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19970013

1997 ASSESSMENT SUMMARY

METALLIC AND INDUSTRIAL MINERAL PERMITS:

9393080543 TO 9393080547

FOR

656405 ALBERTA Ltd.

BY

A.C. GLATIOTIS, P.GEOL.

ON

NOVEMBER 25, 1997

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1. Introduction

This report documents the work accomplished at the claims outlined in Section 5 of this report. A combination of features documented in the initial assessment report make this area prospective for diamond potential. These features include:

- The underlying basement rock of the Loverna Block is Archean in age (>2.6 Ga);
- The government lithoprobe studies indicate the presence of a mantle root deeper than the one at Lac de Gras;
- Government airborne magnetic surveys reveal a prominent elliptical anomaly;
- Government gravity data indicate an anomaly coincident with the magnetic anomaly;
- Reconnaissance magnetic surveys indicate near surface magnetic anomalies;
- Surface sampling found diamond indicator minerals including; G5, G9, G10 and G11 garnets and CP5 clinopyroxenes which plot in the diamond inclusion field; and,
- Surface sampling turned up hand specimens suggestive of kimberlite emplacement.

The follow up assessment work documented in this report consists of:

- Ground based magnetic surveys;
- An airborne magnetic survey;
- A follow-up ground based magnetic survey over the most prominent magnetic anomaly;
- An orientation ground based EM34 survey over the same anomaly;
- An orientation electrical resistance tomography section across the same anomaly;
- The drilling of three exploration drill holes;
- Surface sampling, prospecting and test pitting; and,
- Examination of existing seismic data.

2. Conclusions

The conclusions based upon this second phase of assessment work include:

- Surface sampling confirmed the glacial character of surface materials on the property;
- Indicator minerals and rocks suggestive of a kimberlitic source were located on surface;
- Initial ground magnetic surveys outlined two anomalies in Lake 4 (see figure 2 for location);
- The aeromagnetic survey confirmed the existence of a large deep seated anomaly and indicated numerous shallow anomalies;
- Follow-up ground magnetic work over the most prominent aeromagnetic anomaly increased resolution of the data but revealed variances between the airborne and ground based anomalies;
- An EM34 survey was able to measure bedrock conductance through the glacial overburden with the coils in vertical mode. EM34 data were not correlative with the

magnetic anomalies in the area tested. The magnetic anomaly source is too deep for an EM 34 instrument in the area tested. EM surveys may be effective where kimberlite pipes are present at the base of the glacial overburden;
- The ERT section yielded results indicative of a bedded sedimentary sequence above the primary magnetic anomaly;
- Although drill holes did not penetrate kimberlite pipe breccias or magmatic phase rock, the presence of diamond indicator minerals, mafic and ultramafic lithic fragments and olivine grains in the core and drill cuttings strongly suggests local kimberlitic volcanism was a sediment source rather than volcanism associated with Laramide mountain building to the west; and,
- The boulder bed on the north shore of Clear Lake is due to erosion of clay till by wave action rather than by glacial fluvial processes. There is no placer concentration of heavy minerals.

3. Recommendations

Based upon the field program and data analysis the following recommendation are made:

- ERT sections should be conducted to cross the strongest airborne magnetic anomalies;
- Existing core should be assayed for diamond content; and,
- Verified pipe structures should be drilled, assayed and evaluated.

4. Location and Access

The mineral claim lies between 102^{O}02' and 102^{O}16' of longitude and 51^{O}45' and 51^{O}52' of latitude in T32, R15 and 16 and T33, R 15 and 16 west of the fourth meridian, centred on the Chain Lakes northwest of Hanna about 23 kilometres.

Access is by paved highway (#56) 22 kilometres north from Drumheller and 43 kilometres east on highway 9 to the intersection of gravel road (#855). Continue north 15 kilometres into the claim. The entire property is accessible by many gravel and dirt roads which service local farms. Wet conditions can make these roads impassable due to the amount of clay present.

5. Claim and Title

The claim consists of the following Metallic and Industrial Mineral Permits:

Permit #	Area	Expiration Date
9393080543	~~8,704.~~0 256	2003-08-26
9393080544	~~8,704.0~~ 2560	2003-08-26
9393080545	~~8,768.~~0 2304	2003-08-26
9393080546	~~8,768.0~~ 1792	2003-08-26
9393080547	~~8,625.~~0 4876	2003-08-26

Interest in the claim is as follows:

656405 Alberta Ltd.	82.6%
718709 Alberta Ltd.	7.0%
718730 Alberta Ltd.	5.4%
Halonen, Leo Edward	5.0%
Total	100.0%

6. Topography

Elevations on the claim range from 2,620 to 2,900 metres. The Chain Lakes occupy a wide glacial outwash valley which has a northwest trend and runs through the centre of the claim. To the northeast of the valley the surface is humocky and kettled while to the southwest the land is gently rolling. Valley slopes are gentle with occasional steep sided small gullies. The Chain Lakes are typically ephemeral, drying out by mid August except in unusually wet years. The lakes are alkaline forming salty mud flats when dry.

7. Geology

The property is underlain by approximately 2,100 metres of sediments of the Western Canada Sedimentary Basin deposited upon cratonic Archean rock of the Loverna block (GSC Bull 447, 1993). Figure 3 presents a west to east cross-section of the basin with a vertical arrow between Drumheller and Coronation indicating the position of the claims. The focus of this exploration program is the Upper Cretaceous which coincides with the Laramide orogeny to the west. Figure 4 summarizes the regional breakdown of formations in this time frame.

The surface materials covering the entire property are glacial in nature ranging from 10 to 50 m in thickness. The northwest trending valley occupied by the Chain Lakes is a geomorphological divide. To the northeast of the valley the terrain is strongly kettled. To the southwest is gently rolling till plain with glacial-fluvial channels which drained in a southwesterly direction. The valley occupied by the Chain Lakes appears to be a glacial outwash which formed at the toe of the retreating ice sheet at a point where the retreating ice stalled and became stagnant.

Directly underlying the Pleistocene glacial deposits are Upper Cretaceous rocks of the Edmonton and Bearpaw Formations which are the focus of interest in this report. These sediments belong to the Bearpaw-Cypress Hills megacycle, a regressive sequence due to uplift of the Laramide orogeny to the west which provided sediments deposited in the Bearpaw Sea. A progressively shallower sequence of environments is represented starting with the offshore Bearpaw shales progressing through littoral marginal marine, coastal plain and alluvial fan-braid plain upward to the Paleocene erosion surface. The shales of the Bearspaw wedge out westward. The Edmonton Formation thickens westward and in combination with the Belly River Formation becomes the Brazeau Formation.

The Edmonton Formation is stratigraphically complex. The outstanding features of this formation are:

- pronounced lensing and interfingering of strata so no two sections are identical;
- a great amount of bentonite in the beds; and,
- the presence of numerous coal seams.

Allen and Sanderson (1945) break the Edmonton Formation into three members (Fig. 5). The Lower Member is 200 m thick. It is comprised of bentonitic sands and shales, numerous coal seams and scattered fossiliferous limestone beds. This unit correlates to the Horseshoe Canyon Formation of Irish (1970). The Middle Member is 100 m thick. It consists of bentonitic sands and shales with fewer coal seams. The Kneehills tuff is a marker horizon at the top of the unit ranging from 0.15 to 0.3 m thick. It is found over 700 miles across southern and central Alberta. M. Shafiqullah (1963) assigned an absolute age of 66 million years to the tuff. P.L. Binda (1969) demonstrated progressive fining of median grain size in the tuff with distance north from the U.S.- Alberta border, indicating a southern source for the tuff. The Upper Member also consists of sands, shales and coal seams. Fossils of Triceratops, Tyrannosaurus, Thescelosaurus and Ankylosaurus have been found in Upper Member sediments above the Kneehills tuff (Sternberg, 1947). The top of the Edmonton Formation is an erosion surface.

The Bearpaw Formation is gradational with the overlying Edmonton Formation consisting of bioturbated basinal shales and silts.

The bentonitic component of the Edmonton formation has been widely considered to be the result of volcanism associated with the Laramide orogeny and mountain building in the west. Erosion has removed all of the sediments of the Upper member and some of the Middle member to a level below the Kneehills Tuff. What remains of the Edmonton Formation is equivalent to the Horsehoe Canyon Formation described by Irish (1970). Appendix I contains the detailed section done by Irish.

