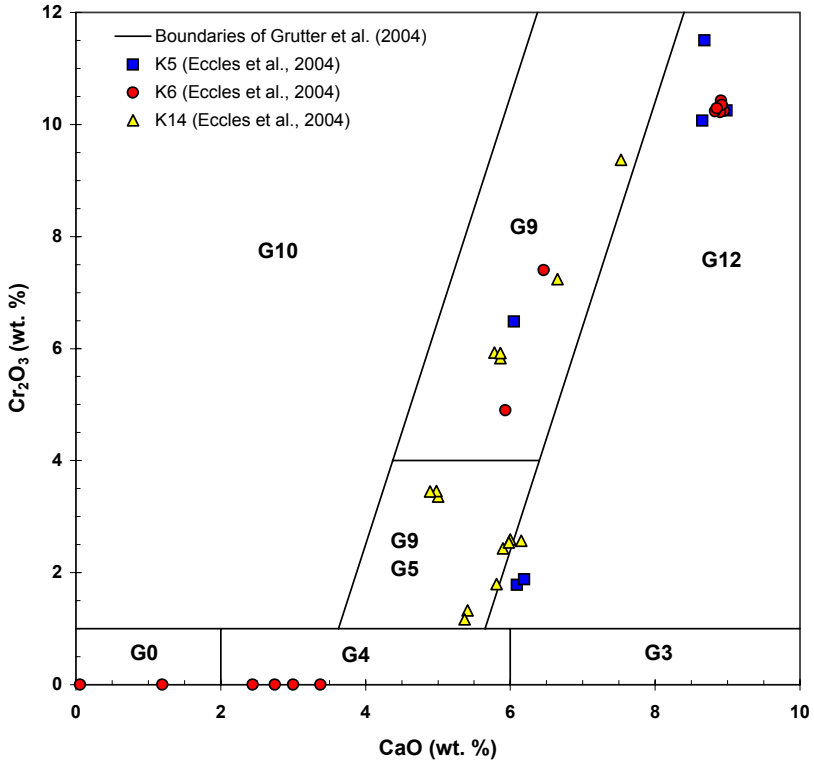

Figure 9. CaO versus Cr_2O_3 diagram, after Grütter et al. (2004), of garnet grains from kimberlites in the Sawn Lake area.

Pyrope data from the Sawn Lake map area survey are shown on a SiO_2 versus Al_2O_3 diagram in Figure 10. Pyrope from till sample 2530M, which is highlighted on the diagram, has an unusually high proportion of grains with elevated Al_2O_3/SiO_2 values. Sample 2530M is the most northerly sample from the 2002 Sawn Lake area till survey with a strongly elevated kimberlite-indicator mineral grain content and the source of these grains may remain to be discovered (Prior et al., 2005).

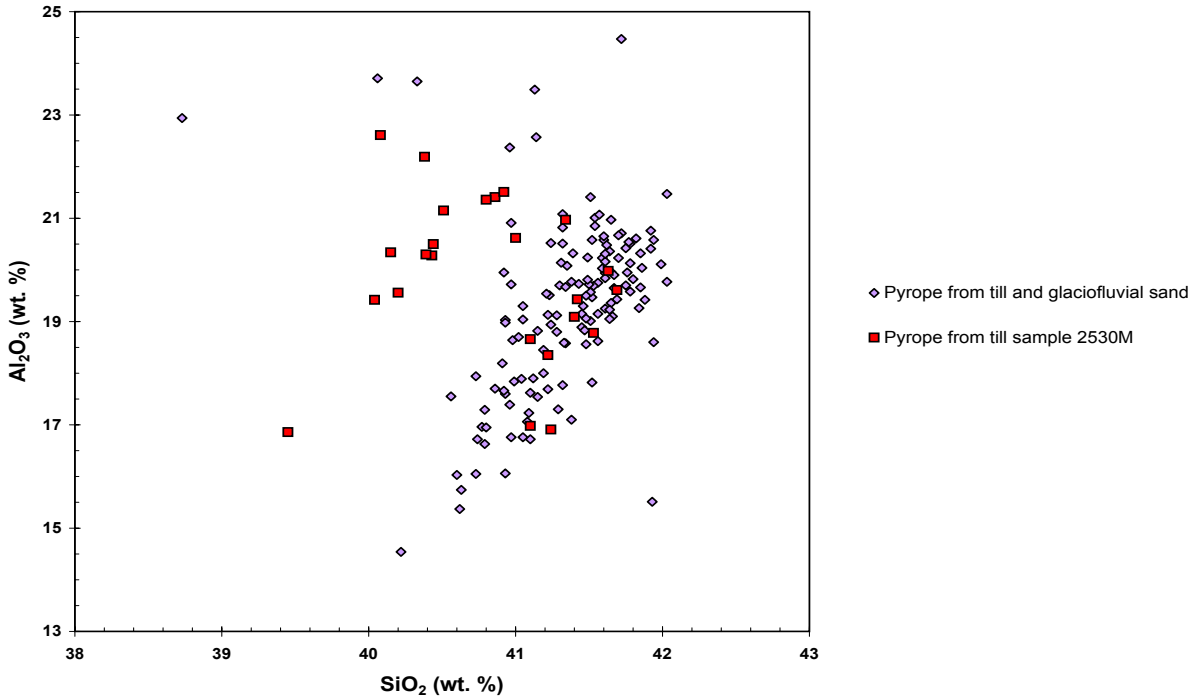

Figure 10. SiO_2 versus Al_2O_3 diagram of pyrope grains from till and glaciofluvial sand samples collected in the Sawn Lake area.

5.3 Clinopyroxene

Grains from the 2002 till sampling of map area 84B/13 include 76 microprobe confirmed clinopyroxenes: nine chromian augites, 59 chromian diopsides and 10 diopsides (Appendix 1; Table 3). Ten of these grains are from the K6 kimberlite mantle xenolith (2559M), two are from the glaciofluvial sand sample (2022M) and the remainder are from the regional till survey of the Sawn Lake map area. Following the pyroxene nomenclature recommendations of Morimoto (1989), the modifier chromian has been added to pyroxenes containing greater than 0.01 cations of Cr per formula unit (approximately 0.4 wt. % Cr_2O_3).

Table 3. Clinopyroxene mineralogy

Mineral (molar ratio classification)	Total Confirmed	Original Picked Grain Identification		
		Clinopyroxene[1]	Clinopyroxene or Amphibole	Olivine
Chromian Augite	9	9	0	0
Chromian Diopside	59	57	2	0
Diopside	10	6	0	4
[1]picking targeted Cr-rich clinopyroxene (+/- amphibole)				

On the Al_2O_3 versus Cr_2O_3 discrimination plot of Ramsay and Tompkins (1994), most of the chromian clinopyroxene from the regional till samples lie within the field of clinopyroxene from garnet peridotite (Figure 11). A minority of the till grains lie in the field of clinopyroxene from spinel lherzolite and 'off-craton' garnet peridotite indicative of equilibration at lower pressures. Nearly all of the clinopyroxene grains from kimberlites K5 and K6 (Eccles et al., 2004), and those from the K6 mantle xenolith (this study), lie within the field of clinopyroxene from garnet peridotite.

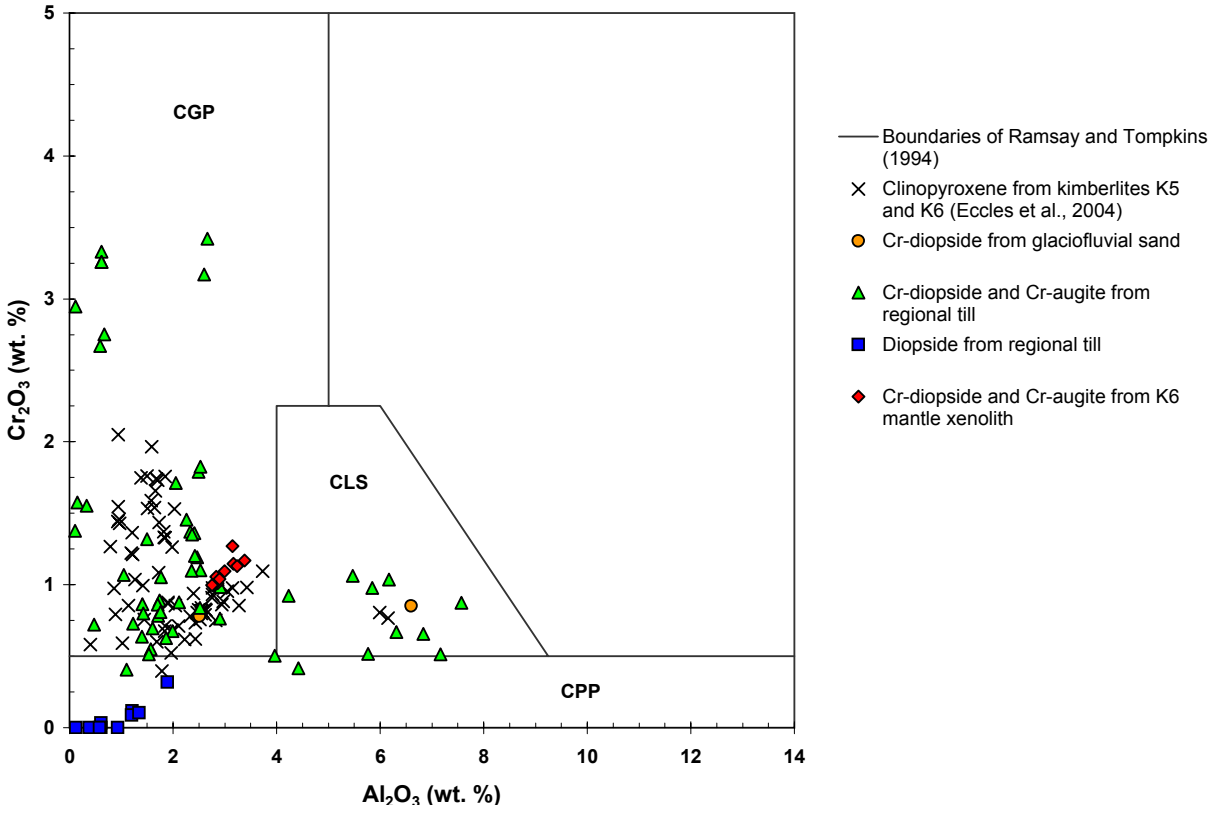

Figure 11. Al_2O_3 versus Cr_2O_3 diagram, after Ramsay and Tompkins (1994), of clinopyroxene grains from till, glaciofluvial sand and kimberlite collected in the Sawn Lake area. (CGP - clinopyroxene from garnet peridotite; CLS – clinopyroxene from spinel lherzolite and 'off-craton' garnet peridotite; CPP – eclogitic, megacrystic and cognate clinopyroxene)

On the Al-Cr-Na ternary plot of Morris et al. (2002), approximately 35% of the chromian clinopyroxene compositions lie within the field defined by xenoliths and xenocrysts from kimberlite (Figure 12). This field, located between jadeite and kosmochlor compositions, outlines lherzolitic clinopyroxenes that have equilibrated at pressures grater than 30 kbar (Morris et al., 2002). Figure 13 shows that K5 and K6 kimberlite clinopyroxene data of Eccles et al. (2004) define two clusters; one cluster within the kimberlite xenolith and xenocryst field of Morris et al. (2002) and a second cluster with higher Al/(Al+Cr+Na) values. The high Al/(Al+Cr+Na) K5 and K6 clinopyroxenes (Eccles et al., 2004) plot in the same part of the diagram as the clinopyroxenes from the K6 mantle xenolith (this study).

The kimberlite clinopyroxenes (Eccles et al., 2004) and the K6 mantle xenocryst clinopyroxenes (this study) are presented in a molar Na/(Na+Al) versus molar Ca/(Ca+Mg+Fe) diagram in Figure 14 (three enstatite analyses from the K4 kimberlite in the Eccles et al. (2004) data set are not shown). The data plot in two clusters labelled A and B on the diagram:

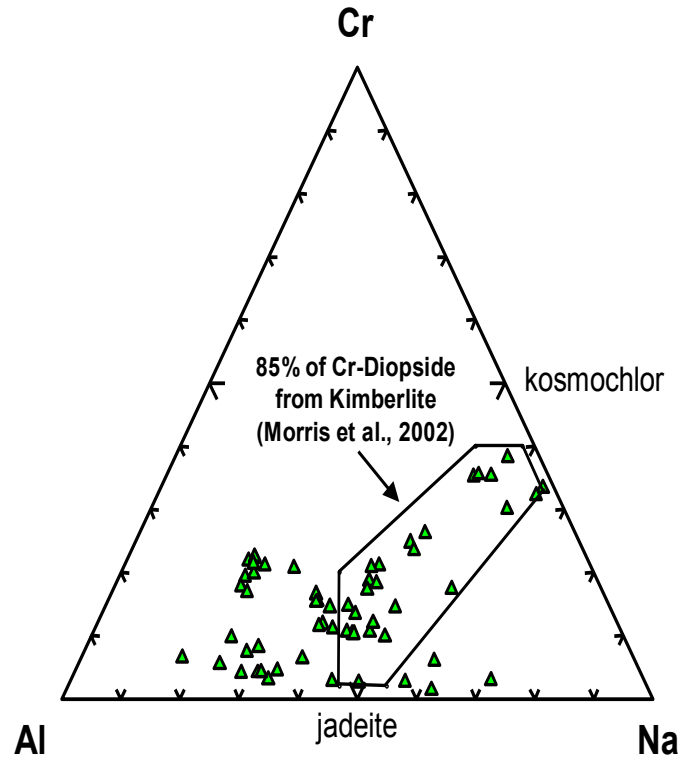

Figure 12. Al-Cr-Na (molar) diagram, after Morris et al. (2002), of clinopyroxene grains from till collected in the Sawn Lake area.

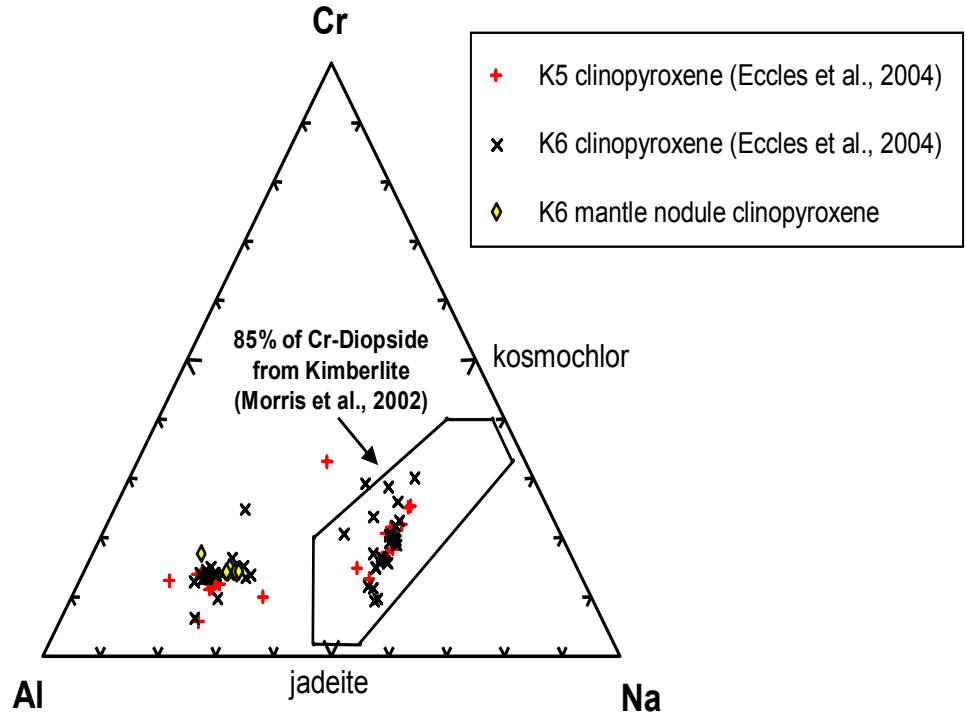

Figure 13. Al-Cr-Na (molar) diagram, after Morris et al. (2002), of clinopyroxene grains from kimberlites K5 and K6 (data from Eccles et al., 2004) and a mantle nodule from the K6 kimberlite.

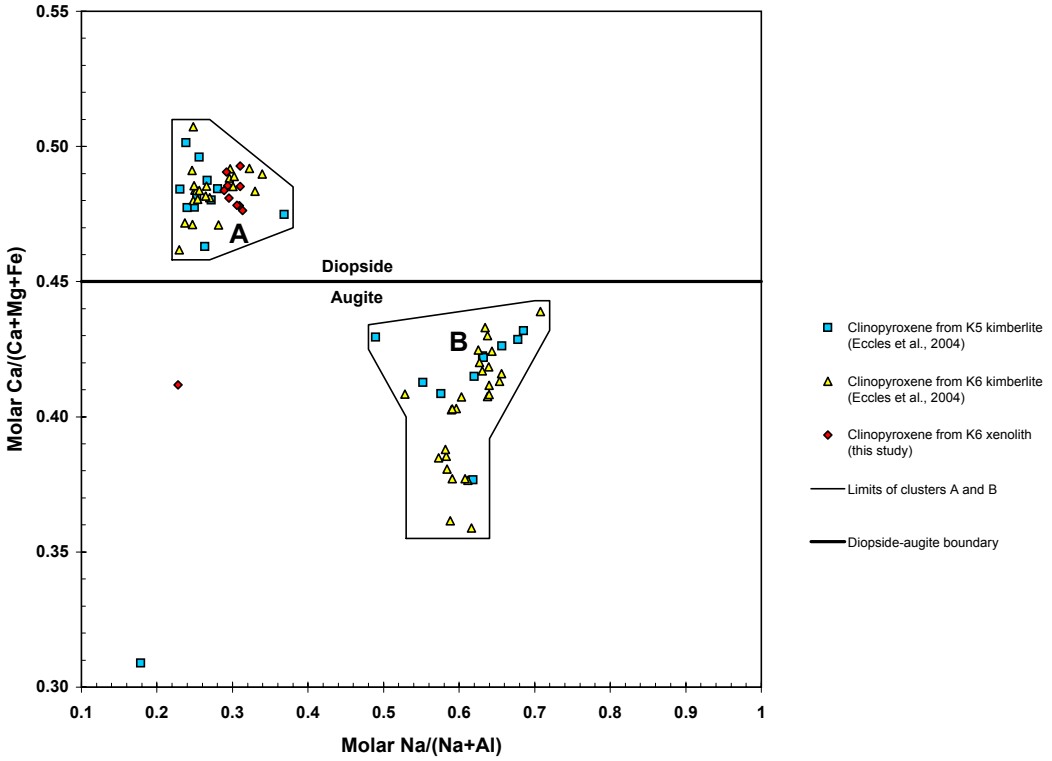

Figure 14. Molar Na/(Na+Al) versus molar Ca/(Ca+Mg+Fe) diagram of clinopyroxene (cpx) from kimberlites in the Sawn Lake area. (Fields A and B represent clusters based upon the kimberlite clinopyroxene analyses. Only clinopyroxenes with >0.40 wt. % Cr_2O_3 are represented.)

- Cluster A, which contains clinopyroxenes from the K5 and K6 kimberlites (including the K6 mantle nodule), plots at low Na/(Na+Al) values and moderate to high Ca/(Ca+Mg+Fe) values within the diopside field.
- Cluster B, which contains clinopyroxenes from the K5 and K6 kimberlites is characterized by moderate Na/(Na+Al) ratios and low Ca/(Ca+Mg+Fe) ratios, and lies within the augite field.

Based upon the relations shown in Figure 14, two clinopyroxene populations (clusters A and B) exist in both the K5 and K6 kimberlites. The K6 mantle xenolith (lherzolite) clinopyroxenes, reported in this study, plot within cluster A. Thus, it is permissive to suggest that cluster A may represent clinopyroxene from lherzolite xenoliths. It is important to note that the clusters are defined upon grains collected from relatively small volumes of kimberlite and, therefore, the boundaries (clusters) may not be representative.

In Figure 15 the clinopyroxene data from the till survey of the Sawn Lake map area is plotted in a molar Na/(Na+Al) versus molar Ca/(Ca+Mg+Fe) diagram along with the kimberlite cluster boundaries from Figure 14. Nearly all of the data plot in the diopside field extending from cluster A to higher Na/(Na+Al) values. None of the till grain data plots within the boundary of cluster B indicating that clinopyroxenes with these characteristics were either not present in any of the till samples or were not recovered.