7.1 The Sweetgrass Arch

The Sweetgrass Arch plunges northward from the Kevin-Sunburst Dome into southeastern Alberta where it meets the south plunging Bow Island Arch. A break between the arches is called the Suffield Saddle. Figure 6 locates the position of these features relative to the property.

The modern expression of the arches is erosion of progressively older strata over the arch axis. The arches have a long and complex history which extends back to the Precambrian. They arose as a flexed hinge for shelf sedimentation on the western continental margin of the craton. Subsequently, the hinge was amplified by sedimentation from western sources. Lorenz (1982) suggested that episodic thrusting in the fold and thrust belt depressed the lithosphere, displacing mantle which further elevated the arch along pre-existing zones of weakness.

During the Laramide orogeny the combination of sediment loading in the basin, which would further have flexed the arches, and compressive structural forces, due to mountain building, may have penetratively fractured the crust in such a way as to create pathways to the surface for kimberlitic magmas.

8. Geophysics

8.1 Introduction

A prominent magnetic anomaly centred in the claims was obvious in airborne magnetic surveys performed by the government (Ross 1995). The magnetic anomaly is coincident with a gravity anomaly also revealed by government data (Ross 1995, p.210). Previous reconnaissance magnetic work confirmed the large scale magnetic anomaly and identified near surface magnetic signatures which could be due to the presence of near surface kimberlite pipes (Haimila, 1995).

Two ground based surveys were conducted early in 1997 to follow up on the reconnaissance work. Lake 4 and Pearl Lake were surveyed early in 1997. High diurnal magnetic fluctuations rendered the data collected during the Pearl Lake uninterpretable.

An airborne magnetic survey was undertaken to cover the entire property. A prominent strong deep anomaly was delineated which corresponds well with the larger scale government surveys. Filtering of the data set revealed numerous anomalies closer to the surface. The most prominent filtered aeromagnetic anomaly was targeted for a detailed follow-up magnetic survey. An EM34 survey and an ERT section were undertaken to verify the airborne magnetic data. A cursory examination of existing seismic data sought to establish some correlation with the magnetic data.

8.2 Initial Ground Magnetic Surveys

Two ground based magnetic surveys were carried out using a caesium vapour magnetometer to follow up on data gathered during reconnaissance work. Data are contained in Appendix III. 11

In February of 1997 a baseline was established on Lake 4 (the small lake east of Clear Lake) using a north-south fence line which runs into the lake. Lines were run perpendicular to the fence line at 50 metre intervals to 700S. Magnetic readings were taken at 25 metres intervals. When anomalous readings were encountered infill readings were taken around that location. Diurnal magnetic drift was corrected for by surveying closed loops to an established base point. Superimposed upon a background of magnetic values which increase westward are two localized magnetic irregularities, A and B, of similar magnitude (Fig. 7).

In March of 1997 a baseline was established using an East-West fence parallel to the road in order to follow up reconnaissance anomalies on Pearl Lake. Lines were run perpendicular to the fence line every 50 metres. Readings were collected every 25 metres along the grid lines. Wherever anomalous values were encountered infill readings were taken in the vicinity. Diurnal magnetic fluctuations were too high and too rapid during the day for the data to be corrected.

8.3 Airborne High Resolution Magnetic Survey

The aeromagnetic survey was performed by Spectra Exploration Geoscience Corp. The area covered is bounded by the coordinates 51^{0}45'N to 51^0 52.1'N and 112^0 3.5'W to 112^{0}15'W. The survey was flown 100 meters above the ground surface on a North-South grid with lines spaced 200 metres apart. East-West cross lines were flown every kilometre to tie in the grid. 948 line kilometres were flown on the survey lines and 199 line kilometres were flown on tie lines for a total of 1,147 line kilometres.

The geophysical system was carried by a Piper Navajo aircraft flying at 70 metres per second yielding one magnetic reading every 7 metres. The primary geophysical system was a high sensitivity, caesium vapour magnetometer. Support equipment included a tri-axial fluxgate magnetometer, video camera, video recorder, radar altimeter, barometric altimeter, GPS receiver and navigation system which records real time flight path information.

A high sensitivity caesium vapour base station magnetometer was employed to correct for diurnal fluctuations in magnetic field strength due to solar activity. Time synchronization was accomplished with a GPS receiver. Ground GPS data from the base station was used to correct flight path data.

A large elliptical magnetic anomaly was delineated ranging from 57790 to 58195 gammas. Filtering revealed near surface anomalies of interest as exploration targets (Maps 1 and 2).

8.4 Follow-up Ground Magnetic Surveys

A survey grid was established using the fence line, parallel to the road running north from Clear Lake, as a baseline. Grid zero was located at the south post of the gate providing access to the field. Grid lines were run perpendicular to the baseline every 50 metres. Pickets were posted every 100 metres with pin flags set at 20 metre intervals.

A GSM-19 Overhauser memory magnetometer/gradiometer was used for measurement of total magnetic field and magnetic gradient in the survey. The device functions as a proton head magnetometer which has been modified for continuous data acquisition. Readings were continuously collected as the lines were traversed yielding a data density of 1 reading per metre.

A total field magnetometer measures the intensity of the earth's magnetic field in units of nanoteslas (nT). Ferromagnetic materials, occurring in the earth's magnetic field, tend to alter the field. Such materials, therefore, can be recognised as total field anomalies. The strength of the anomaly will be dependant largely on the mass of the ferromagnetic material and the depth of burial. Kimberlites often disturb the background total magnetic field causing anomalies in the order of tens of nanoteslas.

A magnetic gradiometer measures the change in total magnetic field between two sensors mounted at different heights above the ground. Gradient measurements have the advantages of being more sensitive to very near surface formations and being unaffected by diurnal changes in the earth's magnetic field. Gradient measurements, however, have a shallower depth of investigation than total field measurements.

The survey revealed a buried pipeline running parallel to the baseline. This was filtered out of the final plot of the total field data (Fig. 8). The survey was conducted on the east flank of the primary aeromag anomaly. The large scale features of the survey are similar to the aeromag data with readings ranging from 58740 to 58794 nT. There is considerably more character in the ground based survey than seen in the aeromagnetic map. The irregularities seen on the surface of the much larger anomaly indicates magnetic sources closer to the surface.

8.5 EM34 Survey

A trial EM34 survey was undertaken to determine whether a prominent aeromagnetic anomaly could be verified by measuring shallow electrical conductivities of the subsurface. A Geonics EM34 instrument was used to collect terrain conductivity data.

Terrain conductivity is defined as the bulk electrical conductivity of the subsurface. It is a measure of the combined electrical conductivity of the soil matrix and pore fluids. Typically, electrical conductivity is greater for finer matrix grain sizes (*i.e.*, clays are more conductive than sands, and shales are more conductive than sandstones). Additionally, high total dissolved solids (i.e. "salts") in the pore fluids will increase terrain conductivity.

Terrain conductivity instruments use the principles of electromagnetic induction to measure the electrical conductivity of the soil. A transmitter coil induces electrical current to flow in the subsurface. A receiver coil measures the strength of this current which, under a limited range of conditions, is directly proportional to the conductivity of the soil.

Generally, the depth of investigation of an electromagnetic (EM) device is a function of transmitter - receiver intercoil spacing and the dipole (or coil) orientation. The EM34, with an intercoil spacing of 40 metres has a maximum depth of investigation of 60 metres in the vertical dipole mode and 30 metres in the horizontal mode.

In the horizontal mode the EM34 was not able to penetrate through the glacial till. Highly alkaline soils gave rise to readings of high conductivity. In the vertical mode the conductivity of the underlying bed-rock was determined (Fig. 9). No correlation exists between the EM survey and the magnetic data. The source of the magnetic anomaly is below the range of this instrument in the location surveyed.

8.6 ERT Survey

Electrical Resistance Tomography is technique for mapping the distribution of subsurface electrical resistivities in a cross-sectional format. Data are collected through a linear array of 61 electrodes coupled to a DC resistivity transmitter-receiver with an electronic switching box. The collection and recording process is driven by a laptop computer. The data are inverted using a 2-D finite difference inversion routine. The final product is a two dimensional cross-section which plots conductivities in milliSiemens per meter (mS/M) versus depth.

One ERT line was run on the 250S using 1.2 Km of cable. It extended from the fence line (0) westward to the far shore of Lake 6 (1200), cutting across the primary aeromagnetic anomaly and terminating in a secondary anomaly (Fig. 10) Surface water had evaporated and the silts were desiccating with the formation of mud cracks. Lake sediments were still wet enough that they could only be traversed using snow shoes.

The section reveals flat lying sediments which appear to drape down on either side. Edge effects and lack of data control point are responsible for the vertical nature of the anomalies.

8.7 Seismic

An attempt was made to utilize reflection seismic profiles to locate diatremes and pipes on the claims. Prior to possible purchase of the appropriate coverage in the area a quality inspection of seventeen lines was undertaken by Dr. N. Haimila, R. Haimila and A. Glatiotis.

During the inspection it was determined that the resolution at shallow depths was not good enough for the intended purposes. Also, the commmon depth point processing used in the petroleum industry focused on horizontal and subhorizontal events and tended to nullify most vertical events except for faults that offset bedding.

It was observed that deep within portions of the seismic sections there were large arched events. Additionally, diffraction patterns on some of the seismic lines were concentrated in sections 19, 20, 29 and 30 of township 32, range 15W4 and sections 14, 23 and 24 of township 33, range 15W4. Although these features are not definitive, they appear in the areas where other geophysical methods indicate anomalies.

9. Drilling

9.1 Introduction

Three holes have been drilled to date on the property. In 1995 a vertical hole was drilled under the supervision of 656405 Alberta Ltd. to a total depth of 386 feet. Two holes were drilled in 1997. Borehole 97-1 was located over a magnetic high obtained from the ground based magnetic survey which was a follow-up to the aerial survey. Borehole 97-2 was drilled at -45° to test a magnetic high mapped by an initial ground magnetic survey over Lake 4 which revealed an anomaly which was not present in the filtered airborne maps.

9.2 1995

The 1995 drill program, managed by the property owners, targeted one hole over the highest magnetic readings obtained by orientation magnetic data. A vertical hole was collared on the east side of the road that passes between Lake 4 and Clear Lake just north of the lakes (Fig. 2).

A tricone was used to a depth of 315 feet because the bed-rock was soft. Drill cuttings from the upper part of the hole were not sampled, losing valuable information in lithologies of interest. The rest of the hole, to a total depth of 386 feet, was cored using a 3" split tube core barrel. A clay rich interval in the upper part of the hole was described as having a blue colour. This material could have been kimberlitic in nature.

A section of core from 332 feet consisted of green glauconitic sandstone with matrix supported mudstone clasts (Photo 2). This may represent a submarine landslide. One clast at the top of the section deformed sediment under it in such a way as to suggest it was dropped into place. The remaining core from 320 to 334 feet was bentonitic sandstone with occasional large sandstone or mudstone clasts. Coally fragments are abundant. Grains of pink garnet, green pyroxene, mica (black, brown, yellow and green) and sapphire were identified using a binocular microscope. Thin sections confirmed the presence of garnet and olivine grains along with altered mafic rock fragments. Some textural features suggest the emplacement of the sediments is due to landslides in a shallow water environment. The sediments are reworked volcanics with diamond indicator minerals present. The environmental mechanism needed to explain this combination of features is proximity to a nearby kimberlitic volcanic crater rim.

9.3 1997

Two exploration holes were cored with a TH 60 Ingersol Rand drill-rig. Core was recovered with a 3" split core-barrel and a wireline. Hole 97-1 was collared north of Clear Lake and drilled vertically to a depth of 252 feet. Hole 97-2 was collared east of Lake 4 and angled at 45^0 from the horizontal to drill through a magnetic high under the lake (Fig 2) determined by the initial magnetic survey.

Hole 97-1 drilled through a typical section of Edmonton Formation; interbedded, bentonitic sands, silts, coal and muds. The sequence is typical of a near shore shallow marine/deltaic environment with a high volcanic component. Drill cuttings were periodically panned as the hole was being drilled. Likewise sections of core were shaved and panned to determine what heavy minerals were present. Garnets were abundant in the upper part of the hole. Blue sapphires and clinopyroxene grains were found. Marcasite worm casts and diatoms were abundant as was magnetite. Fewer indicator minerals were found in clean, well sorted sands at the bottom of the hole. Drill cuttings were caught and retained for future analysis.

Hole 97-2 was cored to 242 feet where core retrieval became impossible. The core would not lock into the core barrel but would slip out when the barrel was retrieved on the wireline. The softness of the sediment and the high bentonite content contributed to this problem. The only way to retrieve the core was to over-drill until the core barrel split. The core barrel would then jam inside the drill string making retrieval difficult. Coring was abandoned in favour of conventional drilling to a depth of 677 feet where coring resumed. The hole was drilled to a total depth of 723 feet. The rate at which the drill angle steepened was higher for conventional drilling than for coring. As a result, the hole did not reach to the target magnetic anomaly. The cored top section was similar to hole 97-1. Drill cuttings were retained from the section which was drilled conventionally but have not been logged. The middle section consisted of very fine grained muds and silts which had a tendency to wash away altogether. When coring resumed it was in finely laminated, bioturbated, mud and claystones which are probably correlative to the Bearpaw Formation.

9.4 Palynological Age Determinations

Samples of core from drill holes 95-1 and 97-1 and 97-2 were submitted to Branta Biostratigraphy Ltd. for palynological age determinations (Appendix IV). From drill hole 95-1 samples were submitted from 314 feet and 322 feet depth (the glauconitic section seen in Photo 2). From hole 97-1 a sample was submitted from 174 feet depth. From hole 97-2 a sample was submitted from 100 feet depth. All samples yielded determinations of Late Campanian to early Maastrichtian age.

10. Mineralogy and Geochemistry

10.1 Introduction

Previous surface sampling recovered G1, G2, G5, G9, G10, G11 garnets of both eclogitic and peridotitic origin; CP5 chrome diopsides in the diamond inclusion field and phlogopite flakes which plot in the kimberlite field. Various rock grab samples from the glacially modified surface had textures and compositions which strongly suggest kimberlitic origin (Haimila, 1995). Surface prospecting and sampling was undertaken to confirm these findings. Mineral grains were hand picked from core of hole 95-1 and analysed. Drill cuttings from 95-1 were concentrated and analyzed for indicator minerals. Drill cuttings from holes 97-1 and 97-2 were concentrated and analysed for indicator mineralogy. A sandstone interval from 97-2 was split, crushed, concentrated and analysed for indicator mineralogy. Thin sections were cut from drill holes 95-1, 97-1 and 97-2. Petrographic analysis of these sections is only partially complete but has encouraging results.

10.2 Surface Sampling

Three samples were taken of surface materials. 10001 was a 5 gallon bucket of beach sands taken from the south shore of Clear Lake. 10002 was a 5 gallon bucket of beach sands taken from the north east shore of lake 6. 10003 was a 5 gallon bucket of beach sands taken from the south east shore of Pearl Lake (Fig. 2).

Sample 10001 was submitted to Loring Labs for concentration, magnetic separation, grain picking and analysis. 22.2 Kg of sample were screened. The +35 mesh and the -80 mesh material was discarded. 16.4 Kg of +80 mesh was concentrated using the Wilfley table yielding 289 grams of concentrate. Using heavy media the concentrate was separated into three density categories; SG<2.9, SG 2.9-3.3, SG>3.3. The light fraction was discarded. The middlings were magnetically separated into magnetic and nonmagnetic parts. A Franz Magnetic Separator was used to classify the heavies into magnetic, paramagnetic, weakly paramagnetic and nonmagnetic categories.

A total of 64 indicator mineral grains were picked including: 7 garnets, 43 Cpx, 6 ilmenites, 1 chromite and 7 olivines. Fifteen grains were analyzed yielding: 5 G5 garnets, 3 Zn-spinels, 1 epidote, 2 tourmalines and 4 ilmenites (Appendix VI-D). Tourmaline, epidote and Zn-spinel grains were misidentified as clinopyroxene and olivine. The chromite grain was submitted for assay but disappeared. One of the tourmalines plot in the Group I kimberlitic field for tourmalines (Fig.20). One low chrome garnet has 0.06 wt% Na_2O which is close the levels recognized as deriving from lithospheric mantle.