Attention is drawn to the chemistry of clinopyroxene grains from till samples 2005M and 2505M. The data for four grains from sample 2005M, all chromian diopsides, forms a relatively tight group with high Na/(Na+Al) values. Sample 2005M was collected close to the K4 kimberlite (kimberlite complex). The

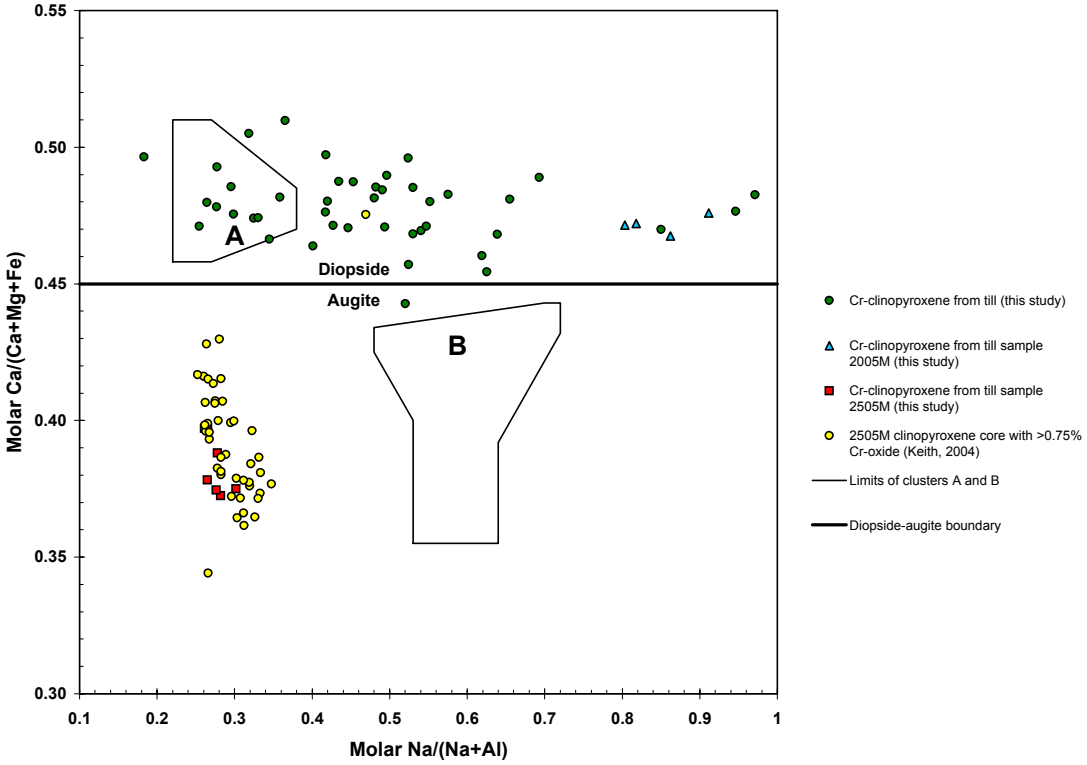

Figure 15. Molar Na/(Na+Al) versus molar Ca/(Ca+Mg+Fe) diagram of clinopyroxene (cpx) from till in the Sawn Lake area. (Fields A and B represent clusters based upon K5 and K6 kimberlite clinopyroxene analyses. Only clinopyroxenes with >0.40 wt. % Cr_2O_3 are represented.)

clinopyroxene data reported in this study for till sample 2505M plots in a group, unique within the till sample results, characterized by low Na/(Na+Al) values and low Ca/(Ca+Mg+Fe) values. It is noteworthy that these clinopyroxenes are chromian augites rather than chromian diopsides. Cr_2O_3 values for these augites range from 0.89 to 1.37 wt. %. Additional microprobe data for clinopyroxenes from till sample 2505M, obtained at the University of Alberta and reported by Keith (2004), are also presented in Figure 15. The analyses of clinopyroxene cores with elevated Cr (greater than 0.75 wt. % Cr_2O_3) are similar to those reported in this study. Sample 2505M is also unique within the till survey samples on the basis of the high clinopyroxene grain counts and low pyrope-olivine-chromite grain counts based on kimberlite-indicator mineral picking: 27 clinopyroxene, three chromite, one olivine and no pyrope grains (Prior et al., 2005). The uniqueness of till sample 2505M, both in the number and chemistry of clinopyroxene grains, suggests that the source rock, probably a kimberlite, is located nearby. The nearest known up-ice kimberlites, K5, K6 and K252, have high chromite to clinopyroxene ratios (Hood and McCandless, 2004).

5.4 Amphibole

Twenty-nine Cr-bearing amphibole analyses, including one duplicate analysis, are listed in Appendix 1. Most these grains are classified as edenite based upon microprobe results with a minority being pargasite. They were picked as possible Cr-diopside grains from heavy mineral fractions prepared with a magstream process (intended to produce concentrates having specific gravities of >3.1) before heavy liquid separation was applied (methylene iodide, specific gravity of 3.3). Nine till sample concentrates were picked prior to heavy liquid separation and five yielded Cr-amphibole (microprobe confirmed). None of the possible Cr-diopside grains picked after heavy liquid separation was found to be Cr-amphibole

based upon microprobe results. The density of edenite is 3.00 to 3.06 and the density of pargasite is 3.07 to 3.18 (Roberts et al., 1990) so these minerals were excluded from the heavy mineral concentrates prepared using heavy liquid.

The Cr-bearing amphibole from the Sawn Lake area for the basis of a University of Alberta study by Keith (2004). That work includes additional information concerning these grains including core and rim microprobe analyses.

5.5 Olivine

The microprobe analysis confirmed minerals from the 2002 Sawn Lake map area samples include 108 forsterite grains, including 88 from the regional till survey, 10 from auger core sample 2739M and 10 from mantle xenolith sample 2559M. All of the grains were picked as olivines.

"Olivine is well represented as an inclusion in diamond from both kimberlites and lamproites; characteristically highly magnesian-rich forsterite ($Fo_{90.2\text{-}96.6}$), with significant amounts of nickel (0.2-0.49 wt % NiO)" (Fipke et al., 1995, p. 65). Figure 16 illustrates that the majority of the Sawn Lake forsterite grains from till have these characteristics. However, this compositional range is not unique to kimberlites and lamproites (e.g., analysis 5 (olivine from dunite) presented by Deer et al., 1962, p. 10). The two Sawn Lake grains with Mg# values below 81 and the one grain with a NiO content of less than 0.1% may not be from kimberlite. The grains from the K5, K6 and K14 kimberlites, including those from the K6 mantle xenolith, tend to have somewhat higher Mg# and lower NiO values than the till grains.

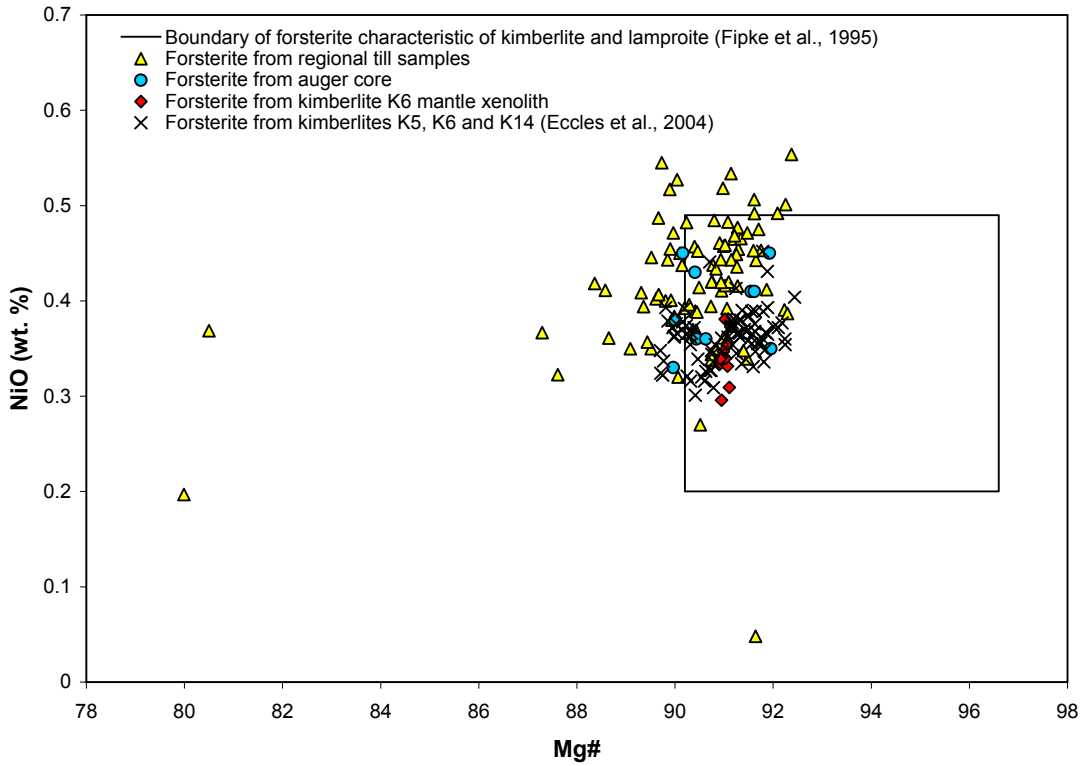

Figure 16. Mg# versus NiO diagram of forsterite grains from till and kimberlite collected in the Sawn Lake area. [Eccles et al. (2004) forsterite grains having totals of <98.00% are not shown; Mg# = 100 x molar Mg / (molar Mg+Fe)].

The Mg and Cr range of olivine from inclusions in diamonds (Fipke et al., 1995) is shown in Figure 17 along with the compositions of 30 Sawn Lake forsterite grains for which Cr_2O_3 data is available. The ten

K6 xenolith forsterite grains all have Mg# values near 91, contain a maximum of 0.01% Cr_2O_3 and plot below the diamond inclusion field. Three of the Sawn Lake forsterites from till plot within the diamond inclusion field and an additional five plot close to the boundary. In addition to the diamond inclusion field, Fipke et al. (1995, p.67) show compositions of olivines from various diamondiferous kimberlites – several of these plot outside of the diamond inclusion field with Mg# values of 88.2 to 92.5 and Cr_2O_3 values of 0.0 to 0.1. All of the Sawn Lake forsterite grains that plot outside of the diamond-inclusion field fall within this range of Mg# and Cr_2O_3 values. The range of Mg# and Cr_2O_3 values displayed by the forsterite grains from till are similar to those of grains from the K5, K6 and K14 kimberlites documented by Eccles et al. (2004).

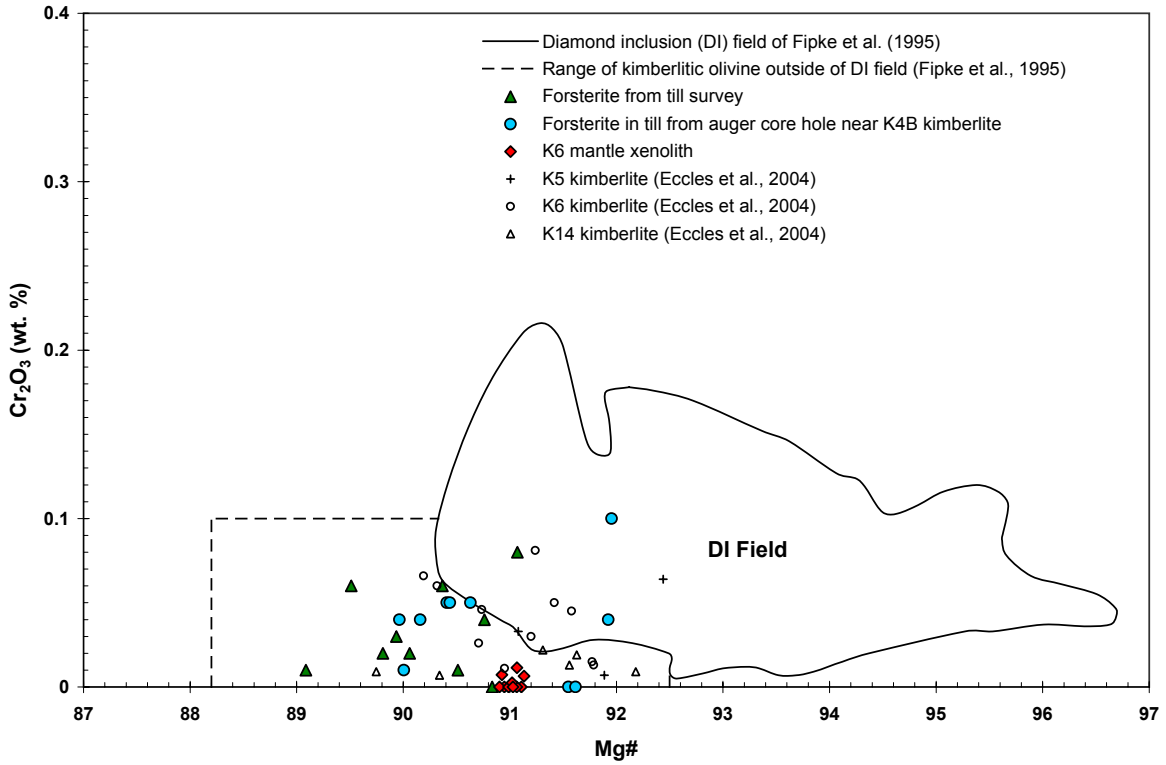

Figure 17. Mg# versus Cr_2O_3 diagram, after Fipke et al. (1995), of forsterite grains from till and kimberlite collected in the Sawn Lake area. [Eccles et al. (2004) forsterite grains having Cr_2O_3 values of 0.00% or totals of <98.00% are not shown; Mg# = 100 x molar Mg / (molar Mg+Fe)].

5.6 Spinel Group

Microprobe analysis confirmed minerals from the 2002 till survey of the Sawn Lake map area include 75 spinel group minerals consisting of 63 chromite grains, 10 magnesiochromite grains and two spinel grains (Table 4).

Table 4. Spinel group mineralogy

Mineral (molar ratio classification)	Total Confirmed	Original Picked Grain Identification	
		Chromite	Ilmenite
Chromite	63	60	3
Magnesiochromite	10	9	1
Spinel	2	2	0

On the MgO versus Cr_2O_3 plot, shown in Figure 18, one chromite grain from till lies within the field of diamond intergrowth chromites defined by Fipke et al. (1995). Several of the chromite and magnesiochromite grains from till have similar MgO values and only slightly lower Cr_2O_3 values than those of the diamond intergrowth field. Chromite inclusions within diamonds, based on the work of Gurney and Zweistra (1995) and Fipke et al. (1995), tend to have somewhat higher contents of both Cr_2O_3 and MgO than the Sawn Lake area till grains. Spinel group minerals from kimberlites K5, K6 and K14 (Eccles et al., 2004) tend to have somewhat higher MgO values than the till grains, although there is considerable overlap.

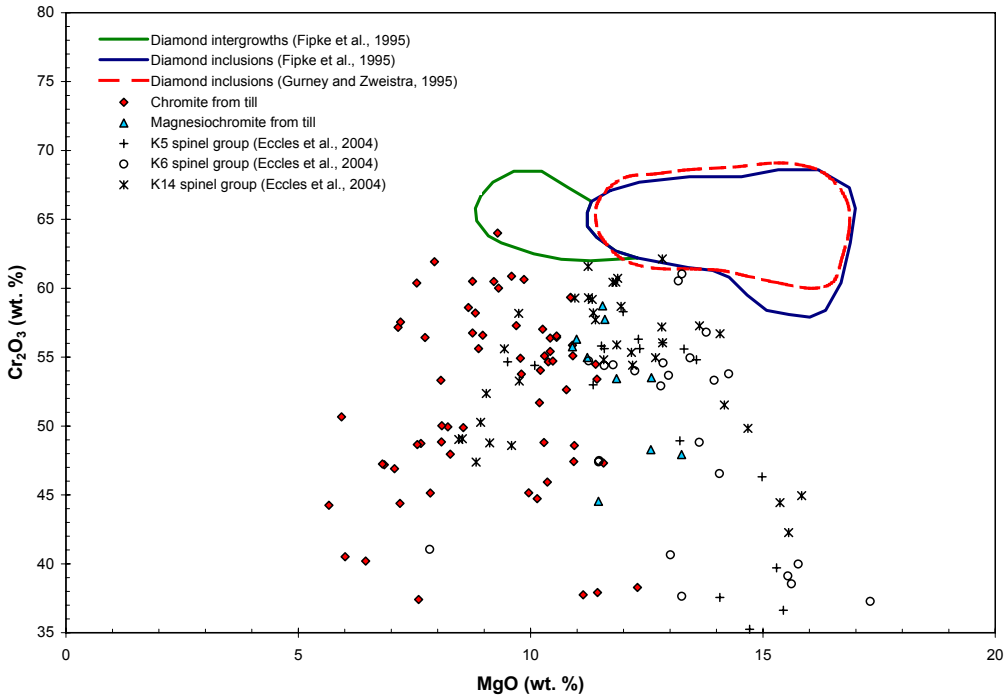

Figure 18. MgO versus Cr_2O_3 diagram, after Fipke et al. (1995) and Gurney and Zweistra (1995), of spinel group mineral grains from till and kimberlite collected in the Sawn Lake area.

On the TiO_2 versus Cr_2O_3 discrimination diagram of Fipke (1994) and Fipke et al. (1995), many of the till chromite grains with elevated Ti contents plot in the field unique to lamproites and kimberlites (Figure 19). The two chromites from till with the highest Cr_2O_3 values plot within the diamond inclusion and intergrowth field. The distribution of the grains from kimberlite (Eccles et al., 2004) on the TiO_2 versus Cr_2O_3 diagram is generally similar to that of the till grains. Of the spinel group minerals picked from till the only grains submitted for microprobe analyses were those picked as chromites. Thus, no geological significance can be attributed to the greater abundance of lower Cr_2O_3 values in the kimberlite data compared to the till data.

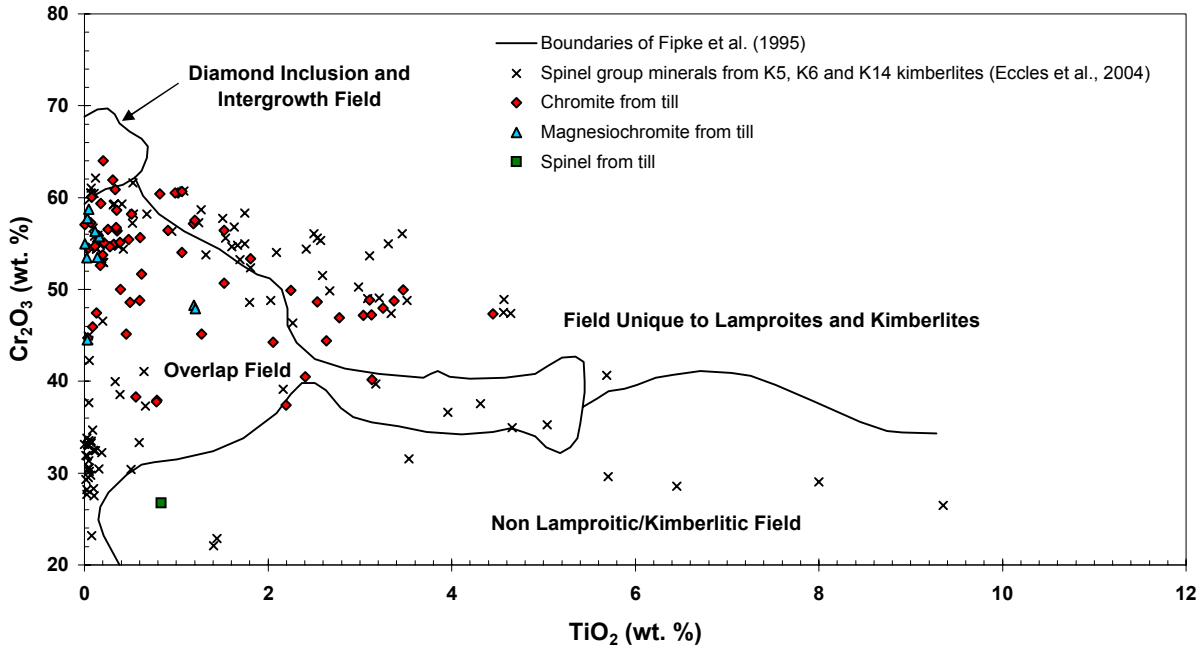

Figure 19. TiO_2 versus Cr_2O_3 diagram, after Fipke et al. (1995), of spinel group mineral grains from till and kimberlite collected in the Sawn Lake area.

5.7 Ilmenite

Four grains picked as ilmenite and submitted for microprobe analyses were identified as three chromites and one magnesiochromite upon interpretation of the results. However, two grains picked as chromites were found to be ilmenite based upon microprobe analyses. Both of these grains have low MgO contents (<0.1%) and are non-kimberlitic (Figure 20). The Eccles et al. (2004) data set does not contain any analyses of ilmenites from the Buffalo Head Hills kimberlite field.

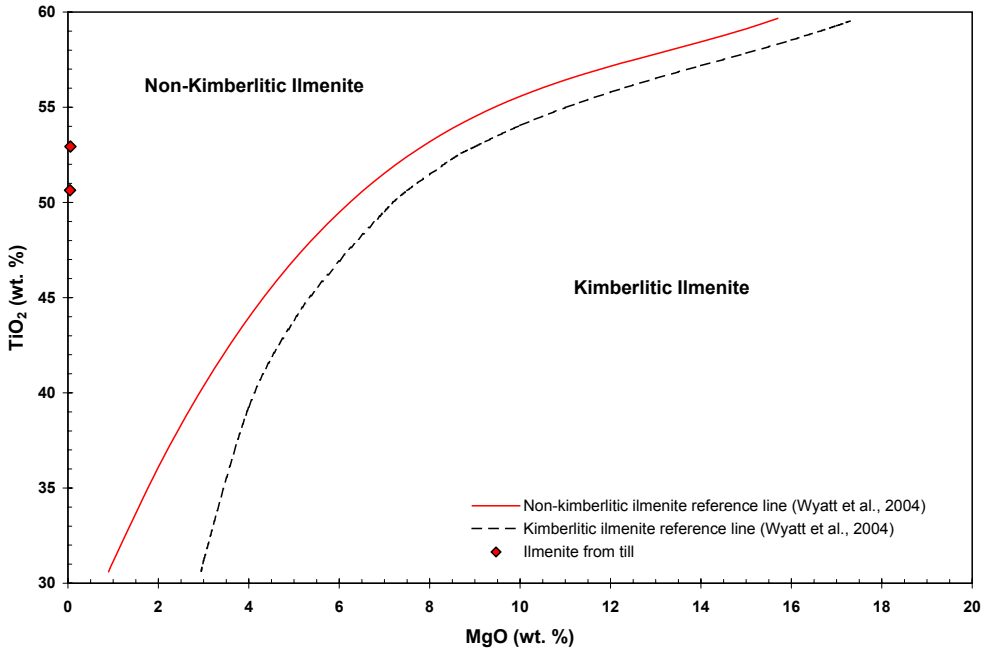

Figure 20. MgO versus TiO_2 diagram, after Wyatt et al. (2004), of ilmenite grains from till collected in the Sawn Lake area.