A boulder bed on the north shore of Clear Lake (Photo 3) was initially thought to represent a glacial-fluvial deposit which might have concentrated indicator minerals. About two pounds of sand and gravel was panned by hand to concentrate heavy minerals. A rolled flake of gold about .5mm in diameter was found with an abundance of magnetite, garnets, pyroxenes, and amphiboles. A bulk test of the boulder bed was planned to evaluate the concentration of heavy minerals at this location.

10.3 Bulk Test Pits

A bulk test was conducted at grid coordinates 600S, 450W; just back from the boulder bed on the north shore of Clear Lake. The objective was to dig through and sample the horizon which gave rise to the boulder bed on the lake shore. It was thought that the boulder bed might be a glacial-fluvial channel which may have concentrated heavy minerals.

A 14.5 foot deep pit was dug with a backhoe. No glacial-fluvial gravels were encountered. The top 5 feet were medium to coarse grained, well sorted, loose sand with some silt, possibly lacustrine in origin. From 5 to 14.5 feet was chocolate brown, silty clay till. Boulders, cobbles and gravel sized material were supported in a matrix of clay. Several gneiss boulders had deteriorated to granular gravel in situ within the clay. Occasional silty lenses were present in the till. The boulder bed developed through the erosive action of waves removing fine grained material from the till rather than from glacial-fluvial sorting

Material from all horizons were loaded into a cement mixer. Water was added at a steady rate to carry away the fines in suspension. Material too coarse to wash away was caught in buckets and retained. The sample was seived into various size fractions and concentrated in a Pleitz jig. Results of heavy mineral separation are pending.

Diamond indicator minerals and kimberlitic rock specimens found in the boulder bed were also released from the till.

A second test pit was dug at 300S, 500W to a total depth of 13 feet. The entire hole was in clean, yellowish, glacial-lacustrine silts with occasional drop stones. Gypsum roses were common. Samples were bagged without washing and retained for mineral separation. The silt was later seived but was too fine to be concentrated by the Pleitz jig.

10.4 Rock Grab Samples

Two ultramafic specimens of very high metamorphic grade were recovered from the boulder bed on the north shore of Clear Lake. Sample #001 (Photo 5; labelled RH1 in Fig.11) is a garnet pyroxene gneiss with a specific gravity of 3.46. Sample #002 (Photo 6; labelled RH2 in Fig.11) is a garnet pyroxenite with a specific gravity of 3.64. Both samples contain G5 garnets with elevated sodium content. One garnet (grain 9 in sample #002) plots just inside the diamond inclusion field for eclogitic garnets (Fig.13). The clinopyroxenes in both samples are potassic and were classified as eclogitic by C.F. Mineral Research Ltd. (Fig.11). One clinopyroxene (grain 10 in sample #002) plots in the diamond inclusion field for eclogitic low chrome diopsides (Fig.12). Plotting Cpx K_2O versus Na_2O in the garnets places both of these specimens in the field of Group I kimberlites (Fig.14). Both specimens are probable chemical equivalents of basalt or gabbro.

Several specimens were collected which have the appearance of conglomerate but fall into the categories of milled volcanic breccia to lithic lapilli tuff. Specimen #008 (Photo 6) is an example in which well rounded crustal fragments are supported in a sandy matrix. The observed texture is as explainable by kimberlitic volcanism as by strictly sedimentary processes.

Sample #016 is one example of many coarse grained crystal tuff boulders that were found. In this specimen mafic and felsic lapilli fragments are supported in a sandy matrix of crustal minerals which includes red garnets (almandine). Although bedding was not well developed in this example, other samples were found with bedding well defined. Numerous examples of pyroxene crystal tuff (Photo 8) were also located.

Several examples of volcanic breccia were found with a texture that is almost mylonitic in nature. Specimen #015 (Photo 9) is a good example. The manner in which the fine grained mafic matrix appears to flow around felsic xenoliths suggests the material was moving very quickly prior to lithification.

Numerous rocks and boulders of dark grey phlogopite porphyry were also located. These have been described alternately as minettes and kimberlites by geologists familiar with these lithologies. Samples R1, R3, and R5 were collected from the boulder bed on Clear Lake. R5 was collected from Pearl Lake. All were submitted to Ashton Mining Canada

Inc. for identification (Appendix VI- F). Ashton in turn submitted them to Min-En Labs for whole rock ICP analysis. All four samples have the composition of lamproite.

Another igneous lithology is present in weathered tills in anomalous quantities. Sodalite and cancrinite bearing syenite rocks are abundant. No surface outcrops are known of this rock type in the upstream direction of ice movement.

The abundant hand samples, suggestive of kimberlitic origins, discovered on surface may have a local source coincident with magnetic anomalies delineated by the geophysical studies.

10.5 Drill Cuttings and Core

10.5.1 Drill Hole 95-1

A 19.6 Kg composite sample of drill cuttings, which were retained during the coring portion of drilling, was submitted to Loring Labs for heavy mineral concentration, magnetic separation, mineral picking and analysis (Appendix VI-A). Two garnet and 2 Cpx grains were picked.

A second 37 Kg composite sample of drill cuttings was also submitted for the same analysis. Additionally, half the sample was split and submitted for ICP whole rock analysis including rare earths. Eight grains were picked and analysed yielding 4 garnets, 3 Cpx and one blue sapphire corundum (Appendix VI-B). An additional 8 grains were picked from this sample and microprobed yielding: 3 garnets, 3 Cpx, one sphene and 1 spinel. 5 garnets were classified as G5 and 2 as G8. Five Cpx grains were classified as CP2 and 1 CP8.

All the Cpx grains plot in the diamond inclusion field for low chrome diopsides (Fig. 16). Notably, CP8 clinopyroxenes have hitherto only been identified as inclusions in diamonds and never in matrix kimberlite or lamproite (Fipke et. al. 1995, GSC Bull. 423, p.65). None of the garnets plot in the diamond inclusion field but are an unusual occurrence in sediments deposited so far from the Canadian Shield in the Western Canada sedimentary basin.

Figure 15 compares REE values from the 95-1 drill cuttings sample with values found at Mir and in an average kimberlite (Mitchell 1989). A marked similarity with the Mir kimberlite pipe are apparent. This suggests the volcanic sediments have a strong kimberlite component.

R. Haimila picked 10 grains from the core: 4 of which are garnets; 3 were staurolite, 1 was titanite, 1 was plagioclase and 1 blue crystal was too small to be analysed. The garnets were classified as: 1 G3, 2 G5 and 1 G8 (Appendix VI-B). None of the garnets plots in the eclogitic diamond inclusion field for Na_2O vs TiO_2. One garnet, grain 106 F, plots in the eclogitic diamond inclusion field for CaO vs TiO_2 (Fig.18).

In order to assay some picroilmenite, ilmenite and chromite examples R. Haimila also picked a number of dark coloured grains from the magnetic separations of the hole 95-1 cuttings sample. These were mounted, polished and microprobed (Appendix VI-B). Of the 11 grains selected there were: 2 chromites, 1 ilmenite, 1 Ti-magnetite, 3 altered Fe-Ti oxide/hydroxides, 3 rutiles and 1 allanite.

Both chromites, plot in the Argyle field (Fig. 19). Allanite is a REE mineral which is chemically reactive. It could only be found in this location if it were volcanically emplaced.

A variety of interesting mineral grains were hand picked from coarser sandstones in hole 95-1. These were submitted to M. Glatiotis for semiquantitive SEM/Kevex analysis (Appendix VI-E). The presence of sapphire was confirmed.

10.5.2 Drill Holes 97-1 and 97-2

Drill cuttings were collected while hole 97-1 was being drilled. 372.4 Kg of cuttings were submitted to Loring Labs for heavy mineral concentration, magnetic separation, mineral picking and analysis. A total of 208 indicator minerals were picked including: 98 garnets, 71 Cpx, 14 ilmenite and 25 olivine. 7 gold grains were also picked from the sample. Of 17 grains submitted for microprobe analysis; 5 were staurolite, 5 were garnet, 5 were tourmaline and two were apatite.

Of the garnets that were microprobed 4 are G7 and 1 is G11. G7 and G11 garnets derive from peridotite source rocks. The presence of these garnets indicates a volcanic source with an ultramafic component.

Figure 20 plots K_2O versus TiO_2 content of the tourmaline grains and compares them with tourmalines found in a variety of diamond pipes. All the tourmaline grains are potentially pseudomorphous after Group I and II Cpx which argues favourably for a kimberlitic source for these grains.

The gold grains are visible nuggets and flakes up to 1.5 mm long. They are surprisingly coarse considering the fine grained nature of the sandstones from which they derive. Gold is commonly found in volcanic horizons in Alberta.

Three samples were taken from drill hole 97-2 for heavy mineral separation and analysis. One composite sample was made from the drill cuttings from the top half of the hole (97-2A) and another composite sample was made from drill cuttings from the bottom half of the hole (97-2B). Both samples filled one five gallon pail each. Sample 97-2 was half of the split core from a sandy interval at the bottom of the hole between depths of 370 and 386 feet. The samples were submitted to Loring Labs for heavy mineral separation, classification into magnetic categories, mineral picking and microprobe analyses.

Eight mineral grains were picked from 97-2A but 10 grains were analysed. 10 mineral grains were picked from 97-2B but only five were analysed. Incorrect labelling or a transposition error was made in reporting at Loring Labs. From sample 97-2, 19 grains were picked as ilmenites, none of which were actually ilmenites but were pyroxene, tourmaline and spinel. Also, grains picked as Cpx from samples 97-2 A and B were actually tourmaline and spinel.

The Cpx grains were correctly identified as **low chrome** diopsides by Loring Labs but were plotted on the chart for **high chrome** diopsides thereby misidentifying the significance of the grains (Appendix VI-D). When plotted on the correct chart only one of the Cpx grains from drill hole 97-2 plotted outside the diamond inclusion field (Fig.19); a substantial error.

The tourmaline grain from sample 97-2 plots in the field for tourmalines potentially pseudomorphous after Group I Cpx (Fig. 20). Loring Labs gives no indication of the significance of tourmalines in their report (Appendix VI-D).

10.6 Thin Section Analyses

10.6.1 DH 95-1

Four polished thin sections were made at the University of Calgary from the core of DH 95-1 at depths of 320', 372' and 384'. The notable features are:

- angularity of quartz shards and feldspar grains;
- presence of mafic, and ultramafic lithic fragments;
- presence of olivine, pyroxene and garnet grains;
- pseudomatrix of lithic fragments that have altered to bentonite and
- detrital dolomite and siderite.

The slide which best demonstrates the olivine and mafic lithic fragments was cut parallel to bedding in a coarse grained lamination (Photo 11). The sediments were deposited proximal to a volcanic source. Olivine grains travel no farther than three kilometres in sedimentary environments before chemically weathering away. The macroscopic textures are sedimentary but the angularity of the grains is evidence that there was relatively little sedimentary reworking before deposition.

10.6.2 Hand Specimens

Five polished thin sections were prepared at the University of Calgary from hand specimens: #002, #003, #006, #009, and #019.

- Sample # 002 (Thin section photos 25 and 26; hand specimen photo 6): Garnet pyroxenite of eclogite grade metamorphism was found in the boulder bed on the north shore of Clear Lake. Specific gravity is 3.64. Mineral Research microprobed 11 grains from this specimen (RH2 in Fig.11). Five grains were G5 almandine garnets, three were eclogitic clinopyroxenes, one was ilmenite and the remaining two were quartz. One cpx plotted in the diamond inclusion field for low chrome diopsides (Fig.12). One garnet plotted in the diamond inclusion field for eclogitic garnets (fig.13). The garnets are sodic and the clinopyroxenes are potassic. A chart comparing those features indicates both group I and II kimberlite composition. This rock was subject to eclogitic facies metamorphism in the diamond stability field. Its original composition was probably basalt or gabbro.

- Sample #003 (Thin section Photos 27 and 28) is a high grade metamorphic rock found on the north shore of Lake 4. This specimen has a specific gravity of 3.05. In hand specimen there appeared to be corundums pseudomorphous after plagioclase. The grains have feldspar twinning but show a conchoidal fracture which is not characteristic of feldspar. Corundum replacing plagioclase indicates pressures in excess of 10 Kbars. In thin section the plagioclase is cloudy with extremely corroded edges. Metamorphic garnet, amphibole and pyroxene developed at the expense of the plagioclase.

Specimen #006 (Thin section photos ~~29~~ 23 and ~~30~~ 24) is a high grade, banded metamorphic rock found on the east shore of Pearl Lake. The primary components are: hornblende, quartz, almandine and zoisite.

Thin section examinations were performed by Beth Haverslew. Examination of the remaining thin sections is not yet complete. Additionally, 34 thin sections were prepared by Mount Royal College from drill holes 97-1 and 97-2 and hand specimens. A report of these examinations is still pending.

11. Statement of Expenditures

Management:		$ 15,000.00
Geology:		
Literature Search: 16 hours @ $60.00/hour		$ 960.00
Biostratigraphic Analyses: 4 @ $181.90		$ 727.60
Geophysics:		
Spectra Airborne Magnetic Survey		$ 14,526.32
Drilling:		
1995		$ 15,000.00
1997		$ 30,251.73
Reclamation and Test Pits		$ 500.00
Laboratory Analyses		
Loring Labs:		$ 6,008.14
Ashton Mining		$ 756.51 ✓
[redacted]		$ 150.00
[redacted]/U of C Contract Services		$ 160.50
Thin Sections		
U of C. Slide Preparation:	6 @ $ 64.20	$ 385.20
M.R.C. Slide Preparation:	34 @ $ 35.00	$ 1,190.00 ✓
[redacted] examination:	5 @ $100.00	$ 500.00
718709 Alberta Ltd.		
Labour, ground mag., EM34, ERT, supervision, prospecting, etc		$ 57,407.70 ✓
Report Preparation		$ 5,000.00 ✓
Total Assessment Cost		$148,528.70

Constantine Glatiotis

A. C. Glatiotis, P.Geol.

12. Statement of Qualifications

I, Andreas C. Glatiotis of Calgary, Alberta do hereby certify that:

1. I am a consulting geologist with a business address at:
   5643 Brenner Crescent NW, Calgary, Alberta, Canada;
   phone/fax: (403) 282-0145;
   E-mail: glatiota@cadvision.com.

2. I am a graduate of The University of Calgary:
   Department of Geology (B.Sc. 1977)

3. I have practised my profession in mineral exploration and development for the past 20 years.

4. I am a member in good standing of the Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA).

5. I have based this report upon information provided to me by 656405 Alberta Ltd. and upon work performed by me or under my supervision in 1997.

6. I have an indirect interest in this property as an investor in 718709 Alberta Ltd.

Signed and dated this 25th day of November, 1997 at Calgary Alberta.

Andreas Constantine Glatiotis

A.C. Glatiotis, P.Geol.