6 Discussion

Xenocryst data for representative kimberlites in the Sawn Lake map area, from Hood and McCandless (2004), is presented in Table 5.

Table 5. Xenocryst abundances of representative kimberlites in the Sawn Lake map area (data from Hood and McCandless, 2004). K4B is in the southern kimberlite group of Hood and McCandless (2004) and the remainder are in the northern group.

Kimberlite	Estimated Diamond Grade (cpht*)	Peridotitic Pyrope (grains/kg)	Low-Cr Pyrope (grains/kg)	Chromite (grains/kg)	Mg Ilmenite (grains/kg)	Clinopyroxene (grains/kg)	Total (grains/kg)
K8	<1	0	0	0.1	0	0	0.1
K14	11.8	63.7	21.2	148.7	0	26.8	260.4
K7C	0	0	0	1.7	0	4.0	5.7
K7A	0	0	3.3	3.3	0	6.7	13.3
K252	55.0	0.3	0.1	1.0	0	0.3	1.7
K6	7.2	1.7	~0	13.1	0	1.8	16.6
K5	0.36	0.6	0.1	22.6	0	0	23.3
K4B	~0	665.5	14.6	1167.5	1.4	1.8	1850.8
Average		91.5	4.9	169.8	0.2	5.2	271.5
Median		0.5	0.1	8.2	0	1.8	10.6

*carats per hundred tonnes

Clearly, kimberlite K4B has the greatest capacity per kilogram to yield xenocryst minerals during periods of glaciation. Kimberlite K14 contains about one order of magnitude less xenocrysts than kimberlite K4B and kimberlites K7A, K6 and K5 contain about two orders of magnitude less xenocrysts than kimberlite K4B, on a per kilogram basis. However, given the large surface area of kimberlite K5, approximately 40 hectares (Skelton et al., 2003), dispersal from kimberlite K5 may be more significant than the grains per kilogram numbers suggest. Unfortunately, no data is available for the other 11 kimberlites in the Sawn Lake map area and no detailed information has been published on olivine contents. However, based upon the work of Hood and McCandless (2004), olivine is by far the most abundant mineral in most concentrates obtained from kimberlites of the Buffalo Head Hills area.

The relative proportion of grains recovered from the Sawn Lake map area till survey is in general agreement with kimberlite data of Hood and McCandless (2004). Olivine, pyrope and chromite are the dominant kimberlite-indicator minerals recovered from till with subordinate amounts of chromian clinopyroxene and Mg-rich almandine (pyrope-almandine). No microprobe confirmed Mg-rich ilmenite (picroilmenite) grains were recovered from the till consistent with the very low contents of Mg ilmenite within kimberlites of the Sawn Lake map area.

The very high peridotitic pyrope and chromite content of the K4B kimberlite, combined with the geographic distribution of pyrope-rich and chromite-rich till in the southwestern part of the Sawn Lake map area (Prior et al., 2005), strongly supports the interpretation that the pyrope-chromite +/- olivine

dispersal train trending west-southwest from the area of the K4 kimberlite complex is largely sourced from the K4 kimberlite complex (which includes the K4A, K4B and K4C kimberlites).

Based upon chemical data for grains extracted form the K5, K6 and K14 kimberlites presented by Eccles et al. (2004), there is no clear linkage between these kimberlites and the grains recovered from the 2002 Sawn Lake area till samples. A general lack of similarity is evident on plots of the pyrope, clinopyroxene and, to a lesser extent, spinel (chromite) compositions.

Pyrope from till sample 2530M, the most northerly sample from the Sawn Lake area till survey with a strongly elevated kimberlite-indicator mineral grain content (Prior et al., 2005), has an unusually high proportion of grains with elevated Al_2O_3/SiO_2 values. As the source of these grains may remain to be discovered (Prior et al., 2005), this distinctive chemical trait may aid further exploration.

The clinopyroxene grains recovered from the till survey exhibit considerable chemical variability between grains. Till sample 2505M, collected approximately 1.5 km north-northwest of the K4 kimberlite complex, yielded 27 clinopyroxene (chromian augite) grains with chemical compositions that are, based upon the available data, unique. This till sample is also unusual in having a kimberlite-indicator grain population that is strongly dominated by clinopyroxene.

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Appendix 1 – Microprobe Results

Picked as: Classification of mineral grain during picking of concentrate
Mineral (Post-Probe): Mineral name based upon molar ratio evaluation of microprobe data; G0 to G12 garnet classification after Grütter et al. (2004)

AMP: Amphibole

CHR: Chromite

CPX: Cr diopside

DEF: Definite

DI: Diopside

ECL: Eclogitic garnet

G1 to G12: Garnet classification scheme of Grütter et al. (2004)

ILM: Ilmenite

OLI : Olivine

POS: Possible

PYR: Pyrope

TOUR: Tourmaline

Grain_ID	Grain Source	Picked As	Mineral (Post-Probe)	SiO2	TiO2	Al2O3	Cr2O3	FeO	MgO	MnO	CaO	Na2O	K2O	NiO	ZnO	Nb2O5	V2O5	Total
2001M_LK_2004-03_Pt-0049_Gr-01	till	CPX	clinopyroxene_chromian diopside	52.58	0.13	2.52	0.84	4.86	14.29	0.07	22.24	1.48	0.00	0.05				99.05
2003M_LK_2003-02_Pt-0001_Gr-01	till	PYR	garnet_pyrope_G12	40.74	0.02	16.72	8.38	8.15	17.24	0.60	7.61	0.02	0.00	0.00	0.01			99.48
2004M_LK_2003-02_Pt-1005_Gr-01	till	CHR	ilmenite-rutile	0.57	67.20	1.61	0.01	21.31	0.02	0.41	0.18	0.00	0.00	0.01	0.04	0.23	0.21	91.58
2004M_LK_2004-03_Pt-0031_Gr-01	till	ECL	garnet_pyrope_G9	41.14	0.23	22.57	1.44	9.33	19.85	0.40	4.42	0.09	0.01	0.01				99.49
2005M_LK_2003-02_Pt-0002_Gr-01	till	PYR	garnet_pyrope_G9	41.45	0.01	18.89	4.91	8.27	19.00	0.62	6.13	0.03	0.00	0.00	0.03			99.34
2005M_LK_2003-02_Pt-0003_Gr-02	till	PYR	garnet_pyrope_G9	41.15	0.01	17.54	6.62	8.17	18.02	0.52	6.99	0.02	0.00	0.00	0.00			99.04
2005M_LK_2003-02_Pt-0004_Gr-03	till	PYR	garnet_pyrope_G9	41.78	0.00	20.51	3.50	7.79	19.85	0.52	5.51	0.01	0.01	0.00	0.03			99.51
2005M_LK_2003-02_Pt-0005_Gr-04	till	PYR	garnet_pyrope_G9	41.29	0.02	17.30	7.32	7.52	19.29	0.41	6.35	0.02	0.00	0.03	0.00			99.56
2005M_LK_2003-02_Pt-0006_Gr-05	till	PYR	garnet_pyrope_G9	41.77	0.02	20.54	3.28	7.83	19.97	0.58	5.20	0.01	0.01	0.01	0.02			99.25
2005M_LK_2003-02_Pt-0007_Gr-01	till	PYR	garnet_pyrope_G9	41.52	0.14	19.47	4.16	8.42	19.43	0.47	5.40	0.00	0.00	0.01	0.03			99.04
2005M_LK_2003-02_Pt-0008_Gr-02	till	PYR	garnet_pyrope_G9	41.56	0.41	19.75	3.12	8.25	19.69	0.47	5.03	0.04	0.00	0.01	0.00			98.32
2005M_LK_2003-02_Pt-0009_Gr-03	till	PYR	garnet_pyrope_G9	41.78	0.35	19.58	3.45	8.59	19.88	0.42	4.85	0.03	0.00	0.01	0.06			98.98
2005M_LK_2003-02_Pt-0010_Gr-04	till	PYR	garnet_pyrope_G9	41.12	0.02	17.90	6.37	8.47	18.44	0.50	6.28	0.01	0.00	0.04	0.06			99.21
2005M_LK_2003-02_Pt-0011_Gr-05	till	PYR	garnet_pyrope_G9	41.38	0.23	17.10	6.89	8.09	18.84	0.44	6.04	0.03	0.00	0.00	0.00			99.05
2005M_LK_2003-02_Pt-0141_Gr-01	till	ECL-POS	garnet_pyrope_G9	42.03	0.32	21.47	1.73	8.82	20.63	0.37	4.17	0.09	0.00	0.03	0.02			99.67
2005M_LK_2003-02_Pt-0142_Gr-01	till	CPX-DEF	clinopyroxene_chromian diopside	55.30	0.11	0.15	1.58	2.04	16.89	0.06	22.79	0.95	0.03	0.09	0.00			99.98
2005M_LK_2003-02_Pt-1006_Gr-01	till	CHR	spinel_chromite	0.02	0.35	6.39	56.38	24.98	10.42	0.38	0.00	0.04	0.01	0.12	0.16	0.21	0.31	99.46
2005M_LK_2003-02_Pt-1007_Gr-02	till	CHR	spinel_chromite	0.02	1.52	6.09	56.44	24.17	10.56	0.37	0.02	0.01	0.00	0.09	0.13	0.20	0.26	99.62
2005M_LK_2003-02_Pt-1008_Gr-03	till	CHR	spinel_chromite	0.02	0.18	5.83	59.34	22.58	10.86	0.34	0.00	0.00	0.00	0.10	0.12	0.17	0.23	99.54
2005M_LK_2003-02_Pt-1009_Gr-04	till	CHR	spinel_chromite	0.01	1.02	0.91	60.49	26.34	9.21	0.41	0.00	0.00	0.00	0.14	0.17	0.19	0.36	98.89
2005M_LK_2003-02_Pt-1010_Gr-05	till	CHR	spinel_chromite	0.02	0.50	11.69	48.59	26.48	10.94	0.31	0.00	0.03	0.00	0.17	0.08	0.15	0.24	98.96
2005M_LK_2003-02_Pt-1011_Gr-06	till	CHR	spinel_chromite	0.05	0.45	10.92	45.15	30.28	9.96	0.44	0.00	0.00	0.01	0.18	0.15	0.21	0.27	97.79
2005M_LK_2003-02_Pt-1012_Gr-07	till	CHR	spinel_chromite	0.00	3.11	1.02	48.85	35.27	8.08	0.46	0.00	0.00	0.00	0.20	0.06	0.21	0.22	97.26
2005M_LK_2003-02_Pt-1013_Gr-08	till	CHR	spinel_chromite	0.01	0.60	13.21	48.81	24.32	10.29	0.30	0.00	0.00	0.02	0.11	0.20	0.20	0.33	98.07
2005M_LK_2003-02_Pt-1014_Gr-09	till	CHR	spinel_chromite	0.02	0.48	10.32	55.41	21.80	10.42	0.24	0.00	0.07	0.00	0.18	0.15	0.15	0.27	99.25
2005M_LK_2003-02_Pt-1015_Gr-10	till	CHR	spinel_chromite	0.03	2.78	2.64	46.90	37.52	7.07	0.44	0.00	0.00	0.01	0.21	0.20	0.22	0.30	98.01
2005M_LK_2003-04_Pt-0001_Gr-01	till	CPX	clinopyroxene_chromian diopside	54.68	0.02	0.67	2.75	1.95	15.79	0.04	20.96	1.67	0.00					98.54
2005M_LK_2003-04_Pt-0002_Gr-02	till	CPX	amphibole_pargasite	44.93	0.33	12.13	1.68	2.97	18.74	0.06	11.89	2.39	0.94					96.06
2005M_LK_2003-04_Pt-0003_Gr-03	till	CPX	amphibole_edenite	46.22	0.02	10.37	1.89	2.89	19.67	0.06	10.69	3.27	0.96					96.05
2005M_LK_2003-04_Pt-0004_Gr-04-1st	till	CPX	amphibole_edenite	46.51	0.12	11.00	1.81	3.35	18.98	0.09	9.57	3.88	0.44					95.75
2005M_LK_2003-04_Pt-0006_Gr-05	till	CPX	amphibole_edenite	45.35	0.22	11.13	2.06	2.31	19.19	0.05	10.88	2.96	1.25					95.39
2005M_LK_2003-04_Pt-0007_Gr-06	till	CPX	amphibole_edenite	47.37	0.05	10.19	2.18	2.17	19.82	0.06	10.60	2.98	0.95					96.38
2005M_LK_2003-04_Pt-0008_Gr-07	till	CPX	amphibole_pargasite	44.78	0.06	12.94	1.31	2.57	18.49	0.06	12.27	2.39	0.62					95.49
2005M_LK_2003-04_Pt-0009_Gr-08	till	CPX	amphibole_edenite	47.98	0.18	8.67	1.70	2.91	20.28	0.07	11.34	2.74	0.82					96.69
2005M_LK_2003-04_Pt-0010_Gr-09	till	CPX	clinopyroxene_chromian diopside	54.55	0.09	0.34	1.55	2.68	16.10	0.10	21.50	1.28	0.00					98.19
2005M_LK_2003-04_Pt-0011_Gr-10	till	CPX	amphibole_edenite	47.03	0.03	10.09	2.17	2.09	19.92	0.04	10.82	3.10	0.99					96.28
2005M_LK_2003-04_Pt-0012_Gr-11	till	CPX	clinopyroxene_chromian diopside	55.11	0.01	0.59	2.67	1.91	15.92	0.09	21.14	1.62	0.00					99.06
2005M_LK_2003-04_Pt-0013_Gr-12	till	CPX	amphibole_edenite	45.82	0.02	11.41	2.21	2.93	18.94	0.07	9.49	3.75	0.70					95.34

Grain_ID	Grain Source	Picked As	Mineral (Post-Probe)	SiO2	TiO2	Al2O3	Cr2O3	FeO	MgO	MnO	CaO	Na2O	K2O	NiO	ZnO	Nb2O5	V2O5	Total
2005M_LK_2003-06_Pt-2001_Gr-ECL01	till	ECL	garnet_almandine_G3	38.33	0.06	21.93	0.34	22.08	4.92	1.41	11.97	0.01	0.00	0.00	0.10	0.04		101.18
2005M_LK_2004-03_Pt-0032_Gr-01	till	ECL	garnet_almandine_G3	38.71	0.00	22.23	0.00	21.40	8.77	0.52	8.32	0.01	0.01	0.00				99.97
2005M_LK_2004-03_Pt-0033_Gr-02	till	ECL	garnet_almandine_G0	38.14	0.00	22.78	0.00	26.62	10.90	0.34	1.31	0.01	0.02	0.00				100.12
2005M_LK_2004-03_Pt-0034_Gr-03	till	ECL	garnet_almandine_G4	37.93	0.00	22.80	0.00	26.07	10.71	0.32	2.18	0.01	0.00	0.00				100.02
2005M_LK_2004-03_Pt-0035_Gr-04	till	ECL	garnet_almandine_G3	38.80	0.00	22.86	0.00	20.47	9.04	0.59	8.11	0.00	0.03	0.00				99.91
2005M_LK_2004-03_Pt-0036_Gr-05	till	ECL	garnet_pyrope_G4	41.13	0.00	23.49	0.63	11.27	18.36	0.41	4.49	0.03	0.02	0.02				99.85
2005M_LK_2004-03_Pt-0050_Gr-01	till	CPX	garnet_Cr-grossular	36.92	0.50	10.33	9.98	5.80	0.26	0.05	35.19	0.00	0.02	0.00				99.04
2006M_LK_2003-02_Pt-0012_Gr-01	till	PYR	garnet_pyrope_G12	40.73	0.07	16.05	9.11	7.58	17.34	0.56	7.76	0.00	0.00	0.01	0.00			99.22
2006M_LK_2003-02_Pt-0013_Gr-02	till	PYR	garnet_pyrope_G9	41.80	0.02	19.82	4.34	7.72	19.36	0.51	5.76	0.00	0.00	0.01	0.00			99.34
2006M_LK_2003-02_Pt-0014_Gr-03	till	PYR	garnet_pyrope_G12	40.22	0.05	14.54	10.71	7.81	15.85	0.52	9.09	0.00	0.02	0.04	0.00			98.85
2006M_LK_2003-02_Pt-0015_Gr-04	till	PYR	garnet_pyrope_G12	40.60	0.01	16.03	8.97	7.80	16.27	0.58	9.02	0.01	0.00	0.00	0.03			99.31
2006M_LK_2003-02_Pt-0016_Gr-05	till	PYR	garnet_pyrope_G9	41.23	0.00	19.51	4.99	7.75	19.43	0.49	5.96	0.03	0.01	0.00	0.00			99.40
2006M_LK_2003-02_Pt-0017_Gr-06	till	PYR	garnet_pyrope_G9	41.39	0.02	20.32	3.40	8.86	19.59	0.54	5.38	0.02	0.01	0.00	0.00			99.53
2006M_LK_2003-02_Pt-0018_Gr-07	till	PYR	garnet_pyrope_G9	41.05	0.02	19.04	5.00	7.83	19.27	0.57	6.14	0.03	0.04	0.01	0.00			99.00
2006M_LK_2003-02_Pt-0019_Gr-08	till	PYR	garnet_pyrope_G9	41.67	0.01	19.65	4.25	7.77	19.82	0.54	5.27	0.00	0.00	0.02	0.03			99.02
2006M_LK_2003-02_Pt-0020_Gr-01	till	PYR	garnet_pyrope_G9	41.56	0.33	18.62	5.37	8.36	19.37	0.48	5.39	0.07	0.00	0.02	0.00			99.57
2006M_LK_2003-02_Pt-0021_Gr-02	till	PYR	garnet_pyrope_G9	40.93	0.07	19.03	5.22	8.45	18.74	0.45	6.18	0.01	0.00	0.00	0.02			99.10
2006M_LK_2003-02_Pt-0022_Gr-03	till	PYR	garnet_pyrope_G9	41.59	0.05	20.23	3.39	8.19	19.54	0.59	5.44	0.00	0.00	0.00	0.01			99.03
2006M_LK_2003-02_Pt-1016_Gr-01	till	CHR	spinel_chromite	0.05	0.17	12.39	53.40	20.58	11.43	0.30	0.00	0.00	0.00	0.11	0.17	0.16	0.24	98.76
2006M_LK_2003-02_Pt-1017_Gr-02	till	CHR	spinel_chromite	0.04	3.37	0.67	48.74	36.11	7.64	0.47	0.00	0.04	0.02	0.20	0.12	0.22	0.23	97.63
2006M_LK_2003-02_Pt-1018_Gr-03	till	CHR	spinel_chromite	0.00	0.15	12.31	55.87	19.63	10.90	0.33	0.00	0.00	0.01	0.09	0.08	0.17	0.19	99.54
2006M_LK_2003-02_Pt-1019_Gr-04	till	CHR	spinel_chromite	0.00	3.47	0.89	49.94	34.53	8.22	0.48	0.00	0.00	0.00	0.22	0.11	0.21	0.28	98.07
2006M_LK_2003-02_Pt-1020_Gr-05	till	CHR	spinel_chromite	0.03	0.21	0.93	64.01	23.30	9.29	0.41	0.01	0.00	0.01	0.06	0.11	0.16	0.31	98.51
2006M_LK_2003-02_Pt-1021_Gr-06	till	CHR	spinel_magnesiochromite	0.01	0.16	12.22	55.76	19.33	10.90	0.33	0.02	0.00	0.00	0.09	0.14	0.18	0.19	99.12
2006M_LK_2003-02_Pt-1022_Gr-07	till	CHR	spinel_chromite	0.01	0.31	1.21	61.93	26.76	7.93	0.40	0.00	0.06	0.00	0.12	0.20	0.20	0.22	99.13
2006M_LK_2003-02_Pt-1023_Gr-08	till	CHR	spinel_chromite	0.03	0.33	4.48	60.87	22.69	9.59	0.40	0.01	0.00	0.00	0.06	0.18	0.22	0.15	98.87
2006M_LK_2003-02_Pt-1024_Gr-09	till	CHR	spinel_chromite	0.04	0.35	0.86	58.60	29.10	8.66	0.45	0.00	0.00	0.00	0.16	0.18	0.18	0.17	98.58
2006M_LK_2003-02_Pt-1025_Gr-10	till	CHR	spinel_spinel-chromite	0.03	0.83	29.72	26.75	25.26	14.97	0.25	0.00	0.00	0.01	0.28	0.18	0.17	0.14	98.46
2006M_LK_2003-04_Pt-0014_Gr-01	till	CPX	clinopyroxene_chromian diopside	54.12	0.04	1.40	0.64	3.46	16.13	0.11	22.33	0.68	0.00					98.92
2006M_LK_2003-06_Pt-2024_Gr-CHR01	till	CHR	spinel_chromite	0.02	0.51	3.95	58.20	27.25	8.81	0.36	0.00	0.00	0.00	0.11	0.22	0.10		99.50
2006M_LK_2003-06_Pt-2025_Gr-CHR02	till	CHR	spinel_chromite	0.08	0.08	3.40	60.01	26.51	9.31	0.37	0.00	0.00	0.00	0.01	0.17	0.11		100.02
2006M_LK_2003-06_Pt-2026_Gr-CHR03	till	CHR	spinel_chromite	0.10	0.20	10.24	53.77	25.36	9.80	0.37	0.01	0.00	0.00	0.13	0.17	0.07		100.20
2006M_LK_2003-06_Pt-2027_Gr-CHR04	till	CHR	spinel_chromite	0.06	0.32	12.18	54.92	22.58	9.78	0.30	0.00	0.01	0.00	0.13	0.32	0.10		100.67
2006M_LK_2003-06_Pt-2028_Gr-CHR05	till	CHR	spinel_chromite	0.07	0.91	3.81	56.42	29.16	7.73	0.49	0.00	0.00	0.00	0.07	0.12	0.06		98.82
2006M_LK_2004-03_Pt-0037_Gr-01	till	ECL	garnet_almandine_G3	38.08	0.00	22.68	0.00	23.47	7.29	0.46	7.77	0.00	0.00	0.01				99.77
2006M_LK_2004-03_Pt-0038_Gr-02	till	ECL	garnet_pyrope_G4	41.72	0.00	24.47	0.00	8.94	20.09	0.47	4.06	0.04	0.00	0.00				99.78
2006M_LK_2004-03_Pt-0039_Gr-01	till	ECL	garnet_almandine_G4	37.83	0.00	22.35	0.00	26.62	7.99	0.54	4.71	0.00	0.01	0.08				100.13
2006M_LK_2004-03_Pt-0051_Gr-01	till	CPX	clinopyroxene_chromian diopside	52.03	0.06	5.85	0.98	2.71	15.33	0.07	20.28	2.38	0.00	0.07				99.75

Grain_ID	Grain Source	Picked As	Mineral (Post-Probe)	SiO2	TiO2	Al2O3	Cr2O3	FeO	MgO	MnO	CaO	Na2O	K2O	NiO	ZnO	Nb2O5	V2O5	Total
2007M_LK_2003-02_Pt-0023_Gr-01	till	PYR	garnet_pyrope_G9	40.79	0.02	16.63	8.09	7.80	17.75	0.59	7.31	0.04	0.00	0.00	0.00			99.02
2007M_LK_2003-02_Pt-0024_Gr-02	till	PYR	garnet_pyrope_G9	40.98	0.03	18.64	6.23	8.35	18.21	0.51	6.59	0.01	0.00	0.00	0.03			99.57
2007M_LK_2003-02_Pt-0025_Gr-03	till	PYR	garnet_pyrope_G9	40.93	0.04	18.98	5.89	7.79	19.11	0.51	5.98	0.00	0.00	0.02	0.00			99.26
2007M_LK_2003-02_Pt-0026_Gr-04	till	PYR	garnet_pyrope_G9	40.62	0.09	15.37	9.73	7.67	17.90	0.50	7.33	0.05	0.00	0.02	0.03			99.32
2007M_LK_2003-02_Pt-0027_Gr-05	till	PYR	garnet_pyrope_G12	40.63	0.06	15.74	9.40	8.39	16.98	0.63	7.81	0.01	0.03	0.02	0.02			99.71
2007M_LK_2003-02_Pt-0028_Gr-01	till	PYR	garnet_pyrope_G9	41.43	0.08	19.73	4.09	8.89	18.52	0.54	6.00	0.02	0.01	0.02	0.02			99.34
2007M_LK_2003-02_Pt-0029_Gr-02	till	PYR	garnet_pyrope_G9	41.76	0.06	19.95	4.00	7.35	20.19	0.51	5.15	0.05	0.03	0.00	0.00			99.06
2007M_LK_2003-02_Pt-0030_Gr-03	till	PYR	garnet_pyrope_G9	40.97	0.02	19.72	4.57	7.94	19.34	0.57	5.84	0.03	0.00	0.00	0.00			99.00
2007M_LK_2003-02_Pt-0031_Gr-04	till	PYR	garnet_pyrope_G9	41.72	0.01	20.71	2.99	7.78	20.38	0.59	5.12	0.02	0.02	0.02	0.03			99.39
2007M_LK_2003-02_Pt-0032_Gr-05	till	PYR	garnet_pyrope_G9	41.53	0.02	19.69	4.20	8.57	19.23	0.45	5.33	0.01	0.00	0.00	0.00			99.04
2007M_LK_2003-02_Pt-0143_Gr-01	till	CPX	clinopyroxene_chromian diopside	55.07	0.09	1.50	1.32	1.99	16.74	0.08	22.12	1.10	0.00	0.02	0.03			100.05
2007M_LK_2003-02_Pt-1001_Gr-01	till	ILM	spinel_magnesiochromite	0.02	0.14	12.16	53.51	20.88	12.60	0.34	0.01	0.03	0.01	0.34	0.17	0.11	0.18	100.32
2007M_LK_2003-02_Pt-1002_Gr-02	till	ILM	spinel_chromite	0.00	2.53	2.77	48.65	35.06	7.56	0.49	0.00	0.00	0.00	0.19	0.18	0.18	0.35	97.61
2007M_LK_2003-02_Pt-1026_Gr-01	till	CHR	spinel_chromite	0.02	1.19	0.30	57.17	30.70	7.15	0.54	0.01	0.00	0.00	0.17	0.19	0.25	0.33	97.69
2007M_LK_2003-02_Pt-1027_Gr-02	till	CHR	spinel_chromite	0.01	3.04	0.74	47.19	38.31	6.85	0.47	0.00	0.02	0.00	0.21	0.17	0.21	0.30	97.21
2007M_LK_2003-02_Pt-1028_Gr-03	till	CHR	spinel_chromite	0.02	3.13	0.74	47.25	38.39	6.81	0.46	0.00	0.00	0.00	0.26	0.18	0.20	0.28	97.44
2007M_LK_2003-04_Pt-0015_Gr-01_1st	till	CPX	clinopyroxene_chromian diopside	53.87	0.02	0.61	3.33	2.35	15.18	0.10	20.34	2.12	0.00					97.92
2007M_LK_2003-04_Pt-0016_Gr-02	till	CPX	amphibole_edenite	48.45	0.04	8.32	2.03	2.29	20.38	0.06	10.56	3.43	0.90					96.47
2007M_LK_2003-04_Pt-0017_Gr-03	till	CPX	amphibole_edenite	45.20	0.09	11.50	1.98	2.55	19.05	0.06	11.24	2.80	1.12					95.59
2007M_LK_2003-04_Pt-0018_Gr-04	till	CPX	amphibole_edenite	46.69	0.18	9.80	1.85	3.10	19.49	0.05	10.18	3.62	0.60					95.57
2007M_LK_2003-04_Pt-0019_Gr-05	till	CPX	amphibole_edenite	46.53	0.29	9.44	1.59	3.15	19.60	0.05	11.44	2.43	1.02					95.54
2007M_LK_2003-04_Pt-0020_Gr-06	till	CPX	amphibole_pargasite	45.09	0.11	11.84	1.93	2.48	19.16	0.05	11.49	2.63	1.10					95.88
2007M_LK_2003-04_Pt-0021_Gr-07	till	CPX	clinopyroxene_chromian diopside	53.70	0.08	1.71	0.86	3.00	16.15	0.11	22.56	0.74	0.01					98.93
2007M_LK_2003-04_Pt-0022_Gr-08	till	CPX	clinopyroxene_chromian diopside	53.02	0.05	1.41	0.86	5.61	13.41	0.37	23.95	0.49	0.02					99.20
2007M_LK_2003-04_Pt-0023_Gr-09	till	CPX	amphibole_pargasite	44.53	0.32	12.41	1.51	2.97	18.60	0.04	12.11	2.27	1.22					95.98
2007M_LK_2003-06_Pt-2002_Gr-ECL01	till	ECL	garnet_almandine_G3	37.76	0.12	21.71	0.06	26.05	6.51	0.79	6.85	0.00	0.00	0.00	0.00	0.10		99.92
2007M_LK_2004-03_Pt-0052_Gr-01	till	CPX	clinopyroxene_chromian diopside	51.27	0.04	3.96	0.50	4.59	14.68	0.12	23.66	0.54	0.02	0.00				99.39
2007M_LK_2004-03_Pt-0053_Gr-02	till	CPX	clinopyroxene_diopside	53.40	0.00	1.21	0.12	3.90	15.56	0.11	23.64	1.03	0.02	0.03				99.03
2007M_LK_2004-03_Pt-0089_Gr-01	till	AMP/DI	clinopyroxene_chromian diopside	51.77	0.30	7.17	0.51	2.97	14.64	0.06	19.82	2.30	0.00	0.11				99.65
2007M_LK_2004-03_Pt-0090_Gr-02	till	AMP/DI	clinopyroxene_chromian diopside	53.42	0.00	1.72	0.78	2.87	15.85	0.10	23.31	1.03	0.00	0.03				99.11
2021M_LK_2003-06_Pt-2030_Gr-TOUR01	till	TOUR	amphibole_magnesiohornblende	50.65	0.14	5.51	0.18	11.47	15.50	0.34	11.81	0.80	0.44	0.02	0.01	0.09		96.93
2021M_LK_2003-06_Pt-2031_Gr-TOUR02	till	TOUR	tourmaline	35.41	0.87	34.66	0.00	8.21	5.32	0.04	0.48	2.01	0.04	0.00	0.00	0.09		87.10
2021M_LK_2003-06_Pt-2032_Gr-TOUR03	till	TOUR	tourmaline	35.91	0.56	34.47	0.04	6.01	7.06	0.03	1.03	1.84	0.06	0.14	0.02	0.03		87.19
2021M_LK_2003-06_Pt-2033_Gr-TOUR04	till	TOUR	tourmaline	35.36	0.93	34.50	0.00	7.47	5.69	0.00	0.97	1.84	0.05	0.01	0.09	0.01		86.92
2021M_LK_2003-06_Pt-2034_Gr-TOUR05	till	TOUR	tourmaline	35.61	0.16	36.55	0.00	11.38	2.34	0.14	0.11	1.40	0.04	0.00	0.09	0.09		87.88
2021M_LK_2004-03_Pt-0040_Gr-01	till	ECL	garnet_pyrope_G9	40.96	0.24	22.37	1.74	8.13	20.93	0.35	4.32	0.09	0.01	0.06				99.20
2022M_LK_2003-02_Pt-0033_Gr-01	glaciofluvial sand	PYR-DEF	garnet_pyrope_G9	41.32	0.02	20.51	3.96	7.91	19.28	0.48	5.72	0.00	0.02	0.00	0.02			99.24
2022M_LK_2003-02_Pt-0034_Gr-02	glaciofluvial sand	PYR-DEF	garnet_pyrope_G9	41.61	0.13	19.94	3.76	8.47	19.78	0.49	5.04	0.03	0.00	0.03	0.01			99.28

Grain_ID	Grain Source	Picked As	Mineral (Post-Probe)	SiO2	TiO2	Al2O3	Cr2O3	FeO	MgO	MnO	CaO	Na2O	K2O	NiO	ZnO	Nb2O5	V2O5	Total
2022M_LK_2003-02_Pt-0035_Gr-03	glaciofluvial sand	PYR-DEF	garnet_pyrope_G9	41.84	0.14	19.26	4.75	8.30	19.62	0.41	5.31	0.01	0.04	0.00	0.00			99.68
2022M_LK_2003-02_Pt-0036_Gr-04	glaciofluvial sand	PYR-DEF	garnet_pyrope_G9	41.82	0.04	20.61	3.16	8.36	19.79	0.53	5.07	0.01	0.06	0.01	0.00			99.46
2022M_LK_2003-02_Pt-0037_Gr-05	glaciofluvial sand	PYR-DEF	garnet_pyrope_G9	41.49	0.00	20.24	3.52	8.49	19.14	0.54	5.50	0.01	0.00	0.01	0.01			98.96
2022M_LK_2003-02_Pt-0038_Gr-06	glaciofluvial sand	PYR-DEF	garnet_pyrope_G9	40.93	0.02	17.60	6.69	8.52	17.96	0.55	6.86	0.00	0.00	0.00	0.02			99.15
2022M_LK_2003-02_Pt-0039_Gr-07	glaciofluvial sand	PYR-DEF	garnet_pyrope_G9	41.45	0.10	19.15	5.09	7.49	20.23	0.42	5.04	0.04	0.00	0.00	0.02			99.03
2022M_LK_2003-02_Pt-0040_Gr-08	glaciofluvial sand	PYR-DEF	garnet_pyrope_G9	41.46	0.14	19.30	4.42	8.73	19.15	0.46	5.34	0.03	0.00	0.00	0.00			99.02
2022M_LK_2003-02_Pt-0041_Gr-09	glaciofluvial sand	PYR-DEF	garnet_pyrope_G9	41.51	0.02	19.01	5.25	7.44	19.78	0.49	5.72	0.04	0.00	0.00	0.02			99.27
2022M_LK_2003-02_Pt-0042_Gr-10	glaciofluvial sand	PYR-DEF	garnet_pyrope_G9	41.60	0.11	20.58	2.88	8.67	19.85	0.41	4.93	0.01	0.01	0.01	0.00			99.06
2022M_LK_2003-02_Pt-0043_Gr-11	glaciofluvial sand	PYR-DEF	garnet_pyrope_G9	41.94	0.27	18.60	4.74	7.53	20.70	0.36	4.99	0.07	0.00	0.00	0.02			99.21
2022M_LK_2003-02_Pt-0044_Gr-12	glaciofluvial sand	PYR-DEF	garnet_pyrope_G9	41.32	0.00	17.77	6.73	8.33	18.32	0.51	6.64	0.02	0.00	0.00	0.00			99.66
2022M_LK_2004-03_Pt-0041_Gr-01	glaciofluvial sand	ECL	garnet_pyrope_G4	40.06	0.22	23.71	0.00	15.45	16.47	0.36	3.40	0.09	0.00	0.00				99.76
2022M_LK_2004-03_Pt-0054_Gr-01	glaciofluvial sand	CPX	clinopyroxene_chromian diopside	51.54	0.17	6.60	0.85	2.47	14.63	0.06	20.73	2.15	0.01	0.07				99.28
2022M_LK_2004-03_Pt-0055_Gr-01	glaciofluvial sand	CPX	clinopyroxene_chromian diopside	53.28	0.10	2.51	0.78	3.02	15.54	0.05	23.03	0.90	0.00	0.04				99.24
2023M_LK_2004-03_Pt-0056_Gr-01	till	CPX	garnet_Cr-grossular	36.45	0.09	14.45	10.02	11.50	0.58	3.37	23.20	0.02	0.00	0.00				99.67
2023M_LK_2004-03_Pt-0091_Gr-01	till	OLI	olivine_forsterite	40.33	0.00	0.00	0.00	9.46	48.80	0.13	0.04	0.02	0.02	0.39				99.18
2023M_LK_2004-03_Pt-0092_Gr-02	till	OLI	olivine_forsterite	40.49	0.00	0.00	0.00	9.91	47.97	0.08	0.07	0.08	0.01	0.40				99.01
2023M_LK_2004-03_Pt-0093_Gr-03	till	OLI	olivine_forsterite	40.00	0.00	0.00	0.00	11.15	47.49	0.13	0.00	0.01	0.02	0.42				99.21
2023M_LK_2004-03_Pt-0094_Gr-04	till	OLI	olivine_forsterite	40.40	0.00	0.00	0.00	8.46	49.75	0.05	0.00	0.02	0.00	0.45				99.14
2023M_LK_2004-03_Pt-0095_Gr-05	till	OLI	olivine_forsterite	40.35	0.00	0.00	0.00	10.23	47.95	0.04	0.00	0.05	0.00	0.41				99.03
2023M_LK_2004-03_Pt-0096_Gr-06	till	OLI	olivine_forsterite	40.63	0.00	0.00	0.00	8.42	49.43	0.10	0.02	0.02	0.00	0.42				99.04
2023M_LK_2004-03_Pt-0097_Gr-07	till	OLI	olivine_forsterite	40.33	0.00	0.00	0.00	8.64	49.48	0.06	0.00	0.02	0.01	0.48				99.03
2023M_LK_2004-03_Pt-0098_Gr-08	till	OLI	olivine_forsterite	39.15	0.00	0.00	0.00	8.77	48.23	0.07	0.03	0.00	0.00	0.34				96.58
2023M_LK_2004-03_Pt-0099_Gr-09	till	OLI	olivine_forsterite	40.52	0.00	0.00	0.00	8.68	49.19	0.09	0.05	0.04	0.00	0.46				99.02
2023M_LK_2004-03_Pt-0100_Gr-10	till	OLI	olivine_forsterite	40.47	0.00	0.00	0.00	9.78	48.58	0.10	0.00	0.03	0.00	0.44				99.40
2024M_LK_2003-02_Pt-0045_Gr-01	till	PYR-POS	garnet_pyrope_G9	41.92	0.28	20.41	3.02	8.34	20.07	0.48	4.84	0.03	0.04	0.01	0.02			99.45
2024M_LK_2003-02_Pt-1029_Gr-01	till	CHR	spinel_chromite	0.05	0.79	8.02	37.91	39.99	11.44	0.30	0.00	0.00	0.00	0.29	0.02	0.24	0.06	99.07
2024M_LK_2003-02_Pt-1030_Gr-02	till	CHR	spinel_chromite	0.06	0.78	7.89	37.75	39.40	11.13	0.27	0.00	0.00	0.00	0.30	0.04	0.23	0.08	97.84
2106M_LK_2003-02_Pt-0046_Gr-01	till	PYR-POS	garnet_pyrope_G9	40.97	0.26	20.91	3.24	8.87	19.89	0.40	4.71	0.06	0.00	0.00	0.00			99.31
2106M_LK_2003-02_Pt-0047_Gr-02	till	PYR-POS	garnet_pyrope_G1	41.61	0.39	20.16	3.29	7.63	20.95	0.44	4.44	0.04	0.00	0.00	0.00			98.95
2106M_LK_2003-02_Pt-0048_Gr-03	till	PYR-POS	garnet_pyrope_G9	41.65	0.37	19.36	4.20	8.04	20.12	0.46	4.91	0.05	0.00	0.01	0.00			99.17
2106M_LK_2003-02_Pt-0049_Gr-04	till	PYR-POS	garnet_pyrope_G9	41.86	0.00	20.04	4.07	7.58	19.83	0.53	5.52	0.03	0.01	0.01	0.04			99.52
2106M_LK_2003-02_Pt-0050_Gr-05	till	PYR-POS	garnet_pyrope_G9	41.88	0.00	19.42	4.77	7.47	19.65	0.49	5.86	0.04	0.00	0.02	0.00			99.60
2106M_LK_2003-02_Pt-0051_Gr-06	till	PYR-POS	garnet_pyrope_G9	41.70	0.10	20.23	3.69	8.22	18.98	0.60	6.24	0.04	0.00	0.00	0.00			99.79
2106M_LK_2003-02_Pt-0052_Gr-01	till	PYR-DEF	garnet_pyrope_G9	41.38	0.05	19.77	4.12	8.25	19.62	0.47	5.36	0.02	0.00	0.01	0.00			99.05
2106M_LK_2003-02_Pt-0053_Gr-02	till	PYR-DEF	garnet_pyrope_G9	41.34	0.05	18.58	5.83	7.73	18.71	0.50	6.27	0.04	0.00	0.00	0.00			99.04
2106M_LK_2003-02_Pt-0054_Gr-03	till	PYR-DEF	garnet_pyrope_G9	41.78	0.03	20.13	3.55	8.44	19.59	0.56	5.33	0.01	0.05	0.01	0.01			99.48
2106M_LK_2003-02_Pt-0055_Gr-04	till	PYR-DEF	garnet_pyrope_G9	41.33	0.02	18.59	5.69	7.34	19.16	0.44	6.23	0.02	0.00	0.00	0.01			98.82
2106M_LK_2003-02_Pt-0144_Gr-01	till	CPX-POS	clinopyroxene_chromian diopside	55.00	0.04	2.67	3.42	2.00	14.73	0.08	18.80	2.64	0.02	0.02	0.00			99.41