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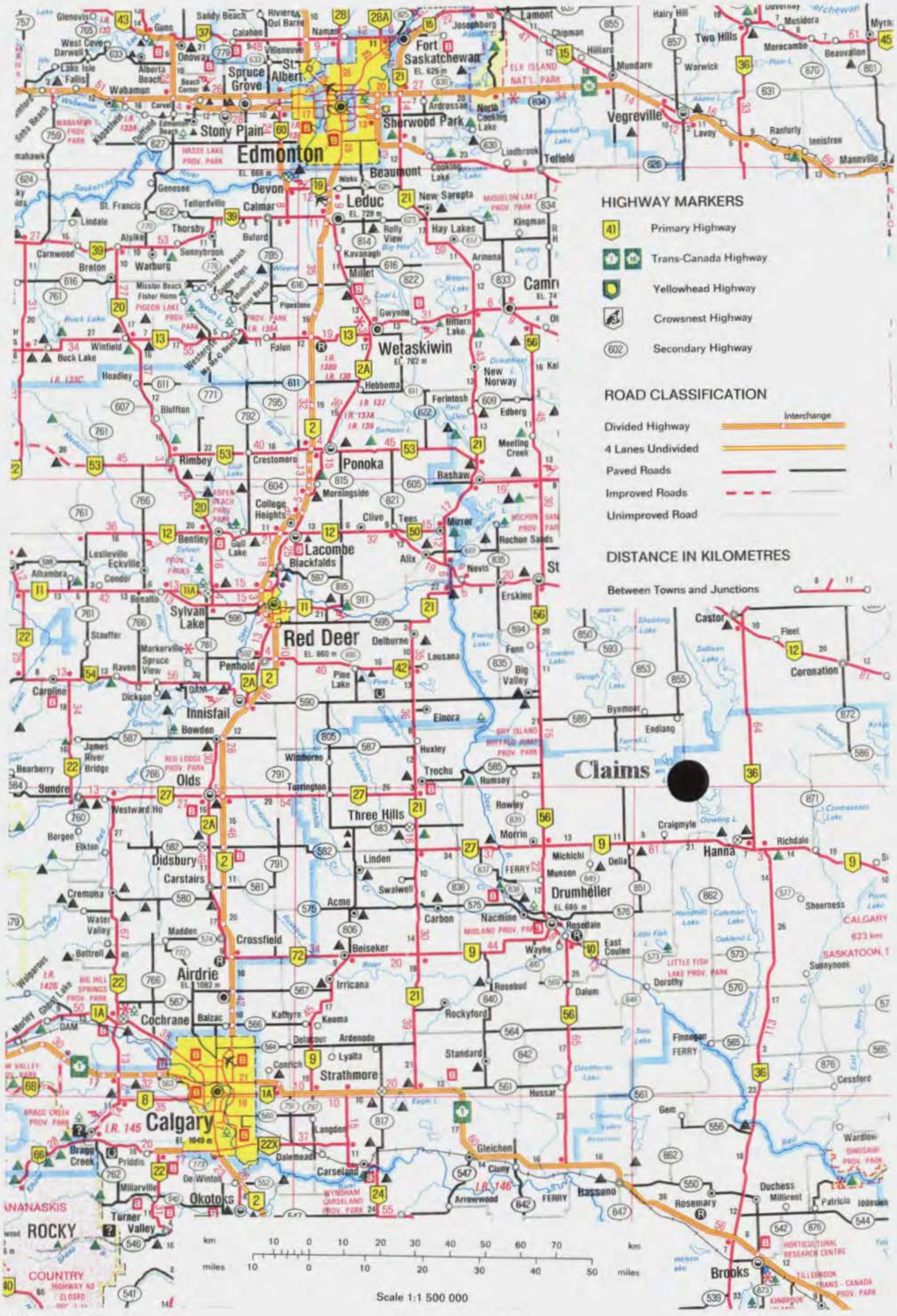

HIGHWAY MARKERS
Primary Highway
Trans-Canada Highway
Yellowhead Highway
Crowsnest Highway
Secondary Highway
ROAD CLASSIFICATION
Divided Highway
Interchange
4 Lanes Undivided
Paved Roads
Improved Roads
Unimproved Road
DISTANCE IN KILOMETRES
Between Towns and Junctions
Claims
Edmonton
Red Deer
Calgary
Drumheller
Hanna
Castor
Coronation
Three Hills
Trochu
Olds
Innisfail
Wetaskiwin
Ponoka
Lacombe
Leduc
Strathmore
Brooks
Vegreville
Camrose
Stettler
Airdrie
Cochrane
Okotoks
Bassano
Scale 1:1 500 000
km
miles

Figure 1:

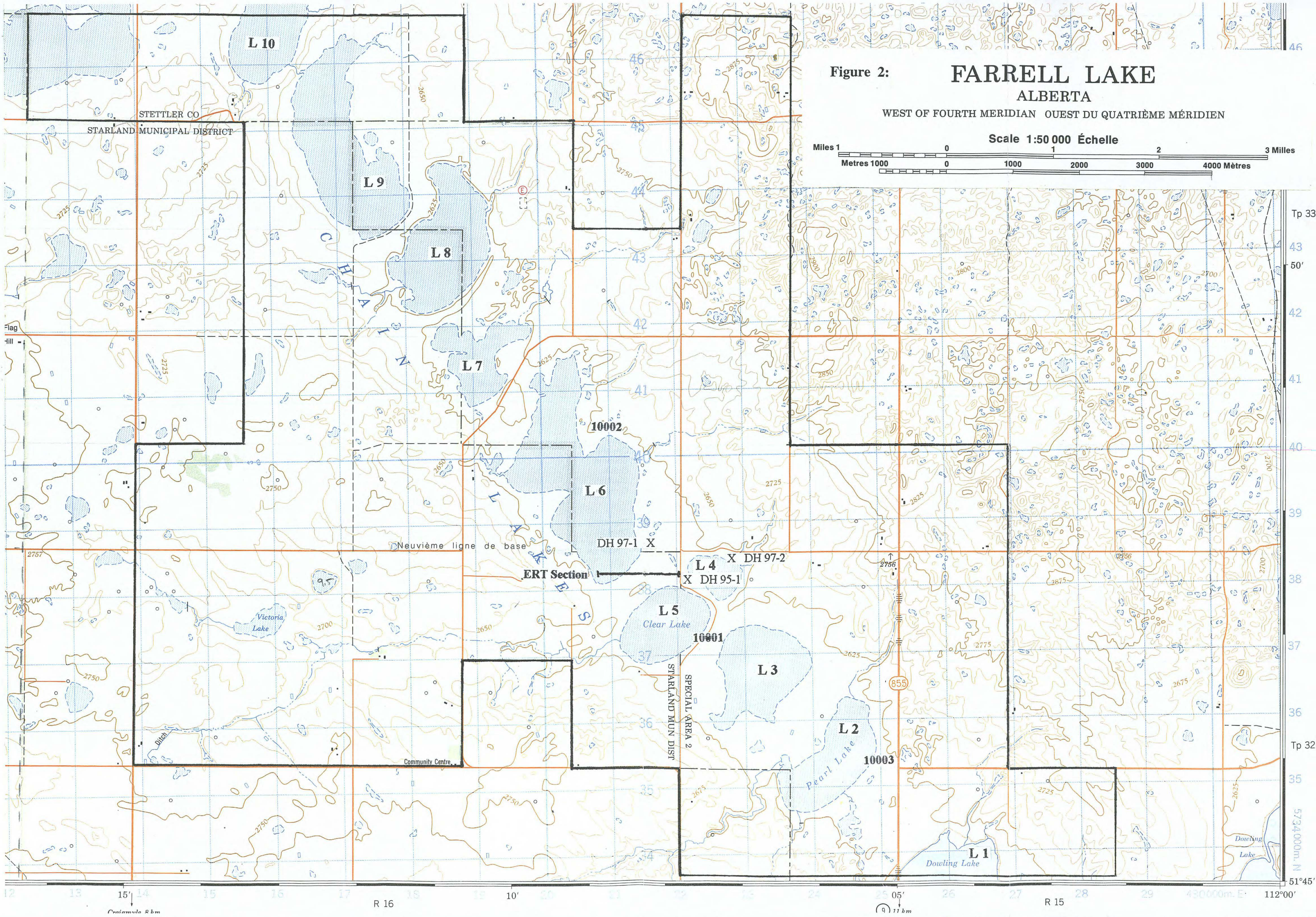
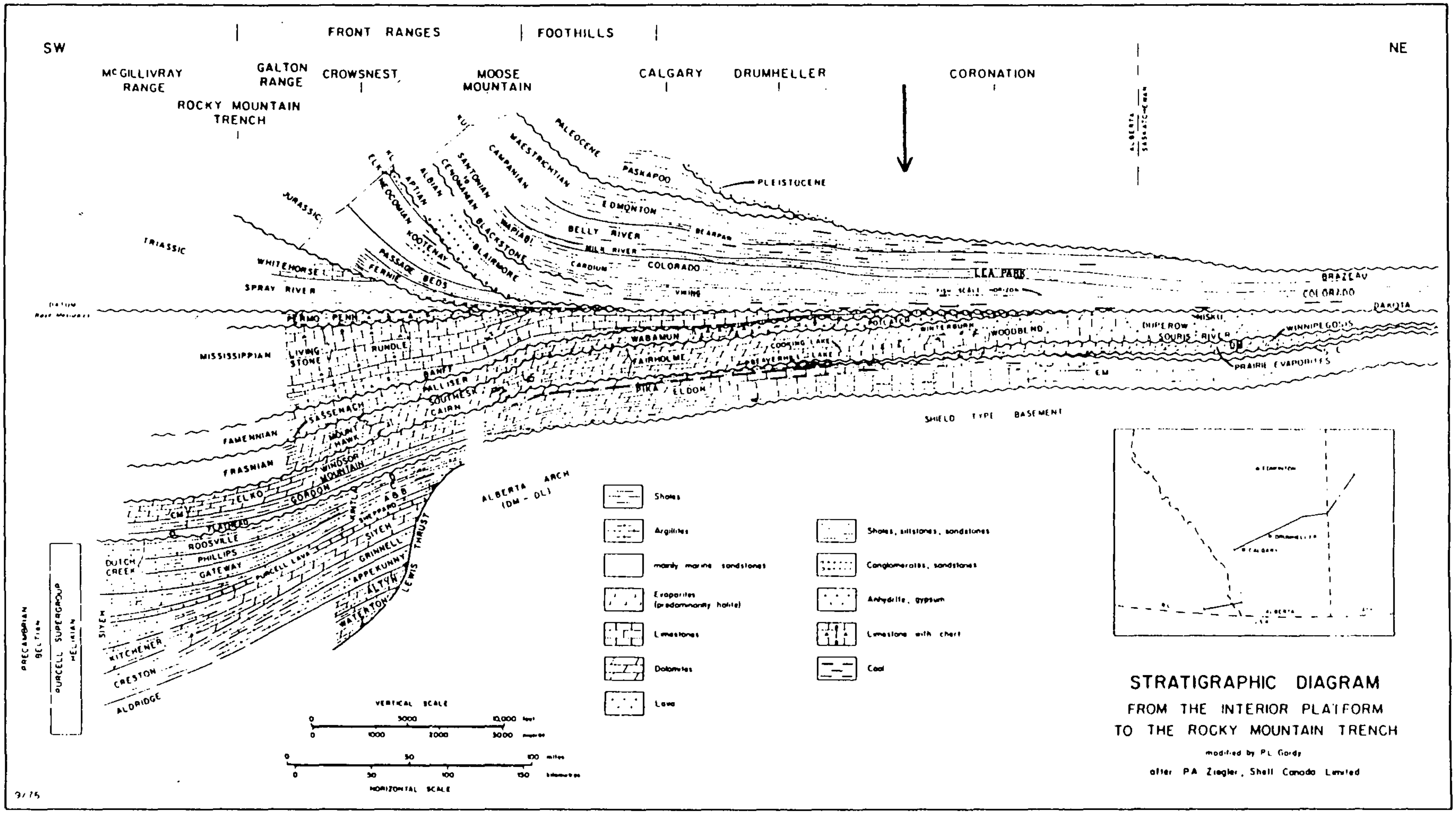