Grain_ID	Grain Source	Picked As	Mineral (Post-Probe)	SiO2	TiO2	Al2O3	Cr2O3	FeO	MgO	MnO	CaO	Na2O	K2O	NiO	ZnO	Nb2O5	V2O5	Total
2106M_LK_2003-02_Pt-0145_Gr-02	till	CPX-POS	clinopyroxene_chromian diopside	55.29	0.02	2.60	3.17	2.01	14.89	0.07	18.56	2.65	0.03	0.03	0.00			99.32
2106M_LK_2003-02_Pt-1031_Gr-01	till	CHR	spinel_chromite	0.01	1.52	0.62	50.66	37.69	5.93	0.56	0.00	0.01	0.00	0.19	0.19	0.19	0.19	97.58
2106M_LK_2003-02_Pt-1032_Gr-02	till	CHR	spinel_chromite	0.02	1.20	0.95	57.55	30.55	7.20	0.54	0.01	0.04	0.00	0.14	0.18	0.17	0.25	98.55
2106M_LK_2003-02_Pt-1033_Gr-03	till	CHR	spinel_chromite	0.02	1.28	1.36	45.14	41.02	7.84	0.40	0.00	0.00	0.00	0.28	0.07	0.25	0.20	97.65
2106M_LK_2004-03_Pt-0042_Gr-01	till	ECL	garnet_pyrope_G4	38.73	0.05	22.94	0.34	17.46	13.28	0.65	5.99	0.05	0.01	0.00				99.51
2107M_LK_2003-02_Pt-0056_Gr-01	till	PYR-POS	garnet_pyrope_G9	41.60	0.05	20.65	2.95	8.83	19.65	0.52	4.79	0.00	0.01	0.02	0.04			99.10
2107M_LK_2003-02_Pt-0057_Gr-02	till	PYR-POS	garnet_pyrope_G9	41.24	0.09	20.52	3.63	8.26	19.72	0.52	5.03	0.04	0.01	0.00	0.06			99.11
2107M_LK_2003-02_Pt-0058_Gr-03	till	PYR-POS	garnet_pyrope_G9	41.51	0.17	19.57	4.37	8.14	19.76	0.44	5.22	0.03	0.00	0.00	0.01			99.22
2107M_LK_2003-02_Pt-0059_Gr-04	till	PYR-POS	garnet_pyrope_G9	40.92	0.04	19.95	4.12	8.83	18.52	0.65	5.88	0.02	0.00	0.00	0.00			98.93
2107M_LK_2003-02_Pt-0060_Gr-01	till	PYR-DEF	garnet_pyrope_G9	41.28	0.04	18.80	5.66	8.07	18.76	0.54	6.05	0.00	0.03	0.00	0.06			99.28
2107M_LK_2003-02_Pt-0061_Gr-02	till	PYR-DEF	garnet_pyrope_G9	40.73	0.01	17.94	6.67	7.97	17.98	0.53	6.99	0.00	0.00	0.05	0.00			98.88
2107M_LK_2003-02_Pt-0062_Gr-03	till	PYR-DEF	garnet_pyrope_G9	41.10	0.01	17.62	7.17	7.94	17.80	0.54	7.14	0.01	0.00	0.04	0.00			99.37
2107M_LK_2003-02_Pt-0063_Gr-04	till	PYR-DEF	garnet_pyrope_G9	41.48	0.03	19.50	4.92	7.87	19.67	0.51	5.53	0.01	0.06	0.03	0.00			99.61
2107M_LK_2003-02_Pt-0064_Gr-05	till	PYR-DEF	garnet_pyrope_G9	40.79	0.00	17.29	7.39	8.02	17.97	0.52	7.04	0.00	0.01	0.00	0.00			99.04
2107M_LK_2004-03_Pt-0057_Gr-01	till	CPX	clinopyroxene_chromian diopside	51.53	0.17	5.47	1.06	2.24	14.76	0.04	22.73	1.55	0.00	0.01				99.57
2107M_LK_2004-03_Pt-0058_Gr-01	till	CPX	clinopyroxene_chromian diopside	52.36	0.00	1.99	0.68	5.37	14.38	0.19	22.99	1.00	0.01	0.08				99.06
2109M_LK_2004-03_Pt-0059_Gr-01	till	CPX	clinopyroxene_chromian diopside	52.87	0.00	2.91	0.99	3.42	15.14	0.10	22.03	1.63	0.00	0.05				99.14
2151M_LK_2004-03_Pt-0164_Gr-01	till	CPX	clinopyroxene_chromian diopside	51.58	0.00	4.23	0.92	2.53	16.17	0.07	22.56	0.92	0.01	0.05				99.03
2154M_LK_2003-02_Pt-0065_Gr-01	till	PYR	garnet_pyrope_G9	40.77	0.09	16.96	7.38	8.34	18.21	0.54	6.96	0.00	0.00	0.00	0.00			99.24
2154M_LK_2004-03_Pt-0165_Gr-01	till	CPX	amphibole_magnesiohornblende	50.77	0.00	5.93	1.42	3.82	19.86	0.04	11.89	1.40	0.48	0.37				95.98
2155M_LK_2004-03_Pt-0166_Gr-01	till	CPX	clinopyroxene_chromian diopside	51.14	0.00	4.42	0.41	6.31	14.12	0.16	22.14	1.29	0.00	0.10				100.10
2501M_LK_2004-03_Pt-0167_Gr-01	till	CPX	clinopyroxene_chromian diopside	53.01	0.00	1.57	0.55	3.73	15.79	0.12	23.66	0.73	0.00	0.08				99.24
2502M_LK_2003-02_Pt-0066_Gr-02	till	PYR-DEF	garnet_pyrope_G9	41.85	0.04	20.32	3.35	8.24	20.47	0.41	4.82	0.02	0.04	0.02	0.00			99.57
2502M_LK_2003-02_Pt-0067_Gr-03	till	PYR-DEF	garnet_pyrope_G9	40.91	0.20	18.19	6.44	8.15	18.90	0.49	5.64	0.02	0.00	0.01	0.00			98.94
2502M_LK_2004-03_Pt-0168_Gr-01	till	CPX	clinopyroxene_chromian diopside	52.01	0.06	6.17	1.04	2.46	15.04	0.16	20.71	1.60	0.03	0.00				99.27
2502M_LK_2004-03_Pt-0169_Gr-02	till	CPX	clinopyroxene_chromian diopside	53.21	0.12	2.43	1.20	4.22	14.89	0.05	22.64	1.37	0.02	0.04				100.19
2502M_LK_2004-03_Pt-0170_Gr-03	till	CPX	clinopyroxene_chromian diopside	53.32	0.11	2.36	1.10	4.21	15.03	0.05	22.35	1.04	0.00	0.10				99.66
2503M_LK_2004-03_Pt-0043_Gr-01	till	ECL	garnet_pyrope_G4	40.33	0.30	23.65	0.02	11.89	19.08	0.37	3.59	0.11	0.03	0.02				99.39
2503M_LK_2004-03_Pt-0171_Gr-01	till	CPX	clinopyroxene_chromian diopside	53.60	0.00	1.10	0.40	2.66	16.23	0.07	24.26	0.74	0.00	0.19				99.25
2504M_LK_2003-06_Pt-2003_Gr-ECL01	till	ECL	garnet_almandine_G3	37.69	0.18	21.06	0.00	26.70	4.93	0.89	8.57	0.00	0.00	0.00	0.05	0.14		100.17
2504M_LK_2003-06_Pt-2004_Gr-OLV01	till	OLV	olivine_forsterite	41.01	0.02	0.03	0.01	10.50	48.09	0.14	0.05	0.03	0.00	0.35	0.00	0.07		100.28
2504M_LK_2003-06_Pt-2005_Gr-OLV02	till	OLV	olivine_forsterite	40.88	0.03	0.08	0.06	10.05	48.12	0.13	0.09	0.05	0.00	0.35	0.00	0.07		99.89
2504M_LK_2003-06_Pt-2006_Gr-OLV03	till	OLV	olivine_forsterite	40.95	0.03	0.02	0.02	9.82	48.55	0.10	0.09	0.06	0.00	0.40	0.12	0.06		100.20
2504M_LK_2003-06_Pt-2007_Gr-OLV04	till	OLV	olivine_forsterite	41.00	0.02	0.03	0.03	9.71	48.68	0.10	0.04	0.02	0.00	0.38	0.00	0.11		100.09
2505M_LK_2003-04_Pt-0024_Gr-01	till	CPX	clinopyroxene_chromian augite	53.24	0.14	2.47	1.19	4.57	17.98	0.15	18.80	0.54	0.02					99.10
2505M_LK_2003-04_Pt-0025_Gr-02	till	CPX	clinopyroxene_chromian augite	53.72	0.12	1.74	0.89	4.98	19.02	0.16	18.01	0.42	0.01					99.06
2505M_LK_2003-04_Pt-0026_Gr-03	till	CPX	clinopyroxene_chromian augite	52.03	0.16	2.41	1.36	5.26	17.83	0.16	17.59	0.53	0.02					97.34
2505M_LK_2003-04_Pt-0027_Gr-04	till	CPX	clinopyroxene_chromian augite	52.35	0.15	2.34	1.37	4.63	18.21	0.16	18.36	0.55	0.01					98.11

Grain_ID	Grain Source	Picked As	Mineral (Post-Probe)	SiO2	TiO2	Al2O3	Cr2O3	FeO	MgO	MnO	CaO	Na2O	K2O	NiO	ZnO	Nb2O5	V2O5	Total
2505M_LK_2003-04_Pt-0028_Gr-05	till	CPX	clinopyroxene_chromian augite	52.86	0.11	1.76	1.05	4.74	18.87	0.18	17.94	0.41	0.01					97.93
2505M_LK_2003-04_Pt-0029_Gr-01	till	CPX	clinopyroxene_chromian augite	52.21	0.19	2.53	1.10	4.92	17.71	0.17	18.76	0.54	0.02					98.15
2505M_LK_2003-04_Pt-0030_Gr-02	till	CPX	clinopyroxene_chromian augite	51.80	0.18	2.37	1.35	5.00	17.98	0.15	17.35	0.62	0.02					96.82
2505M_LK_2003-06_Pt-2029_Gr-CHR01	till	CHR	spinel_chromite	0.11	4.45	8.09	47.32	26.31	11.57	0.35	0.02	0.00	0.01	0.23	0.18	0.16		98.75
2509M_LK_2004-03_Pt-0101_Gr-01	till	OLI	olivine_forsterite	40.57	0.00	0.00	0.00	8.75	49.31	0.08	0.02	0.03	0.01	0.41				99.18
2509M_LK_2004-03_Pt-0102_Gr-02	till	OLI	olivine_forsterite	40.58	0.00	0.00	0.00	8.09	49.82	0.09	0.00	0.02	0.00	0.44				99.04
2509M_LK_2004-03_Pt-0103_Gr-03	till	OLI	olivine_forsterite	40.83	0.00	0.00	0.00	7.98	49.82	0.09	0.01	0.00	0.01	0.45				99.19
2509M_LK_2004-03_Pt-0104_Gr-04	till	OLI	olivine_forsterite	40.82	0.00	0.00	0.00	8.02	49.73	0.09	0.00	0.02	0.02	0.48				99.17
2509M_LK_2004-03_Pt-0105_Gr-05	till	OLI	olivine_forsterite	40.20	0.00	0.00	0.00	8.90	49.26	0.08	0.00	0.06	0.04	0.48				99.02
2509M_LK_2004-03_Pt-0106_Gr-01	till	OLI	olivine_forsterite	40.27	0.00	0.00	0.00	8.18	50.03	0.09	0.00	0.03	0.01	0.45				99.06
2509M_LK_2004-03_Pt-0172_Gr-01	till	CPX	clinopyroxene_chromian diopside	51.06	0.26	6.31	0.67	2.63	14.79	0.07	21.03	2.15	0.00	0.05				99.02
2510M_LK_2004-03_Pt-0101_Gr-01	till	OLI	olivine_forsterite	39.86	0.00	0.00	0.00	9.97	48.52	0.10	0.07	0.00	0.00	0.49				99.00
2510M_LK_2004-03_Pt-0102_Gr-02	till	OLI	olivine_forsterite	40.31	0.00	0.00	0.00	8.97	49.32	0.12	0.01	0.00	0.01	0.34				99.08
2510M_LK_2004-03_Pt-0103_Gr-03	till	OLI	olivine_forsterite	40.50	0.00	0.00	0.00	8.50	49.73	0.06	0.00	0.03	0.00	0.45				99.28
2510M_LK_2004-03_Pt-0104_Gr-04	till	OLI	olivine_forsterite	40.35	0.00	0.00	0.00	8.73	49.37	0.10	0.00	0.00	0.02	0.52				99.09
2510M_LK_2004-03_Pt-0105_Gr-05	till	OLI	olivine_forsterite	40.04	0.00	0.00	0.00	10.16	48.25	0.10	0.08	0.03	0.00	0.36				99.01
2510M_LK_2004-03_Pt-0106_Gr-06	till	OLI	olivine_forsterite	40.30	0.00	0.00	0.00	8.16	49.99	0.08	0.00	0.04	0.00	0.51				99.08
2510M_LK_2004-03_Pt-0107_Gr-01	till	OLI	olivine_forsterite	40.84	0.00	0.00	0.00	7.54	50.21	0.04	0.01	0.02	0.01	0.39				99.07
2510M_LK_2004-03_Pt-0107_Gr-07	till	OLI	olivine_forsterite	40.60	0.00	0.00	0.00	9.28	49.03	0.10	0.00	0.01	0.02	0.46				99.51
2510M_LK_2004-03_Pt-0108_Gr-02	till	OLI	olivine_forsterite	40.31	0.00	0.00	0.00	8.75	49.54	0.05	0.00	0.01	0.00	0.36				99.02
2510M_LK_2004-03_Pt-0108_Gr-08	till	OLI	olivine_forsterite	40.66	0.00	0.00	0.00	9.26	49.00	0.11	0.00	0.02	0.01	0.39				99.45
2510M_LK_2004-03_Pt-0109_Gr-01	till	OLI	olivine_forsterite	39.64	0.00	0.00	0.00	11.84	46.96	0.18	0.02	0.05	0.01	0.32				99.02
2510M_LK_2004-03_Pt-0109_Gr-09	till	OLI	olivine_forsterite	40.33	0.00	0.00	0.00	9.18	48.85	0.18	0.00	0.01	0.01	0.45				99.01
2510M_LK_2004-03_Pt-0110_Gr-02	till	OLI	olivine_forsterite	39.97	0.00	0.00	0.00	8.85	49.65	0.11	0.03	0.03	0.04	0.46				99.14
2510M_LK_2004-03_Pt-0110_Gr-10	till	OLI	olivine_forsterite	40.73	0.00	0.00	0.00	8.27	49.79	0.14	0.00	0.04	0.03	0.34				99.34
2510M_LK_2004-03_Pt-0111_Gr-03	till	OLI	olivine_forsterite	39.98	0.00	0.00	0.00	8.96	49.46	0.10	0.05	0.00	0.03	0.44				99.02
2510M_LK_2004-03_Pt-0111_Gr-11	till	OLI	olivine_forsterite	40.28	0.00	0.00	0.00	9.72	48.55	0.08	0.00	0.03	0.01	0.45				99.13
2510M_LK_2004-03_Pt-0112_Gr-12	till	OLI	olivine_forsterite	40.52	0.00	0.00	0.00	8.59	49.60	0.08	0.00	0.00	0.02	0.44				99.26
2510M_LK_2004-03_Pt-0173_Gr-01	till	CPX	clinopyroxene_chromian diopside	54.65	0.00	2.86	1.04	2.99	14.75	0.07	21.10	2.15	0.02	0.11				99.74
2511M_LK_2003-02_Pt-0068_Gr-01	till	PYR-POS	garnet_pyrope_G9	41.28	0.12	19.12	4.87	8.09	19.27	0.45	5.78	0.05	0.00	0.02	0.00			99.04
2511M_LK_2003-02_Pt-0069_Gr-02	till	PYR-POS	garnet_pyrope_G9	41.05	0.03	19.30	4.76	8.56	18.91	0.55	5.74	0.02	0.01	0.00	0.01			98.96
2511M_LK_2003-02_Pt-0070_Gr-03	till	PYR-POS	garnet_pyrope_G9	41.50	0.00	19.72	4.28	8.18	19.59	0.42	5.50	0.02	0.02	0.00	0.00			99.23
2511M_LK_2003-02_Pt-0071_Gr-04	till	PYR-POS	garnet_pyrope_G9	41.93	0.09	15.51	8.78	6.79	19.86	0.32	6.40	0.02	0.01	0.03	0.01			99.75
2511M_LK_2003-02_Pt-0072_Gr-05	till	PYR-POS	garnet_pyrope_G9	42.03	0.01	19.77	4.52	7.54	19.70	0.51	5.64	0.02	0.04	0.00	0.04			99.82
2511M_LK_2003-02_Pt-0073_Gr-06	till	PYR-POS	garnet_pyrope_G9	41.32	0.02	20.82	3.12	7.89	19.97	0.59	5.21	0.02	0.00	0.01	0.02			98.98
2511M_LK_2003-02_Pt-0074_Gr-01	till	PYR-DEF	garnet_pyrope_G9	41.69	0.03	19.43	4.76	8.34	19.33	0.49	5.42	0.02	0.01	0.00	0.02			99.53
2511M_LK_2003-02_Pt-0075_Gr-02	till	PYR-DEF	garnet_pyrope_G9	41.49	0.09	19.81	4.04	9.05	18.69	0.50	5.86	0.02	0.00	0.00	0.00			99.55
2511M_LK_2003-02_Pt-0076_Gr-03	till	PYR-DEF	garnet_pyrope_G9	41.02	0.01	18.70	5.65	8.25	18.59	0.54	6.26	0.02	0.02	0.00	0.00			99.06

Grain_ID	Grain Source	Picked As	Mineral (Post-Probe)	SiO2	TiO2	Al2O3	Cr2O3	FeO	MgO	MnO	CaO	Na2O	K2O	NiO	ZnO	Nb2O5	V2O5	Total
2511M_LK_2003-02_Pt-0077_Gr-04	till	PYR-DEF	garnet_pyrope_G9	41.61	0.00	19.25	5.13	7.51	19.41	0.50	5.91	0.00	0.02	0.00	0.01			99.35
2511M_LK_2003-02_Pt-0078_Gr-05	till	PYR-DEF	garnet_pyrope_G9	41.65	0.04	19.96	4.17	7.65	19.79	0.50	5.42	0.04	0.00	0.00	0.00			99.22
2511M_LK_2003-02_Pt-0146_Gr-01	till	CPX-POS	amphibole_edenite	51.27	0.04	4.98	1.52	2.44	21.69	0.03	9.63	3.96	0.77	0.12	0.00			96.86
2511M_LK_2003-02_Pt-0147_Gr-02	till	CPX-POS	amphibole_edenite	46.06	0.02	11.34	2.06	2.39	19.55	0.04	11.57	2.43	1.73	0.14	0.00			97.32
2511M_LK_2003-02_Pt-1034_Gr-01	till	CHR	spinel_magnesiochromite	0.00	0.03	21.62	44.53	20.41	11.46	0.35	0.00	0.02	0.00	0.09	0.09	0.19	0.19	98.80
2511M_LK_2003-02_Pt-1035_Gr-02	till	CHR	spinel_chromite	0.04	0.04	20.54	44.73	21.44	10.14	0.32	0.00	0.00	0.00	0.09	0.16	0.21	0.26	97.71
2511M_LK_2003-02_Pt-1036_Gr-03	till	CHR	spinel_chromite	0.02	0.09	18.03	45.93	22.44	10.36	0.31	0.00	0.02	0.01	0.15	0.19	0.21	0.23	97.76
2511M_LK_2003-02_Pt-1037_Gr-04	till	CHR	spinel_chromite	0.01	2.20	6.77	37.41	42.69	7.59	0.47	0.00	0.02	0.00	0.27	0.18	0.30	0.23	97.90
2511M_LK_2003-02_Pt-1038_Gr-05	till	CHR	spinel_magnesiochromite	0.10	1.19	15.69	48.29	19.48	12.59	0.21	0.01	0.00	0.01	0.24	0.03	0.17	0.15	97.99
2511M_LK_2003-02_Pt-1039_Gr-06	till	CHR	spinel_chromite	0.01	3.25	2.50	47.96	34.35	8.27	0.43	0.00	0.00	0.02	0.24	0.12	0.23	0.31	97.39
2512M_LK_2004-03_Pt-0112_Gr-01	till	OLI	olivine_forsterite	39.97	0.00	0.00	0.00	8.74	49.69	0.12	0.03	0.02	0.00	0.46				99.03
2512M_LK_2004-03_Pt-0113_Gr-01	till	OLI	olivine_forsterite	39.73	0.00	0.00	0.00	10.99	47.81	0.16	0.05	0.03	0.01	0.41				99.19
2512M_LK_2004-03_Pt-0114_Gr-02	till	OLI	olivine_forsterite	39.47	0.00	0.00	0.00	12.19	46.98	0.07	0.00	0.00	0.01	0.37				99.08
2513M_LK_2003-04_Pt-0031_Gr-01	till	CPX	clinopyroxene_chromian diopside	50.97	0.25	7.57	0.87	2.42	14.67	0.09	19.86	1.57	0.01					98.28
2513M_LK_2004-03_Pt-0174_Gr-01	till	CPX	clinopyroxene_chromian diopside	53.14	0.00	1.61	0.69	3.92	15.65	0.14	23.40	1.10	0.01	0.02				99.68
2515M_LK_2003-02_Pt-0148_Gr-01	till	CPX-POS	clinopyroxene_chromian diopside	55.16	0.03	2.50	1.79	1.95	16.05	0.06	20.07	1.67	0.00	0.02	0.00			99.30
2515M_LK_2003-04_Pt-0032_Gr-01	till	CPX	clinopyroxene_chromian diopside	52.60	0.10	2.12	0.88	4.43	15.21	0.16	22.55	0.49	0.00					98.54
2515M_LK_2003-04_Pt-0033_Gr-02	till	CPX	clinopyroxene_chromian diopside	54.28	0.02	2.53	1.83	1.93	15.78	0.08	20.75	1.81	0.01					99.01
2515M_LK_2003-06_Pt-2008_Gr-OLV01	till	OLV	olivine_forsterite	40.97	0.03	0.03	0.02	9.69	49.26	0.11	0.04	0.01	0.00	0.32	0.08	0.03		100.58
2515M_LK_2003-06_Pt-2009_Gr-OLV02	till	OLV	olivine_forsterite	40.88	0.04	0.00	0.08	8.62	49.33	0.17	0.03	0.01	0.00	0.36	0.06	0.09		99.64
2515M_LK_2003-06_Pt-2010_Gr-OLV03	till	OLV	olivine_forsterite	40.95	0.00	0.01	0.06	9.37	49.31	0.14	0.05	0.03	0.00	0.37	0.01	0.07		100.35
2515M_LK_2003-06_Pt-2011_Gr-OLV04	till	OLV	olivine_forsterite	41.16	0.01	0.04	0.04	8.97	49.44	0.11	0.05	0.03	0.00	0.42	0.00	0.06		100.31
2515M_LK_2003-06_Pt-2012_Gr-OLV05	till	OLV	olivine_forsterite	40.94	0.04	0.01	0.01	9.11	48.76	0.14	0.08	0.05	0.00	0.27	0.00	0.04		99.44
2515M_LK_2003-06_Pt-2013_Gr-OLV06	till	OLV	olivine_forsterite	41.14	0.01	0.00	0.00	8.87	49.32	0.11	0.04	0.01	0.00	0.35	0.02	0.10		99.94
2516M_LK_2003-02_Pt-0079_Gr-01	till	PYR-POS	garnet_pyrope_G9	41.51	0.04	21.41	2.64	8.09	19.45	0.57	5.33	0.00	0.00	0.02	0.01			99.07
2516M_LK_2003-02_Pt-0080_Gr-02	till	PYR-POS	garnet_pyrope_G9	41.54	0.01	20.85	2.86	8.21	19.43	0.56	5.44	0.03	0.00	0.01	0.02			98.96
2516M_LK_2003-02_Pt-0081_Gr-03	till	PYR-POS	garnet_pyrope_G9	41.54	0.01	21.01	2.89	8.24	20.00	0.68	5.11	0.00	0.03	0.00	0.01			99.52
2516M_LK_2003-02_Pt-0082_Gr-04	till	PYR-POS	garnet_pyrope_G9	41.75	0.00	20.42	3.62	7.50	20.13	0.52	5.32	0.02	0.00	0.01	0.00			99.29
2516M_LK_2003-02_Pt-0083_Gr-05	till	PYR-POS	garnet_pyrope_G9	41.32	0.01	21.08	2.76	8.24	19.58	0.55	5.45	0.00	0.00	0.02	0.00			99.01
2516M_LK_2003-02_Pt-0084_Gr-01	till	PYR-DEF	garnet_pyrope_G9	40.93	0.15	16.06	8.56	7.87	18.15	0.46	6.82	0.01	0.02	0.01	0.00			99.04
2516M_LK_2003-02_Pt-0085_Gr-02	till	PYR-DEF	garnet_pyrope_G9	41.65	0.01	20.97	2.86	8.31	19.67	0.59	5.42	0.01	0.03	0.01	0.00			99.53
2516M_LK_2003-02_Pt-0086_Gr-03	till	PYR-DEF	garnet_pyrope_G9	41.75	0.02	19.70	4.56	7.50	20.13	0.54	5.38	0.01	0.00	0.00	0.01			99.60
2516M_LK_2003-02_Pt-0087_Gr-04	till	PYR-DEF	garnet_pyrope_G9	41.85	0.02	19.66	4.65	7.94	19.34	0.50	5.84	0.04	0.00	0.01	0.00			99.85
2516M_LK_2003-02_Pt-0088_Gr-05	till	PYR-DEF	garnet_pyrope_G9	41.92	0.00	20.76	2.92	8.60	19.67	0.50	5.01	0.01	0.00	0.00	0.01			99.41
2516M_LK_2003-02_Pt-0089_Gr-06	till	PYR-DEF	garnet_pyrope_G9	41.22	0.03	19.13	5.19	7.38	19.72	0.55	5.86	0.04	0.01	0.02	0.00			99.15
2516M_LK_2003-02_Pt-0149_Gr-01	till	CPX-POS	clinopyroxene_chromian augite	54.95	0.13	2.26	1.46	2.37	16.65	0.10	19.87	1.49	0.00	0.04	0.04			99.35
2516M_LK_2003-02_Pt-1003_Gr-01	till	ILM	spinel_chromite	0.02	2.06	0.28	44.25	44.62	5.66	0.67	0.00	0.00	0.00	0.12	0.15	0.32	0.29	98.15
2516M_LK_2003-02_Pt-1040_Gr-01	till	CHR	ilmenite (low Mg)	0.02	50.65	0.04	0.00	45.24	0.05	2.21	0.00	0.00	0.01	0.00	0.12	0.45	0.23	98.77

Grain_ID	Grain Source	Picked As	Mineral (Post-Probe)	SiO2	TiO2	Al2O3	Cr2O3	FeO	MgO	MnO	CaO	Na2O	K2O	NiO	ZnO	Nb2O5	V2O5	Total
2516M_LK_2003-02_Pt-1041_Gr-02	till	CHR	spinel_chromite	0.04	0.56	15.40	38.29	29.34	12.30	0.40	0.00	0.00	0.07	0.38	0.19	0.21	0.12	97.18
2516M_LK_2003-02_Pt-1042_Gr-03	till	CHR	spinel_chromite	0.02	2.64	3.01	44.39	40.33	7.19	0.44	0.01	0.02	0.00	0.21	0.19	0.19	0.39	98.63
2516M_LK_2004-03_Pt-0060_Gr-01	till	CPX	clinopyroxene_chromian diopside	53.63	0.00	1.05	1.07	2.42	16.10	0.08	23.24	1.44	0.01	0.07				99.12
2516M_LK_2004-03_Pt-0061_Gr-02	till	CPX	clinopyroxene_chromian diopside/ omphacite	53.47	0.12	2.91	0.76	2.77	15.28	0.02	20.61	3.13	0.03	0.08				99.18
2516M_LK_2004-03_Pt-0115_Gr-01	till	OLI	olivine_forsterite	40.31	0.00	0.00	0.00	8.54	49.71	0.08	0.04	0.04	0.00	0.47				99.19
2516M_LK_2004-03_Pt-0116_Gr-02	till	OLI	olivine_forsterite	40.36	0.00	0.00	0.00	8.88	49.39	0.08	0.05	0.06	0.05	0.43				99.30
2516M_LK_2004-03_Pt-0117_Gr-03	till	OLI	olivine_forsterite	40.29	0.00	0.00	0.00	9.23	49.03	0.06	0.06	0.03	0.02	0.39				99.10
2516M_LK_2004-03_Pt-0118_Gr-04	till	OLI	olivine_forsterite	40.82	0.00	0.00	0.00	8.11	49.72	0.06	0.07	0.03	0.05	0.49				99.35
2516M_LK_2004-03_Pt-0119_Gr-05	till	OLI	olivine_forsterite	40.17	0.00	0.00	0.00	8.97	49.34	0.09	0.03	0.03	0.01	0.42				99.07
2516M_LK_2004-03_Pt-0120_Gr-06	till	OLI	olivine_forsterite	40.25	0.00	0.00	0.00	8.42	49.84	0.10	0.00	0.01	0.02	0.47				99.11
2516M_LK_2004-03_Pt-0121_Gr-07	till	OLI	olivine_forsterite	39.99	0.00	0.00	0.00	9.73	48.54	0.08	0.11	0.09	0.00	0.52				99.05
2516M_LK_2004-03_Pt-0122_Gr-08	till	OLI	olivine_forsterite	40.41	0.00	0.00	0.00	9.37	48.88	0.08	0.03	0.04	0.02	0.40				99.23
2516M_LK_2004-03_Pt-0123_Gr-09	till	OLI	olivine_forsterite	40.55	0.00	0.00	0.00	8.77	49.34	0.06	0.03	0.04	0.03	0.44				99.27
2516M_LK_2004-03_Pt-0124_Gr-10	till	OLI	olivine_forsterite	41.04	0.00	0.00	0.00	8.54	50.14	0.00	0.00	0.00	0.00	0.48				100.20
2517M_LK_2003-02_Pt-0090_Gr-01	till	PYR-POS	garnet_pyrope_G9	41.24	0.10	18.94	5.17	8.19	19.17	0.48	5.68	0.00	0.01	0.00	0.00			98.98
2517M_LK_2003-02_Pt-0091_Gr-02	till	PYR-POS	garnet_pyrope_G9	41.52	0.04	20.58	3.31	7.80	19.83	0.52	5.45	0.01	0.00	0.00	0.00			99.06
2517M_LK_2003-02_Pt-0092_Gr-03	till	PYR-POS	garnet_pyrope_G9	41.35	0.02	20.08	4.09	7.82	19.45	0.53	5.59	0.03	0.00	0.00	0.04			99.00
2517M_LK_2003-02_Pt-0093_Gr-04	till	PYR-POS	garnet_pyrope_G9	41.99	0.00	20.11	3.99	7.64	20.19	0.54	5.45	0.00	0.01	0.00	0.03			99.95
2517M_LK_2003-02_Pt-0094_Gr-05	till	PYR-POS	garnet_pyrope_G9	41.59	0.02	20.03	4.27	8.05	19.69	0.54	5.57	0.02	0.02	0.00	0.00			99.79
2517M_LK_2003-02_Pt-0095_Gr-06	till	PYR-POS	garnet_pyrope_G9	41.64	0.15	20.36	3.72	8.56	20.00	0.45	4.92	0.02	0.01	0.00	0.00			99.83
2517M_LK_2003-02_Pt-0096_Gr-01	till	PYR-DEF	garnet_pyrope_G9	41.08	0.05	17.06	8.11	7.45	18.75	0.48	6.90	0.00	0.00	0.01	0.00			99.89
2517M_LK_2003-02_Pt-0097_Gr-02	till	PYR-DEF	garnet_pyrope_G9	41.61	0.00	19.84	4.53	7.73	19.53	0.51	5.52	0.04	0.01	0.00	0.00			99.32
2517M_LK_2003-02_Pt-0098_Gr-03	till	PYR-DEF	garnet_pyrope_G9	41.62	0.01	20.48	3.13	8.89	19.41	0.56	5.15	0.00	0.00	0.00	0.00			99.25
2517M_LK_2003-02_Pt-0099_Gr-04	till	PYR-DEF	garnet_pyrope_G9	41.57	0.04	21.07	2.84	9.13	19.51	0.53	5.16	0.00	0.06	0.00	0.00			99.91
2517M_LK_2003-02_Pt-0100_Gr-05	till	PYR-DEF	garnet_pyrope_G9	40.56	0.17	17.55	6.94	8.68	18.50	0.53	6.10	0.02	0.00	0.01	0.00			99.05
2517M_LK_2003-02_Pt-0101_Gr-06	till	PYR-DEF	garnet_pyrope_G9	41.30	0.01	19.70	4.53	8.07	18.67	0.56	6.19	0.01	0.00	0.04	0.00			99.07
2517M_LK_2003-02_Pt-0102_Gr-07	till	PYR-DEF	garnet_pyrope_G9	41.15	0.01	18.82	5.50	8.06	18.70	0.49	6.20	0.02	0.02	0.00	0.02			98.99
2517M_LK_2003-02_Pt-1043_Gr-01	till	CHR	ilmenite (low Mg)	0.23	52.94	0.09	0.01	40.81	0.05	1.68	0.01	0.00	0.00	0.00	0.12	0.30	0.34	96.24
2517M_LK_2003-02_Pt-1044_Gr-02	till	CHR	spinel_magnesiochromite	0.06	0.03	11.16	57.74	17.30	11.60	0.29	0.01	0.00	0.01	0.08	0.11	0.14	0.33	98.54
2517M_LK_2003-02_Pt-1045_Gr-03	till	CHR	spinel_chromite	0.03	1.81	2.79	53.32	30.27	8.07	0.52	0.00	0.00	0.01	0.17	0.19	0.24	0.15	97.41
2517M_LK_2004-03_Pt-0062_Gr-01	till	CPX	clinopyroxene_diopside	53.76	0.00	1.20	0.09	3.90	15.32	0.24	23.68	0.74	0.04	0.05				99.02
2517M_LK_2004-03_Pt-0063_Gr-02	till	CPX	clinopyroxene_diopside	53.08	0.00	1.35	0.10	5.46	15.20	0.15	23.56	0.69	0.03	0.05				99.68
2519M_LK_2004-03_Pt-0064_Gr-01	till	CPX	clinopyroxene_chromian diopside	53.94	0.00	0.11	2.95	2.01	15.72	0.05	21.86	2.33	0.04	0.05				99.06
2520M_LK_2004-03_Pt-0125_Gr-01	till	OLI	olivine_forsterite	40.88	0.00	0.00	0.00	9.98	47.81	0.07	0.02	0.03	0.00	0.45				99.24
2520M_LK_2004-03_Pt-0126_Gr-02	till	OLI	olivine_forsterite	40.85	0.00	0.00	0.00	7.86	49.82	0.09	0.04	0.04	0.01	0.41				99.11
2520M_LK_2004-03_Pt-0127_Gr-01	till	OLI	olivine_forsterite	40.32	0.00	0.00	0.00	8.56	49.85	0.05	0.00	0.04	0.01	0.47				99.29
2520M_LK_2004-03_Pt-0129_Gr-02	till	OLI	olivine_forsterite	40.23	0.00	0.00	0.00	9.21	49.18	0.10	0.00	0.07	0.00	0.41				99.20

Grain_ID	Grain Source	Picked As	Mineral (Post-Probe)	SiO2	TiO2	Al2O3	Cr2O3	FeO	MgO	MnO	CaO	Na2O	K2O	NiO	ZnO	Nb2O5	V2O5	Total
2522M_LK_2004-03_Pt-0130_Gr-01	till	OLI	olivine_forsterite	40.76	0.00	0.00	0.00	8.41	49.27	0.08	0.05	0.05	0.02	0.44				99.08
2522M_LK_2004-03_Pt-0131_Gr-02	till	OLI	olivine_forsterite	40.37	0.00	0.00	0.00	9.94	48.73	0.05	0.00	0.02	0.00	0.55				99.66
2522M_LK_2004-03_Pt-0132_Gr-41	till	OLI	olivine_forsterite	40.55	0.00	0.00	0.00	8.55	49.36	0.09	0.09	0.02	0.00	0.53				99.20
2522M_LK_2004-03_Pt-0216_Gr-01	till	CHR	spinel_chromite	0.00	0.62	13.06	51.69	24.23	10.19	0.35	0.00	0.00	0.00	0.22				100.37
2522M_LK_2004-03_Pt-0217_Gr-01	till	CHR	spinel_spinel	0.00	0.00	54.80	13.84	11.05	19.83	0.09	0.00	0.06	0.00	0.30				99.96
2523M_LK_2004-03_Pt-0133_Gr-01	till	OLI	olivine_forsterite	40.08	0.00	0.00	0.00	10.24	48.25	0.14	0.00	0.01	0.00	0.39				99.11
2523M_LK_2004-03_Pt-0134_Gr-02	till	OLI	olivine_forsterite	40.48	0.00	0.00	0.00	8.00	49.22	1.16	0.08	0.00	0.02	0.05				99.01
2523M_LK_2004-03_Pt-0135_Gr-03	till	OLI	olivine_forsterite	38.61	0.00	0.00	0.00	18.44	41.36	0.24	0.27	0.03	0.01	0.20				99.16
2523M_LK_2004-03_Pt-0136_Gr-01	till	OLI	olivine_forsterite	40.68	0.00	0.00	0.00	8.25	49.64	0.07	0.04	0.04	0.01	0.47				99.20
2523M_LK_2004-03_Pt-0137_Gr-02	till	OLI	olivine_forsterite	40.79	0.00	0.00	0.00	8.31	49.51	0.14	0.01	0.00	0.02	0.35				99.13
2523M_LK_2004-03_Pt-0138_Gr-03	till	OLI	olivine_forsterite	40.32	0.00	0.00	0.00	9.54	48.41	0.08	0.07	0.04	0.04	0.53				99.02
2523M_LK_2004-03_Pt-0139_Gr-04	till	OLI	olivine_forsterite	40.80	0.00	0.00	0.00	7.43	50.49	0.08	0.01	0.00	0.01	0.55				99.38
2523M_LK_2004-03_Pt-0218_Gr-01	till	CHR	spinel_chromite	0.00	0.13	18.00	47.43	24.03	10.93	0.29	0.00	0.00	0.01	0.14				100.96
2524M_LK_2004-03_Pt-0140_Gr-01	till	OLI	olivine_forsterite	40.31	0.00	0.00	0.00	9.54	48.71	0.02	0.00	0.00	0.00	0.45				99.04
2524M_LK_2004-03_Pt-0142_Gr-01	till	OLI	olivine_forsterite	40.51	0.00	0.00	0.00	8.68	49.37	0.08	0.02	0.01	0.04	0.42				99.11
2524M_LK_2004-03_Pt-0143_Gr-02	till	OLI	olivine_forsterite	40.42	0.00	0.00	0.00	9.59	48.34	0.11	0.09	0.08	0.01	0.38				99.02
2524M_LK_2004-03_Pt-0144_Gr-03	till	OLI	olivine_forsterite	40.38	0.00	0.00	0.00	9.00	49.43	0.07	0.00	0.00	0.00	0.39				99.27
2524M_LK_2004-03_Pt-0145_Gr-01	till	OLI	olivine_forsterite	40.61	0.00	0.00	0.00	8.58	49.24	0.12	0.07	0.04	0.00	0.42				99.08
2525M_LK_2004-03_Pt-0065_Gr-01	till	CPX	clinopyroxene_chromian diopside	53.11	0.08	1.43	0.80	2.27	16.77	0.05	24.39	0.33	0.01	0.06				99.29
2525M_LK_2004-03_Pt-0066_Gr-02	till	CPX	clinopyroxene_diopside/aegirine-augite	53.59	0.00	1.89	0.32	6.63	13.54	0.14	20.19	3.16	0.00	0.00				99.46
2525M_LK_2004-03_Pt-0146_Gr-01	till	OLI	olivine_forsterite	40.54	0.00	0.00	0.00	8.74	49.21	0.08	0.02	0.03	0.01	0.42				99.05
2525M_LK_2004-03_Pt-0147_Gr-01	till	OLI	olivine_forsterite	39.97	0.00	0.00	0.00	10.88	47.68	0.03	0.05	0.03	0.05	0.36				99.05
2525M_LK_2004-03_Pt-0148_Gr-01	till	OLI	olivine_forsterite	40.79	0.00	0.00	0.00	7.53	50.32	0.06	0.00	0.00	0.00	0.50				99.20
2525M_LK_2004-03_Pt-0219_Gr-01	till	CHR	spinel_magnesiochromite	0.00	1.21	15.05	47.93	22.19	13.25	0.24	0.00	0.00	0.00	0.29				100.16
2526M_LK_2003-02_Pt-0103_Gr-01	till	PYR-DEF	garnet_pyrope_G9	41.04	0.13	17.89	6.47	7.73	19.03	0.45	6.17	0.00	0.01	0.01	0.03			98.96
2526M_LK_2003-02_Pt-0104_Gr-02	till	PYR-DEF	garnet_pyrope_G9	40.96	0.06	17.39	7.04	8.25	18.04	0.44	6.79	0.00	0.00	0.00	0.00			98.97
2526M_LK_2003-02_Pt-0150_Gr-01	till	CPX-DEF	clinopyroxene_chromian diopside	55.20	0.05	0.47	0.72	2.13	17.10	0.07	23.59	0.54	0.00	0.03	0.00			99.91
2526M_LK_2003-02_Pt-1046_Gr-01	till	CHR	spinel_chromite	0.01	0.26	8.29	56.53	22.17	10.56	0.32	0.00	0.00	0.00	0.09	0.06	0.17	0.23	98.45
2526M_LK_2004-03_Pt-0044_Gr-01	till	ECL	garnet_almandine_G3	38.57	0.02	22.82	0.00	20.56	8.99	0.36	8.31	0.06	0.00	0.05				99.73
2527M_LK_2004-03_Pt-0067_Gr-01	till	CPX	clinopyroxene_chromian diopside	51.22	0.19	6.83	0.66	2.89	14.96	0.09	20.80	2.05	0.00	0.03				99.72
2528M_LK_2004-03_Pt-0045_Gr-01	till	ECL	garnet_almandine_G3	37.77	0.00	22.25	0.00	23.52	7.67	0.32	8.06	0.00	0.01	0.00				99.60
2528M_LK_2004-03_Pt-0068_Gr-01	till	CPX	clinopyroxene_chromian diopside	53.92	0.00	1.76	0.81	2.45	15.94	0.05	23.82	0.77	0.00	0.03				99.55
2528M_LK_2004-03_Pt-0069_Gr-02	till	CPX	clinopyroxene_diopside	53.75	0.00	0.61	0.03	5.24	15.06	0.24	23.94	0.63	0.02	0.00				99.52
2528M_LK_2004-03_Pt-0070_Gr-03	till	CPX	clinopyroxene_diopside	54.09	0.00	0.39	0.00	4.64	15.08	0.13	24.27	0.71	0.00	0.04				99.36
2529M_LK_2003-02_Pt-0105_Gr-01	till	PYR-POS	garnet_pyrope_G9	41.31	0.01	20.14	3.66	8.60	19.12	0.50	5.61	0.01	0.00	0.00	0.03			99.00
2529M_LK_2003-02_Pt-0106_Gr-02	till	PYR-POS	garnet_pyrope_G9	41.21	0.01	19.54	4.63	7.67	19.69	0.49	5.78	0.02	0.02	0.00	0.02			99.08
2529M_LK_2003-02_Pt-0107_Gr-03	till	PYR-POS	garnet_pyrope_G9	41.61	0.00	20.31	3.36	8.71	19.29	0.53	5.52	0.00	0.00	0.00	0.00			99.33
2529M_LK_2003-02_Pt-0108_Gr-04	till	PYR-POS	garnet_pyrope_G9	41.10	0.17	16.72	7.94	7.53	18.47	0.40	6.97	0.03	0.08	0.00	0.03			99.44