Figure 2: FARRELL LAKE
ALBERTA
WEST OF FOURTH MERIDIAN OUEST DU QUATRIÈME MÉRIDIEN



STRATIGRAPHIC DIAGRAM
FROM THE INTERIOR PLATFORM
TO THE ROCKY MOUNTAIN TRENCH

modified by P.L. Gordy
after P.A. Ziegler, Shell Canada Limited

Figure 3. Schematic west to east cross-section across the Western Canada sedimentary basin.

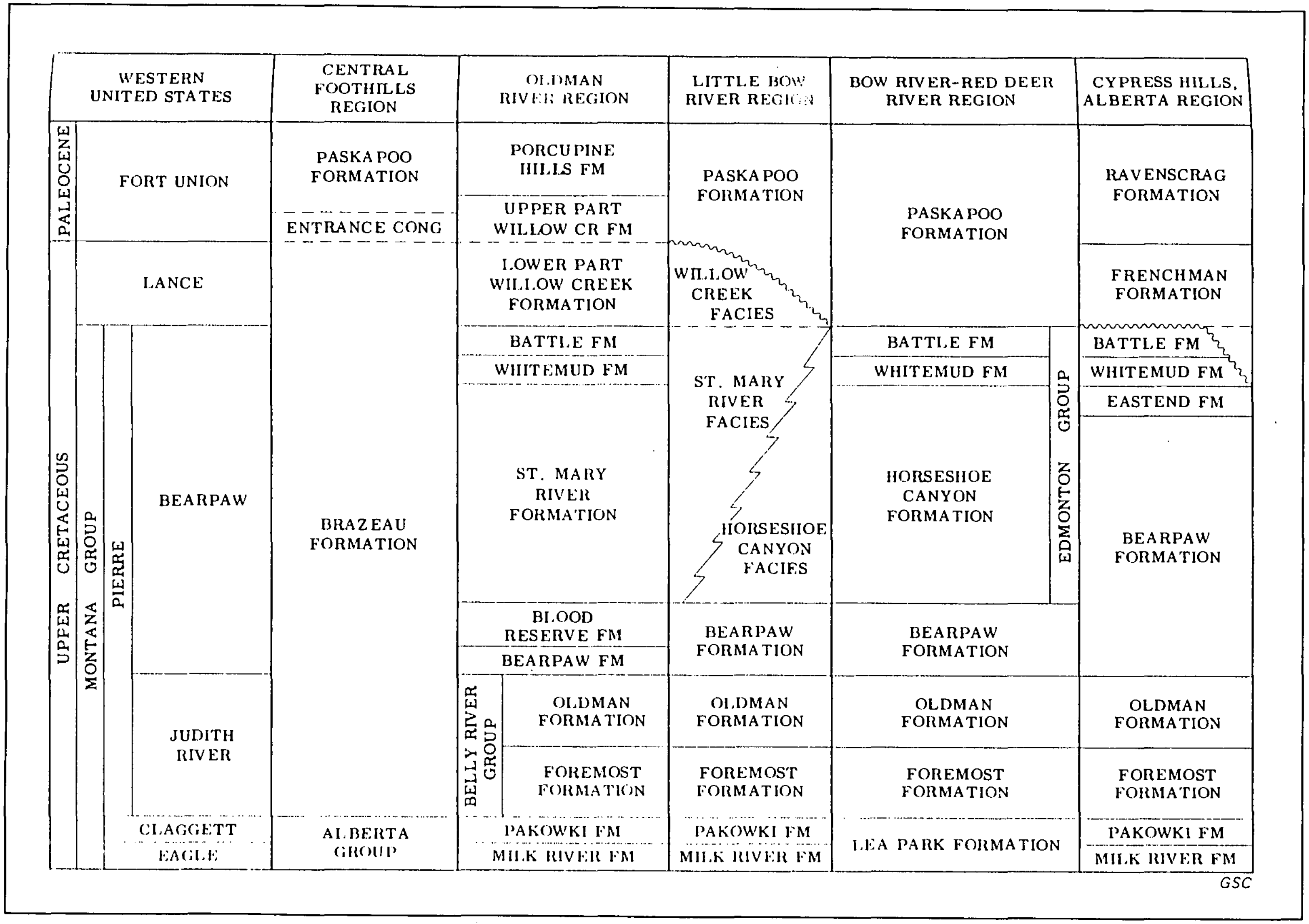
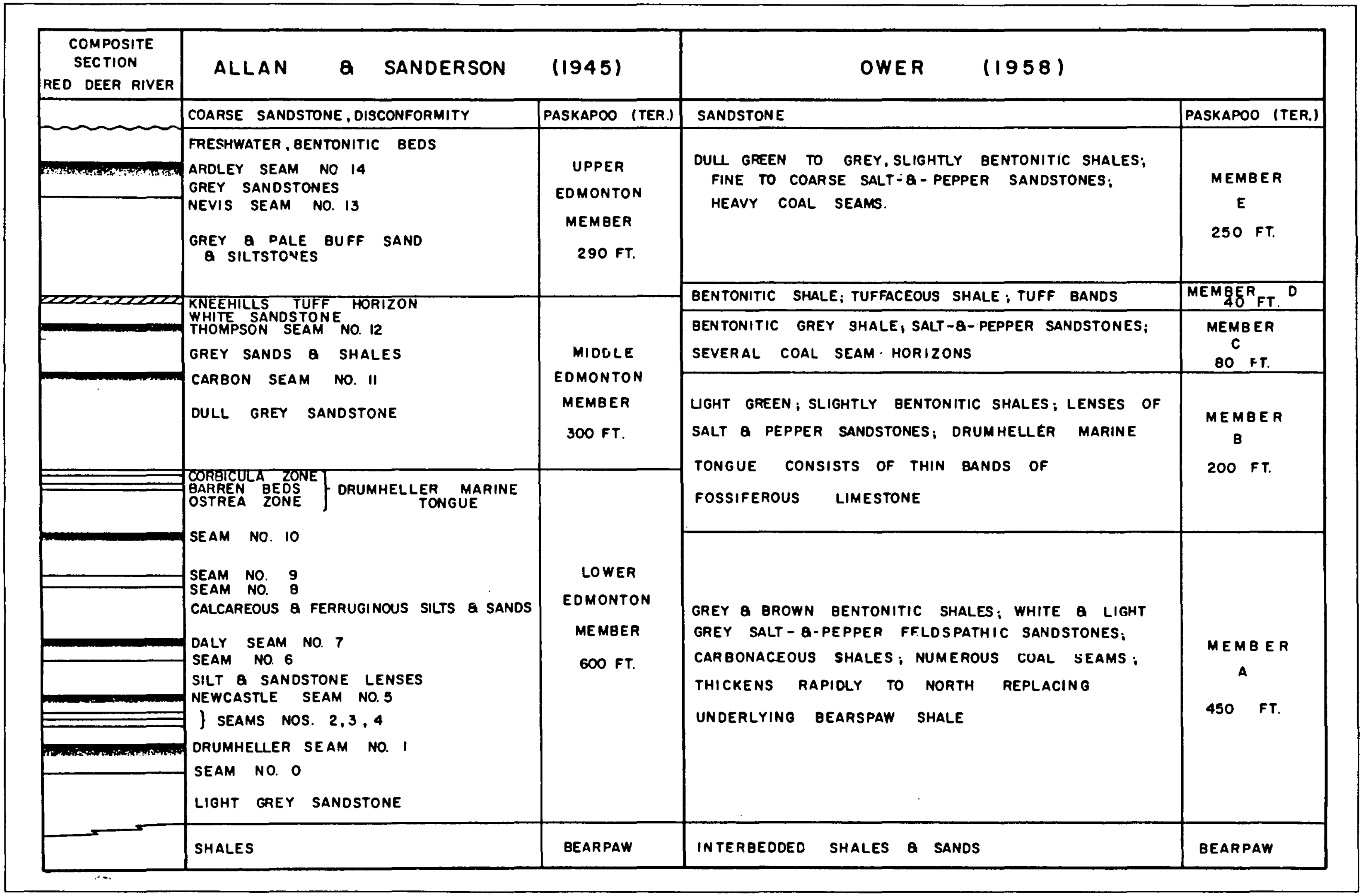
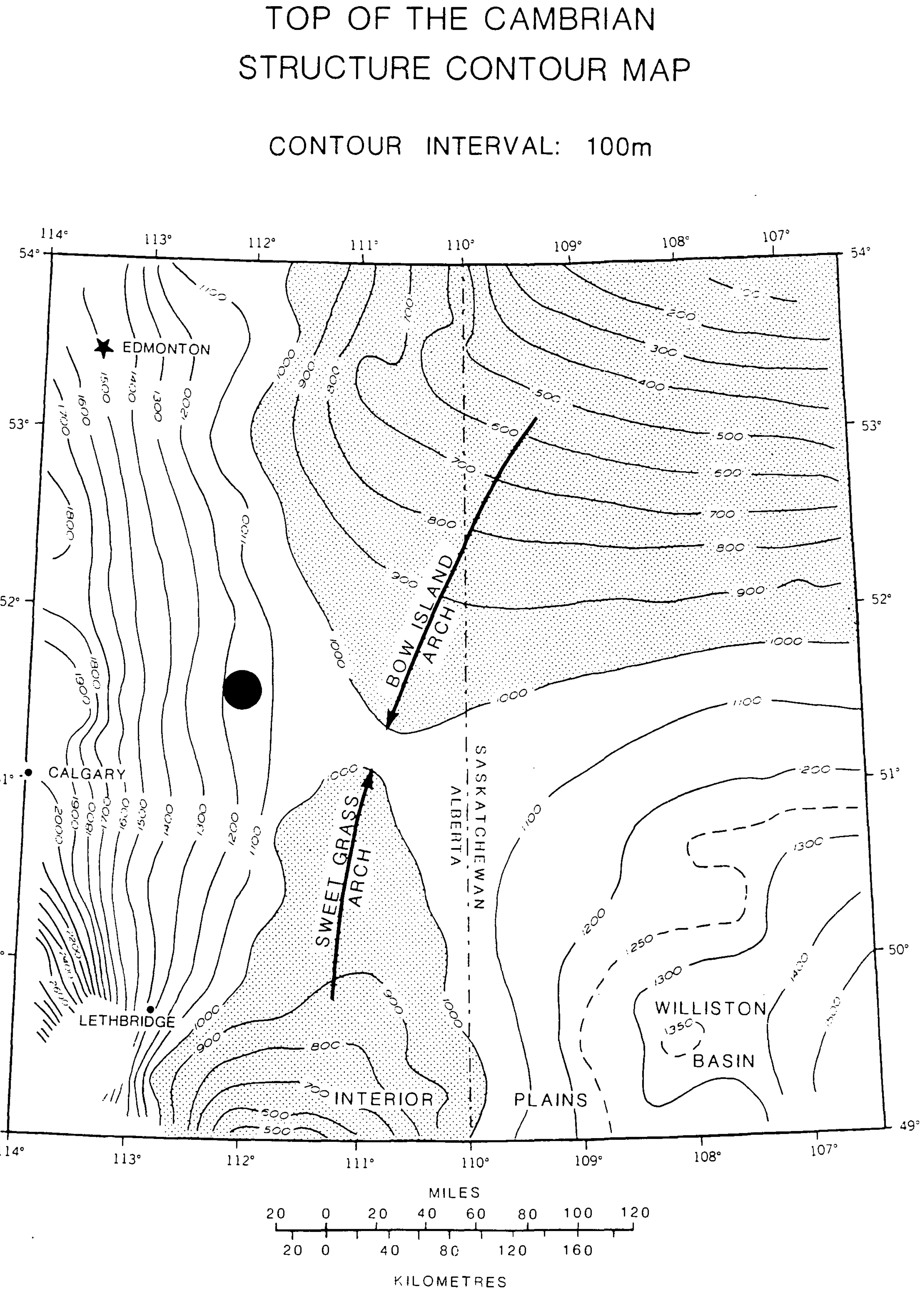


Figure 4: Correlation of the uppermost Cretaceous and Paleocene formations of the southern Alberta Plans and central Foothills: from Irish 1970.



COMPOSITE SECTION RED DEER RIVER	ALLAN & SANDERSON (1945)		OWER (1958)	
	COARSE SANDSTONE, DISCONFORMITY	PASKAPOO (TER.)	SANDSTONE	PASKAPOO (TER.)