Grain_ID	Grain Source	Picked As	Mineral (Post-Probe)	SiO2	TiO2	Al2O3	Cr2O3	FeO	MgO	MnO	CaO	Na2O	K2O	NiO	ZnO	Nb2O5	V2O5	Total
2529M_LK_2003-02_Pt-0109_Gr-05	till	PYR-POS	garnet_pyrope_G9	41.70	0.04	20.67	2.99	9.12	19.18	0.56	5.20	0.00	0.05	0.00	0.00			99.50
2529M_LK_2003-02_Pt-0110_Gr-06	till	PYR-POS	garnet_pyrope_G9	41.66	0.03	19.10	4.86	8.32	19.05	0.50	5.92	0.02	0.00	0.00	0.01			99.47
2529M_LK_2003-02_Pt-0111_Gr-07	till	PYR-POS	garnet_pyrope_G9	41.47	0.00	18.83	5.64	8.33	18.72	0.50	6.40	0.00	0.01	0.02	0.00			99.92
2529M_LK_2003-02_Pt-0112_Gr-08	till	PYR-POS	garnet_pyrope_G12	40.99	0.00	17.84	6.81	8.14	17.52	0.52	7.46	0.00	0.01	0.02	0.00			99.31
2529M_LK_2003-02_Pt-0113_Gr-09	till	PYR-POS	garnet_pyrope_G12	40.86	0.01	17.70	6.76	8.09	17.79	0.54	7.32	0.00	0.01	0.02	0.00			99.09
2529M_LK_2003-02_Pt-0114_Gr-10	till	PYR-POS	garnet_pyrope_G9	40.92	0.06	17.66	6.76	8.03	18.63	0.47	6.36	0.00	0.01	0.00	0.00			98.90
2529M_LK_2003-02_Pt-0115_Gr-01	till	PYR-DEF	garnet_pyrope_G9	40.80	0.10	16.95	7.69	7.80	18.07	0.50	6.91	0.02	0.02	0.01	0.00			98.87
2529M_LK_2003-02_Pt-0116_Gr-02	till	PYR-DEF	garnet_pyrope_G9	41.05	0.37	16.76	7.62	8.01	18.67	0.53	6.01	0.08	0.00	0.00	0.00			99.11
2529M_LK_2003-02_Pt-0117_Gr-03	till	PYR-DEF	garnet_pyrope_G9	41.64	0.00	19.05	5.27	7.48	19.55	0.48	6.01	0.01	0.04	0.01	0.02			99.57
2529M_LK_2003-02_Pt-0118_Gr-04	till	PYR-DEF	garnet_pyrope_G9	41.56	0.04	19.15	5.41	7.84	19.57	0.55	5.80	0.03	0.00	0.00	0.03			99.97
2529M_LK_2003-02_Pt-0119_Gr-05	till	PYR-DEF	garnet_pyrope_G9	41.22	0.08	17.69	7.04	7.60	18.94	0.43	6.25	0.03	0.06	0.00	0.00			99.33
2529M_LK_2003-02_Pt-0120_Gr-06	till	PYR-DEF	garnet_pyrope_G9	41.34	0.03	19.67	4.43	9.24	18.28	0.50	6.02	0.02	0.02	0.02	0.02			99.59
2529M_LK_2003-02_Pt-0121_Gr-07	till	PYR-DEF	garnet_pyrope_G9	41.52	0.05	17.82	6.99	8.02	18.26	0.53	6.44	0.02	0.00	0.00	0.00			99.65
2529M_LK_2003-02_Pt-0122_Gr-08	till	PYR-DEF	garnet_pyrope_G9	40.97	0.24	16.76	7.79	8.38	18.14	0.51	6.73	0.03	0.00	0.00	0.00			99.55
2529M_LK_2003-02_Pt-0123_Gr-09	till	PYR-DEF	garnet_pyrope_G9	41.19	0.01	18.00	6.64	7.87	18.83	0.46	6.49	0.02	0.00	0.00	0.00			99.51
2529M_LK_2003-02_Pt-0124_Gr-10	till	PYR-DEF	garnet_pyrope_G9	41.48	0.03	18.56	5.70	8.50	18.61	0.59	6.09	0.01	0.05	0.00	0.00			99.62
2529M_LK_2003-02_Pt-0125_Gr-11	till	PYR-DEF	garnet_pyrope_G9	41.94	0.03	20.58	3.50	7.67	20.43	0.52	5.23	0.01	0.02	0.00	0.00			99.93
2529M_LK_2003-02_Pt-0126_Gr-12	till	PYR-DEF	garnet_pyrope_G9	41.09	0.19	17.23	7.16	8.40	18.48	0.57	6.33	0.04	0.03	0.02	0.01			99.55
2529M_LK_2003-02_Pt-0127_Gr-13	till	PYR-DEF	garnet_pyrope_G9	41.19	0.03	18.45	6.15	7.81	18.92	0.48	6.31	0.02	0.00	0.00	0.00			99.36
2529M_LK_2003-02_Pt-0128_Gr-14	till	PYR-DEF	garnet_pyrope_G9	41.67	0.32	19.90	3.72	8.59	19.81	0.44	5.28	0.04	0.00	0.01	0.00			99.79
2529M_LK_2003-02_Pt-0129_Gr-15	till	PYR-DEF	garnet_pyrope_G9	41.64	0.02	19.23	4.99	7.82	19.35	0.54	6.02	0.01	0.00	0.00	0.00			99.62
2529M_LK_2003-02_Pt-0130_Gr-16	till	PYR-DEF	garnet_pyrope_G11	41.48	0.46	19.06	4.47	8.04	20.04	0.37	5.28	0.07	0.01	0.00	0.01			99.29
2529M_LK_2003-02_Pt-0151_Gr-01	till	CPX-POS	amphibole_edenite	48.34	0.03	9.11	1.95	2.69	20.31	0.05	10.36	3.18	1.33	0.12	0.00			97.48
2529M_LK_2004-03_Pt-0071_Gr-01	till	CPX	clinopyroxene_chromian diopside	51.63	0.08	5.77	0.52	2.66	15.08	0.04	21.76	1.47	0.00	0.04				99.04
2530M_LK_2003-02_Pt-0131_Gr-01	till	PYR	garnet_pyrope_G9	41.24	0.03	16.91	7.93	7.51	18.34	0.45	6.65	0.02	0.00	0.03	0.01			99.12
2530M_LK_2003-02_Pt-0132_Gr-02	till	PYR	garnet_pyrope_G9	41.22	0.00	18.35	5.85	8.28	17.95	0.59	6.70	0.03	0.00	0.03	0.04			99.03
2530M_LK_2003-02_Pt-0133_Gr-03	till	PYR	garnet_pyrope_G9	41.10	0.06	16.98	7.44	8.11	18.00	0.48	6.86	0.00	0.03	0.00	0.00			99.06
2530M_LK_2003-02_Pt-0134_Gr-04	till	PYR	garnet_pyrope_G9	41.40	0.01	19.09	5.10	8.18	19.01	0.48	5.94	0.01	0.00	0.00	0.00			99.22
2530M_LK_2003-02_Pt-0135_Gr-05	till	PYR	garnet_pyrope_G9	41.53	0.02	18.78	5.39	7.75	19.83	0.37	5.73	0.03	0.04	0.01	0.00			99.48
2530M_LK_2003-02_Pt-0136_Gr-06	till	PYR	garnet_pyrope_G9	41.10	0.00	18.66	5.61	8.58	18.05	0.56	6.57	0.01	0.03	0.01	0.01			99.19
2530M_LK_2003-02_Pt-0137_Gr-07	till	PYR	garnet_pyrope_G9	41.42	0.00	19.43	4.82	8.03	19.11	0.55	5.93	0.02	0.00	0.00	0.00			99.31
2530M_LK_2003-02_Pt-0138_Gr-01	till	PYR	garnet_pyrope_G9	41.34	0.07	20.97	2.08	10.25	18.47	0.63	5.10	0.04	0.00	0.00	0.00			98.95
2530M_LK_2003-02_Pt-0139_Gr-02	till	PYR	garnet_pyrope_G9	41.69	0.28	19.61	3.96	8.11	19.78	0.46	5.03	0.03	0.00	0.00	0.06			99.00
2530M_LK_2003-02_Pt-0140_Gr-03	till	PYR	garnet_pyrope_G9	41.63	0.30	19.98	3.48	8.82	19.84	0.44	4.82	0.04	0.00	0.00	0.00			99.35
2530M_LK_2003-02_Pt-0152_Gr-01	till	CPX-POS	clinopyroxene_chromian diopside	55.48	0.04	2.06	1.71	1.50	16.45	0.08	21.18	1.41	0.02	0.05	0.04			100.02
2530M_LK_2003-02_Pt-1004_Gr-01	till	ILM	spinel_chromite	0.04	3.13	2.95	40.20	43.19	6.45	0.38	0.00	0.00	0.01	0.29	0.11	0.23	0.38	96.98
2530M_LK_2003-02_Pt-1047_Gr-01	till	CHR	spinel_chromite	0.05	2.25	5.94	49.89	30.54	8.55	0.43	0.00	0.00	0.00	0.17	0.14	0.16	0.36	98.13
2530M_LK_2003-02_Pt-1048_Gr-02	till	CHR	spinel_chromite	0.01	0.39	8.72	50.02	30.21	8.09	0.52	0.00	0.00	0.00	0.12	0.17	0.22	0.07	98.48

Grain_ID	Grain Source	Picked As	Mineral (Post-Probe)	SiO2	TiO2	Al2O3	Cr2O3	FeO	MgO	MnO	CaO	Na2O	K2O	NiO	ZnO	Nb2O5	V2O5	Total
2530M_LK_2003-02_Pt-1049_Gr-03	till	CHR	spinel_chromite	0.01	0.04	11.63	54.48	21.07	11.40	0.38	0.00	0.01	0.00	0.08	0.14	0.16	0.21	99.41
2530M_LK_2003-02_Pt-1050_Gr-04	till	CHR	spinel_chromite	0.00	2.40	2.68	40.51	44.68	6.01	0.45	0.00	0.00	0.01	0.26	0.17	0.23	0.34	97.41
2530M_LK_2003-04_Pt-0034_Gr-01	till	CPX	amphibole_pargasite	44.61	0.11	12.59	1.47	2.27	19.04	0.03	12.45	2.27	0.91					95.75
2530M_LK_2003-04_Pt-0035_Gr-02	till	CPX	amphibole_edenite	48.48	0.06	7.92	2.10	2.47	20.10	0.06	9.28	3.91	0.73					95.11
2530M_LK_2003-04_Pt-0036_Gr-03	till	CPX	amphibole_pargasite	44.60	0.07	11.77	1.95	2.36	19.10	0.05	11.62	2.52	1.26					95.28
2530M_LK_2003-04_Pt-0037_Gr-04	till	CPX	clinopyroxene_chromian diopside	53.42	0.13	1.86	0.63	4.09	15.44	0.12	22.00	0.85	0.01					98.55
2530M_LK_2003-04_Pt-0038_Gr-05	till	CPX	amphibole_edenite	46.50	0.07	10.48	2.09	2.42	19.46	0.05	10.88	2.97	0.92					95.86
2530M_LK_2003-04_Pt-0039_Gr-06	till	CPX	clinopyroxene_chromian diopside	54.42	0.09	0.10	1.38	2.88	16.04	0.08	22.35	1.12	0.01					98.46
2530M_LK_2003-04_Pt-0040_Gr-07	till	CPX	unknown_mica?	59.07	0.01	14.46	0.00	6.44	6.80	0.00	0.15	0.00	6.61					93.54
2530M_LK_2003-04_Pt-0041_Gr-08	till	CPX	amphibole_edenite	45.20	0.05	11.09	2.17	2.12	19.47	0.03	11.22	2.66	1.08					95.09
2530M_LK_2003-04_Pt-0042_Gr-09	till	CPX	amphibole_edenite	47.69	0.14	9.15	2.12	3.05	19.71	0.07	8.66	4.44	0.49					95.52
2530M_LK_2003-04_Pt-0043_Gr-10	till	CPX	amphibole_edenite	45.51	0.06	10.98	1.60	3.34	19.08	0.05	11.86	2.71	0.85					96.05
2530M_LK_2003-04_Pt-0044_Gr-11	till	CPX	amphibole_edenite	45.37	0.04	10.78	2.17	2.16	19.53	0.06	11.20	2.77	1.07					95.14
2530M_LK_2003-04_Pt-0045_Gr-12	till	CPX	amphibole_edenite	45.29	0.03	10.74	2.13	2.18	19.46	0.05	11.37	2.85	1.10					95.20
2530M_LK_2003-04_Pt-0046_Gr-13	till	CPX	amphibole_edenite	48.10	0.08	7.94	1.91	2.48	20.38	0.05	10.31	3.38	0.90					95.52
2530M_LK_2004-03_Pt-0001_Gr-01	till	PYR	garnet_pyrope_G9	40.04	0.08	19.42	5.75	8.77	18.02	0.58	6.54	0.04	0.02	0.00				99.26
2530M_LK_2004-03_Pt-0002_Gr-02	till	PYR	garnet_pyrope_G9	40.38	0.00	22.19	2.79	9.02	19.24	0.41	5.06	0.04	0.00	0.06				99.19
2530M_LK_2004-03_Pt-0003_Gr-03	till	PYR	garnet_pyrope_G9	40.20	0.00	19.56	5.76	8.67	18.27	0.52	6.35	0.05	0.02	0.05				99.45
2530M_LK_2004-03_Pt-0004_Gr-04	till	PYR	garnet_pyrope_G9	40.51	0.00	21.15	4.14	8.47	19.10	0.53	5.90	0.07	0.00	0.06				99.93
2530M_LK_2004-03_Pt-0005_Gr-05	till	PYR	garnet_pyrope_G9	40.43	0.00	20.28	4.77	8.46	18.53	0.50	6.14	0.01	0.00	0.00				99.12
2530M_LK_2004-03_Pt-0006_Gr-06	till	PYR	garnet_pyrope_G9	39.45	0.05	16.86	9.08	8.75	17.43	0.53	7.29	0.08	0.00	0.00				99.52
2530M_LK_2004-03_Pt-0007_Gr-07	till	PYR	garnet_pyrope_G9	41.00	0.00	20.62	4.85	8.47	18.75	0.47	5.89	0.03	0.02	0.05				100.15
2530M_LK_2004-03_Pt-0008_Gr-08	till	PYR	garnet_pyrope_G9	40.15	0.00	20.34	5.27	8.64	18.16	0.49	6.00	0.02	0.02	0.10				99.20
2530M_LK_2004-03_Pt-0009_Gr-09	till	PYR	garnet_pyrope_G9	40.86	0.00	21.41	3.40	8.77	19.40	0.41	4.85	0.03	0.00	0.00				99.13
2530M_LK_2004-03_Pt-0010_Gr-10	till	PYR	garnet_pyrope_G9	40.80	0.00	21.36	3.48	7.96	19.16	0.50	5.72	0.06	0.00	0.02				99.06
2530M_LK_2004-03_Pt-0011_Gr-11	till	PYR	garnet_pyrope_G9	40.39	0.00	20.30	4.95	8.61	18.61	0.54	6.12	0.04	0.00	0.01				99.57
2530M_LK_2004-03_Pt-0013_Gr-01	till	PYR	garnet_almandine_G0	36.88	0.00	22.38	0.00	32.89	6.24	0.48	1.01	0.00	0.00	0.00				99.88
2530M_LK_2004-03_Pt-0014_Gr-02	till	PYR	garnet_pyrope_G9	40.44	0.00	20.50	4.91	8.53	18.25	0.46	6.26	0.00	0.02	0.00				99.37
2530M_LK_2004-03_Pt-0015_Gr-03	till	PYR	garnet_pyrope_G9	40.92	0.03	21.51	3.06	8.78	19.37	0.36	5.13	0.04	0.01	0.05				99.26
2530M_LK_2004-03_Pt-0046_Gr-01	till	ECL	garnet_pyrope_G3	40.08	0.33	22.61	0.43	11.66	16.91	0.47	6.54	0.07	0.00	0.03				99.13
2530M_LK_2004-03_Pt-0149_Gr-01	till	OLI	clinopyroxene_diopside	53.78	0.00	0.61	0.00	3.72	15.91	0.12	24.98	0.11	0.00	0.00				99.23
2530M_LK_2004-03_Pt-0150_Gr-02	till	OLI	clinopyroxene_diopside	54.74	0.00	0.12	0.00	3.18	16.19	0.14	25.55	0.09	0.00	0.00				100.02
2530M_LK_2004-03_Pt-0151_Gr-03	till	OLI	olivine_forsterite	40.38	0.00	0.00	0.00	8.68	49.59	0.05	0.00	0.00	0.00	0.39				99.10
2530M_LK_2004-03_Pt-0152_Gr-04	till	OLI	olivine_forsterite	40.75	0.00	0.00	0.00	7.50	50.38	0.11	0.02	0.00	0.01	0.39				99.16
2530M_LK_2004-03_Pt-0153_Gr-05	till	OLI	clinopyroxene_diopside	53.87	0.02	0.93	0.00	3.58	16.00	0.19	24.74	0.17	0.00	0.00				99.50
2530M_LK_2004-03_Pt-0154_Gr-06	till	OLI	clinopyroxene_diopside	53.89	0.00	0.58	0.00	3.61	15.97	0.20	24.96	0.15	0.01	0.00				99.37
2530M_LK_2004-03_Pt-0155_Gr-01	till	OLI	olivine_forsterite	40.30	0.00	0.00	0.00	9.40	48.74	0.11	0.01	0.07	0.00	0.48				99.11
2530M_LK_2004-03_Pt-0156_Gr-02	till	OLI	olivine_forsterite	40.70	0.00	0.00	0.00	7.74	50.56	0.03	0.00	0.00	0.00	0.49				99.52

Grain_ID	Grain Source	Picked As	Mineral (Post-Probe)	SiO2	TiO2	Al2O3	Cr2O3	FeO	MgO	MnO	CaO	Na2O	K2O	NiO	ZnO	Nb2O5	V2O5	Total
2530M_LK_2004-03_Pt-0157_Gr-03	till	OLI	olivine_forsterite	40.52	0.00	0.00	0.00	9.21	48.81	0.08	0.00	0.05	0.00	0.37				99.04
2530M_LK_2004-03_Pt-0158_Gr-04	till	OLI	olivine_forsterite	40.26	0.00	0.00	0.00	9.49	48.69	0.08	0.02	0.01	0.00	0.44				99.00
2530M_LK_2004-03_Pt-0159_Gr-05	till	OLI	olivine_forsterite	40.22	0.00	0.00	0.00	9.77	48.87	0.13	0.00	0.00	0.00	0.40				99.39
2530M_LK_2004-03_Pt-0220_Gr-01	till	CHR	spinel_chromite	0.00	0.35	6.64	56.59	27.27	8.97	0.42	0.00	0.00	0.00	0.09				100.33
2530M_LK_2004-03_Pt-0221_Gr-02	till	CHR	spinel_chromite	0.00	0.35	6.78	56.75	26.32	8.75	0.42	0.00	0.01	0.00	0.21				99.58
2530M_LK_2004-03_Pt-0222_Gr-03	till	CHR	spinel_chromite	0.00	0.39	12.49	55.10	20.65	10.91	0.38	0.00	0.00	0.02	0.18				100.12
2530M_LK_2004-03_Pt-0223_Gr-04	till	CHR	spinel_chromite	0.00	0.00	10.47	57.03	21.46	10.26	0.38	0.00	0.01	0.01	0.10				99.73
2530M_LK_2004-03_Pt-0224_Gr-05	till	CHR	spinel_magnesiochromite	0.00	0.01	14.91	54.98	18.05	11.22	0.41	0.00	0.00	0.00	0.07				99.64
2530M_LK_2004-03_Pt-0225_Gr-06	till	CHR	spinel_chromite	0.00	0.17	16.10	52.63	19.62	10.77	0.37	0.00	0.03	0.00	0.14				99.83
2530M_LK_2004-03_Pt-0226_Gr-07	till	CHR	spinel_chromite	0.00	0.21	10.68	55.09	23.69	10.30	0.42	0.00	0.03	0.00	0.11				100.53
2530M_LK_2004-03_Pt-0227_Gr-08	till	CHR	spinel_magnesiochromite	0.00	0.05	12.56	58.73	17.01	11.55	0.26	0.00	0.00	0.00	0.02				100.19
2530M_LK_2004-03_Pt-0228_Gr-09	till	CHR	spinel_chromite	0.00	0.99	0.98	60.51	27.58	8.75	0.44	0.00	0.00	0.04	0.06				99.35
2530M_LK_2004-03_Pt-0229_Gr-10	till	CHR	spinel_chromite	0.00	0.61	6.59	55.62	27.62	8.88	0.50	0.00	0.02	0.02	0.16				100.01
2530M_LK_2004-03_Pt-0230_Gr-11	till	CHR	spinel_magnesiochromite	0.00	0.11	12.43	56.30	18.97	10.99	0.41	0.00	0.03	0.00	0.07				99.32
2530M_LK_2004-03_Pt-0231_Gr-12	till	CHR	spinel_chromite	0.00	1.06	6.27	60.64	21.98	9.86	0.44	0.00	0.01	0.00	0.08				100.35
2530M_LK_2004-03_Pt-0232_Gr-13	till	CHR	spinel_chromite	0.00	0.82	1.61	60.38	28.69	7.55	0.51	0.00	0.00	0.00	0.11				99.67
2530M_LK_2004-03_Pt-0233_Gr-14	till	CHR	spinel_chromite	0.00	0.28	10.20	54.66	23.95	10.38	0.37	0.00	0.00	0.01	0.13				99.97
2530M_LK_2004-03_Pt-0234_Gr-15	till	CHR	spinel_chromite	0.00	0.07	9.06	57.29	22.76	9.69	0.43	0.00	0.00	0.01	0.03				99.33
2530M_LK_2004-03_Pt-0235_Gr-16	till	CHR	spinel_chromite	0.00	0.11	11.82	54.71	22.18	10.48	0.51	0.00	0.03	0.06	0.05				99.95
2530M_LK_2004-03_Pt-0236_Gr-17	till	CHR	spinel_magnesiochromite	0.00	0.03	16.66	53.45	17.88	11.85	0.35	0.00	0.00	0.00	0.11				100.33
2530M_LK_2004-03_Pt-0237_Gr-18	till	CHR	spinel_chromite	0.00	1.06	10.41	54.04	23.16	10.21	0.36	0.00	0.00	0.00	0.18				99.42
2531M_LK_2004-03_Pt-0072_Gr-01	till	CPX	clinopyroxene_chromian diopside	53.57	0.00	1.23	0.73	3.62	16.03	0.06	23.45	1.01	0.00	0.13				99.83
2531M_LK_2004-03_Pt-0160_Gr-01	till	OLI	olivine_forsterite	39.76	0.00	0.00	0.00	9.74	48.99	0.04	0.00	0.04	0.00	0.47				99.04
2531M_LK_2004-03_Pt-0162_Gr-01	till	OLI	olivine_forsterite	38.79	0.00	0.00	0.00	18.17	42.08	0.16	0.00	0.01	0.01	0.37				99.59
2531M_LK_2004-03_Pt-0163_Gr-02	till	OLI	olivine_forsterite	39.93	0.00	0.00	0.00	10.01	48.74	0.04	0.00	0.07	0.00	0.41				99.20
2533M_LK_2004-03_Pt-0073_Gr-01	till; field duplicate of 2504M	CPX	clinopyroxene_chromian diopside	52.89	0.00	1.53	0.51	5.23	15.26	0.12	22.51	0.91	0.00	0.09				99.05
2559M_LK_2003-02_Pt-0153_Gr-01	kimberlite K6; mantle xenolith	CPX	clinopyroxene_chromian diopside	54.69	0.11	3.17	1.15	1.75	16.46	0.09	22.48	0.81	0.05	0.03	0.00			100.77
2559M_LK_2003-02_Pt-0154_Gr-02	kimberlite K6; mantle xenolith	CPX	clinopyroxene_chromian augite	53.04	0.06	3.15	1.27	2.23	19.03	0.09	19.75	0.56	0.00	0.04	0.01			99.23
2559M_LK_2003-02_Pt-0155_Gr-03	kimberlite K6; mantle xenolith	CPX	clinopyroxene_chromian diopside	54.39	0.09	2.86	1.01	1.66	16.44	0.10	22.78	0.78	0.06	0.01	0.00			100.18
2559M_LK_2003-02_Pt-0156_Gr-04	kimberlite K6; mantle xenolith	CPX	clinopyroxene_chromian diopside	54.25	0.10	3.00	1.10	1.65	16.28	0.12	23.25	0.82	0.01	0.05	0.01			100.63
2559M_LK_2003-02_Pt-0157_Gr-05	kimberlite K6; mantle xenolith	CPX	clinopyroxene_chromian diopside	54.13	0.12	2.77	1.00	1.73	16.69	0.07	22.51	0.75	0.06	0.01	0.01			99.84
2559M_LK_2003-02_Pt-0158_Gr-06	kimberlite K6; mantle xenolith	CPX	clinopyroxene_chromian diopside	53.57	0.10	3.38	1.17	1.75	16.11	0.08	22.89	0.85	0.08	0.01	0.01			100.00
2559M_LK_2003-02_Pt-0159_Gr-07	kimberlite K6; mantle xenolith	CPX	clinopyroxene_chromian diopside	54.54	0.09	2.83	1.06	1.59	16.57	0.05	22.92	0.72	0.00	0.04	0.00			100.40
2559M_LK_2003-02_Pt-0160_Gr-08	kimberlite K6; mantle xenolith	CPX	clinopyroxene_chromian diopside	54.79	0.06	2.90	1.04	1.70	16.79	0.06	22.62	0.78	0.00	0.00	0.00			100.74
2559M_LK_2003-02_Pt-0161_Gr-09	kimberlite K6; mantle xenolith	CPX	clinopyroxene_chromian diopside	54.94	0.07	2.76	1.00	1.84	16.65	0.08	22.37	0.76	0.03	0.02	0.00			100.52
2559M_LK_2003-02_Pt-0162_Gr-10	kimberlite K6; mantle xenolith	CPX	clinopyroxene_chromian diopside	54.58	0.09	3.24	1.13	1.67	16.48	0.08	22.70	0.80	0.02	0.04	0.00			100.83
2559M_LK_2003-02_Pt-0163_Gr-01	kimberlite K6; mantle xenolith	OLV-POS	olivine_forsterite	40.80	0.00	0.01	0.00	8.75	50.30	0.12	0.00	0.01	0.00	0.31	0.01			100.30
2559M_LK_2003-02_Pt-0164_Gr-02	kimberlite K6; mantle xenolith	OLV-POS	olivine_forsterite	39.91	0.00	0.00	0.00	8.89	50.11	0.11	0.01	0.01	0.00	0.30	0.00			99.35

Grain_ID	Grain Source	Picked As	Mineral (Post-Probe)	SiO2	TiO2	Al2O3	Cr2O3	FeO	MgO	MnO	CaO	Na2O	K2O	NiO	ZnO	Nb2O5	V2O5	Total
2559M_LK_2003-02_Pt-0165_Gr-03	kimberlite K6; mantle xenolith	OLV-POS	olivine_forsterite	40.00	0.00	0.00	0.01	8.70	50.17	0.11	0.00	0.00	0.00	0.37	0.02			99.39
2559M_LK_2003-02_Pt-0166_Gr-04	kimberlite K6; mantle xenolith	OLV-POS	olivine_forsterite	39.99	0.00	0.00	0.00	8.95	50.18	0.12	0.02	0.00	0.00	0.33	0.00			99.59
2559M_LK_2003-02_Pt-0167_Gr-05	kimberlite K6; mantle xenolith	OLV-POS	olivine_forsterite	39.87	0.00	0.00	0.00	8.75	50.03	0.10	0.00	0.00	0.00	0.35	0.00			99.10
2559M_LK_2003-02_Pt-0168_Gr-06	kimberlite K6; mantle xenolith	OLV-POS	olivine_forsterite	41.05	0.00	0.02	0.00	8.89	50.35	0.14	0.00	0.00	0.01	0.35	0.00			100.81
2559M_LK_2003-02_Pt-0169_Gr-07	kimberlite K6; mantle xenolith	OLV-POS	olivine_forsterite	41.00	0.01	0.01	0.01	8.81	50.39	0.09	0.00	0.00	0.00	0.33	0.06			100.72
2559M_LK_2003-02_Pt-0170_Gr-08	kimberlite K6; mantle xenolith	OLV-POS	olivine_forsterite	40.87	0.00	0.01	0.00	8.85	50.33	0.13	0.00	0.02	0.04	0.38	0.00			100.64
2559M_LK_2003-02_Pt-0171_Gr-09	kimberlite K6; mantle xenolith	OLV-POS	olivine_forsterite	40.11	0.01	0.04	0.00	8.77	49.93	0.10	0.00	0.00	0.04	0.34	0.03			99.37
2559M_LK_2003-02_Pt-0172_Gr-10	kimberlite K6; mantle xenolith	OLV-POS	olivine_forsterite	40.59	0.03	0.00	0.01	8.87	49.86	0.11	0.01	0.02	0.00	0.34	0.00			99.84
2739M_LK_2003-06_Pt-2014_Gr-OLV01	till; core BHH02-8; 25-33 m	OLV	olivine_forsterite	40.79	0.05	0.02	0.04	9.66	48.58	0.15	0.06	0.01	0.00	0.33	0.00	0.11		99.77
2739M_LK_2003-06_Pt-2015_Gr-OLV02	till; core BHH02-8; 25-33 m	OLV	olivine_forsterite	40.93	0.03	0.03	0.04	9.49	48.78	0.12	0.06	0.01	0.00	0.45	0.00	0.01		99.95
2739M_LK_2003-06_Pt-2016_Gr-OLV03	till; core BHH02-8; 25-33 m	OLV	olivine_forsterite	41.22	0.03	0.01	0.04	7.82	49.94	0.09	0.04	0.00	0.01	0.45	0.00	0.06		99.69
2739M_LK_2003-06_Pt-2017_Gr-OLV04	till; core BHH02-8; 25-33 m	OLV	olivine_forsterite	41.05	0.00	0.01	0.10	7.81	50.09	0.07	0.06	0.00	0.00	0.35	0.08	0.09		99.68
2739M_LK_2003-06_Pt-2018_Gr-OLV05	till; core BHH02-8; 25-33 m	OLV	olivine_forsterite	40.89	0.01	0.01	0.01	9.72	49.11	0.07	0.06	0.03	0.02	0.38	0.00	0.13		100.40
2739M_LK_2003-06_Pt-2019_Gr-OLV06	till; core BHH02-8; 25-33 m	OLV	olivine_forsterite	41.46	0.00	0.00	0.00	8.19	49.78	0.11	0.01	0.02	0.00	0.41	0.06	0.11		100.12
2739M_LK_2003-06_Pt-2020_Gr-OLV07	till; core BHH02-8; 25-33 m	OLV	olivine_forsterite	40.93	0.00	0.05	0.05	9.30	49.18	0.09	0.05	0.00	0.01	0.43	0.06	0.00		100.15
2739M_LK_2003-06_Pt-2021_Gr-OLV08	till; core BHH02-8; 25-33 m	OLV	olivine_forsterite	41.27	0.02	0.00	0.00	8.12	49.79	0.13	0.02	0.01	0.00	0.41	0.00	0.04		99.80
2739M_LK_2003-06_Pt-2022_Gr-OLV09	till; core BHH02-8; 25-33 m	OLV	olivine_forsterite	40.78	0.04	0.00	0.05	9.21	48.87	0.06	0.05	0.03	0.01	0.36	0.00	0.06		99.50
2739M_LK_2003-06_Pt-2023_Gr-OLV10	till; core BHH02-8; 25-33 m	OLV	olivine_forsterite	41.00	0.02	0.00	0.05	9.05	49.11	0.10	0.03	0.00	0.00	0.36	0.00	0.07		99.77
Quality Control:																		
2005M_LK_2003-04_Pt-0005_Gr-04-2nd	till [2nd probe analysis of grain]	CPX	amphibole_edenite	45.73	0.09	11.22	1.77	3.37	19.03	0.09	9.60	3.85	0.53					95.28
2007M_LK_2003-04_Pt-0015_Gr-01_2nd	till [2nd probe analysis of grain]	CPX	clinopyroxene_chromian diopside	53.89	0.02	0.62	3.26	2.34	15.35	0.10	20.34	2.11	0.00					98.03
2007M_LK_2003-04_Pt-0015_Gr-01_3rd	till [3rd probe analysis of grain]	CPX	clinopyroxene_chromian diopside	54.54	0.02	0.61	3.26	2.34	15.33	0.10	19.93	2.11	0.00					98.25

Appendix 2 – Summary of Picked and Probed Grains

All samples collected in the Sawn Lake map area (NTS 84B/13)

Coordinate system is Universal Transverse Mercator, North American Datum 1983, Zone 11

Easting and Northing are in metres

Till sample descriptions are provided in Prior et al. (2005)

					Picked KIM Grains Normalized to 30 kg						Picked KIM Grains							Confirmed Grains (Mineralogy Based on Microprobe Data)																		
Sample	Sample Material	Easting	Northing	Original Sample Weight (kg)	Pyrope	Clinopyroxene (Cr-Diopside)	Eclogitic Garnet	Olivine	Ilmenite (Picroilmenite)	Chromite	Pyrope	Clinopyroxene (Cr-Diopside)	Eclogitic Garnet	Olivine	Ilmenite (Picroilmenite)	Chromite	Sum of Picked KIM Grains	Edenite/Pargasite	Magnesiohornblende	Cr-Diopside/Augite	Diopside	G0 Garnet	G1 Garnet	G3 Garnet	G4 Garnet	G9 Garnet	G11 Garnet	G12 Garnet	Grossular	Ilmenite	Ilmenite-Rutile	Forsterite	Chromite	Spinel	Tourmaline (picked as tourmaline)	Unknown	Sum of Microprobed Grains
2001M	till; near surface	568009	6311986	28.15	0	1	0	1	0	0	0	1	0	1	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2002M	till; near surface	564508	6313845	30.55	0	0	0	25	0	0	0	0	0	25	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003M	till; near surface	579834	6301421	13.45	4	0	0	187	0	0	2	0	0	84	0	0	86	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2004M	till; near surface	578296	6298995	18.05	7	0	2	35	0	3	4	0	1	21	0	2	28	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	2
2005M	till; near surface	578163	6301765	23.85	526	6	8	172	0	239	418	5	6	137	0	190	756	9	0	4	0	1	0	3	2	11	0	0	1	0	0	0	10	0	0	0	41
2006M	till; near surface	575921	6299720	29.80	220	2	3	6	6	192	219	2	3	6	6	191	427	0	0	2	0	0	0	1	2	8	0	3	0	0	0	0	14	1	0	0	31
2007M	till; near surface	574097	6300675	31.85	123	8	1	61	2	121	131	8	1	65	2	128	335	6	0	7	1	0	0	1	0	9	0	1	0	0	0	0	5	0	0	0	30
2021M	till; near surface	588382	6300329	30.30	0	0	1	0	0	1	0	0	1	0	0	1	2	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4	0	6
2023M	till; near surface	580195	6292009	26.70	1	1	0	80	0	3	1	1	0	71	0	3	76	0	0	0	0	0	0	0	0	0	0	0	1	0	0	10	0	0	0	0	11
2024M	till; near surface	577935	6291933	27.30	1	0	0	22	0	1	1	0	0	20	0	1	22	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	3
2104M	till; near surface	588144	6303996	30.55	0	0	0	3	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2105M	till; near surface	588330	6300369	31.35	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2106M	till; near surface	575995	6302043	25.50	74	1	1	15	0	9	63	1	1	13	0	8	86	0	0	2	0	0	1	0	1	9	0	0	0	0	0	0	3	0	0	0	16
2107M	till; near surface	571995	6302689	34.60	10	2	0	51	0	1	12	2	0	59	0	1	74	0	0	2	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	11
2108M	till; near surface	585214	6299571	35.95	0	0	0	2	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2109M	till; near surface	573540	6303026	35.45	8	1	0	14	0	3	9	1	0	16	0	3	29	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2110M	till; near surface	567868	6304968	33.55	0	0	0	2	0	1	0	0	0	2	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2111M	till; near surface	563741	6305523	37.50	0	0	0	2	0	1	0	0	0	3	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2151M	till; near surface	584089	6292167	32.15	1	1	0	6	0	1	1	1	0	6	0	1	9	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2152M	till; near surface	586237	6295339	29.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2153M	till; near surface	581921	6295246	32.25	0	0	0	6	0	1	0	0	0	6	0	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2154M	till; near surface	576075	6304059	37.70	1	1	0	3	0	0	1	1	0	4	0	0	6	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
2155M	till; near surface	575958	6303213	37.45	0	1	0	7	0	1	0	1	0	9	0	1	11	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2156M	till; near surface	563456	6310223	33.90	0	0	0	4	0	1	0	0	0	4	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2501M	till; near surface	564273	6300732	28.25	8	1	0	23	0	3	8	1	0	22	0	3	34	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2502M	till; near surface	572218	6299784	34.90	8	2	0	27	0	3	9	2	0	31	0	3	45	0	0	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	5
2503M	till; near surface	579821	6303852	27.60	0	1	1	23	0	2	0	1	1	21	0	2	25	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
2504M	till; near surface	579937	6303017	23.70	0	0	1	95	0	0	0	0	1	75	0	0	76	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4	0	0	0	0	5
2505M	till; near surface	577938	6303014	25.55	0	32	0	1	1	4	0	27	0	1	1	3	32	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	8

					Picked KIM Grains Normalized to 30 kg						Picked KIM Grains							Confirmed Grains (Mineralogy Based on Microprobe Data)																				
Sample	Sample Material	Easting	Northing	Original Sample Weight (kg)	Pyrope	Clinopyroxene (Cr-Diopside)	Eclogitic Garnet	Olivine	Ilmenite (Picroilmenite)	Chromite	Pyrope	Clinopyroxene (Cr-Diopside)	Eclogitic Garnet	Olivine	Ilmenite (Picroilmenite)	Chromite	Sum of Picked KIM Grains	Edenite/Pargasite	Magnesiohornblende	Cr-Diopside/Augite	Diopside	G0 Garnet	G1 Garnet	G3 Garnet	G4 Garnet	G9 Garnet	G11 Garnet	G12 Garnet	Grossular	Ilmenite	Ilmenite-Rutile	Forsterite	Chromite	Spinel	Tourmaline (picked as tourmaline)	Unknown	Sum of Microprobed Grains
2506M	till; near surface	574968	6315342	26.80	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2507M	till; near surface	574856	6311448	27.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2508M	till; near surface	575358	6306886	26.90	0	0	0	2	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2509M	till; near surface	584326	6310533	31.50	0	1	0	6	0	0	0	1	0	6	0	0	7	0	0	1	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	7
2510M	till; near surface	580830	6308619	29.20	0	1	0	21	0	0	0	1	0	20	0	0	21	0	0	1	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	18
2511M	till; near surface	564059	6296083	25.95	18	2	0	12	0	40	16	2	0	10	0	35	63	2	0	0	0	0	0	0	0	11	0	0	0	0	0	0	6	0	0	0	19
2512M	till; near surface	588651	6308170	29.20	0	0	0	3	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3
2513M	till; near surface	572019	6311323	28.20	0	4	0	2	0	0	0	2	0	1	0	0	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2514M	till; near surface	571391	6308445	28.95	1	0	0	3	0	0	1	0	0	3	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2515M	till; near surface	567985	6292543	25.95	5	7	0	347	0	2	2	3	0	150	0	1	156	0	0	3	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	9
2516M	till; near surface	567900	6295898	28.35	99	3	0	150	1	18	94	3	0	142	1	17	257	0	0	3	0	0	0	0	0	11	0	0	0	1	0	10	3	0	0	0	28
2517M	till; near surface	576642	6297798	29.20	71	2	0	103	0	22	69	2	0	100	0	21	192	0	0	0	2	0	0	0	0	13	0	0	0	1	0	0	2	0	0	0	18
2518M	till; near surface	572027	6295531	24.75	2	0	0	182	0	0	2	0	0	150	0	0	152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2519M	till; near surface	574123	6296000	26.10	1	1	0	84	0	0	1	1	0	73	0	0	75	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2520M	till; near surface	584615	6315547	28.00	0	0	0	4	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4
2522M	till; near surface	581079	6316630	27.05	0	0	0	3	2	2	0	0	0	3	2	2	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	1	0	0	5
2523M	till; near surface	580900	6312307	26.85	0	0	0	8	0	1	0	0	0	7	0	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	0	0	0	8
2524M	till; near surface	588214	6311674	28.90	0	0	0	5	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	5
2525M	till; near surface	584210	6307402	28.45	0	2	0	3	0	1	0	2	0	3	0	1	6	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	6
2526M	till; near surface	583958	6303888	26.65	8	1	1	20	0	2	7	1	1	18	0	2	29	0	0	1	0	0	0	1	0	2	0	0	0	0	0	0	1	0	0	0	5
2527M	till; near surface	567780	6300003	27.70	0	1	1	3	0	0	0	1	1	3	0	0	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2528M	till; near surface	572670	6300642	26.30	0	3	1	0	0	1	0	3	1	0	0	1	5	0	0	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4
2529M	till; near surface	564477	6299302	31.00	59	2	0	19	0	35	61	2	0	20	0	36	119	1	0	1	0	0	0	0	0	23	1	2	0	0	0	0	0	0	0	0	28
2530M	till; near surface	572552	6315352	27.95	132	3	1	57	1	30	123	3	1	53	1	28	209	10	0	3	4	1	0	1	0	23	0	0	0	0	0	7	23	0	0	1	73
2531M	till; near surface	586410	6314337	28.60	0	1	0	4	0	0	0	1	0	4	0	0	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	4
2557M	till; near surface	571676	6292707	26.95	0	0	0	28	0	0	0	0	0	25	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotals:	till; near surface; no duplicates										1292	85	20	1714	18	723	3852	28	2	53	10	2	1	9	6	135	1	7	2	2	1	88	73	2	4	1	427

					Picked KIM Grains Normalized to 30 kg						Picked KIM Grains							Confirmed Grains (Mineralogy Based on Microprobe Data)																				
Sample	Sample Material	Easting	Northing	Original Sample Weight (kg)	Pyrope	Clinopyroxene (Cr-Diopside)	Eclogitic Garnet	Olivine	Ilmenite (Picroilmenite)	Chromite	Pyrope	Clinopyroxene (Cr-Diopside)	Eclogitic Garnet	Olivine	Ilmenite (Picroilmenite)	Chromite	Sum of Picked KIM Grains	Edenite/Pargasite	Magnesiohornblende	Cr-Diopside/Augite	Diopside	G0 Garnet	G1 Garnet	G3 Garnet	G4 Garnet	G9 Garnet	G11 Garnet	G12 Garnet	Grossular	Ilmenite	Ilmenite-Rutile	Forsterite	Chromite	Spinel	Tourmaline (picked as tourmaline)	Unknown	Sum of Microprobed Grains
2005M	till; duplicate probe analysis																	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2007M	till; duplicate probe analyses																	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2022M	glaciofluvial sand	576097	6301257	23.35	48	3	1	257	6	42	37	2	1	200	5	33	278	0	0	2	0	0	0	0	1	12	0	0	0	0	0	0	0	0	0	0	15
2533M	till; field duplicate of 2504M	579937	6303017	22.35	0	1	0	173	3	5	0	1	0	129	2	4	136	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2559M	rock; kimberlite K6; mantle xenolith	585271	6308871															0	0	10	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	20
2739M	till; hole BHH02-8; 25-33 m depth	575284	6302188															0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	10
Totals:	all samples										1329	88	21	2043	25	760	4266	29	2	68	10	2	1	9	7	147	1	7	2	2	1	108	73	2	4	1	476