	FRESHWATER, BENTONITIC BEDS ARDLEY SEAM NO 14 GREY SANDSTONES NEVIS SEAM NO. 13 GREY & PALE BUFF SAND & SILTSTONES	UPPER EDMONTON MEMBER 290 FT.	DULL GREEN TO GREY, SLIGHTLY BENTONITIC SHALES; FINE TO COARSE SALT-&-PEPPER SANDSTONES; HEAVY COAL SEAMS.	MEMBER E 250 FT.
	KNEEHILLS TUFF HORIZON	MIDDLE EDMONTON MEMBER 300 FT.	BENTONITIC SHALE; TUFFACEOUS SHALE; TUFF BANDS	MEMBER D 40 FT.
	WHITE SANDSTONE THOMPSON SEAM NO. 12 GREY SANDS & SHALES		BENTONITIC GREY SHALE, SALT-&-PEPPER SANDSTONES; SEVERAL COAL SEAM HORIZONS	MEMBER C 80 FT.
	CARBON SEAM NO. 11 DULL GREY SANDSTONE		LIGHT GREEN; SLIGHTLY BENTONITIC SHALES; LENSES OF SALT & PEPPER SANDSTONES; DRUMHELLER MARINE TONGUE CONSISTS OF THIN BANDS OF FOSSIFEROUS LIMESTONE	MEMBER B 200 FT.
	CORBICULA ZONE BARREN BEDS } DRUMHELLER MARINE TONGUE OSTREA ZONE	LOWER EDMONTON MEMBER 600 FT.		
	SEAM NO. 10 SEAM NO. 9 SEAM NO. 8 CALCAREOUS & FERRUGINOUS SILTS & SANDS DALY SEAM NO. 7 SEAM NO. 6 SILT & SANDSTONE LENSES NEWCASTLE SEAM NO. 5 } SEAMS NOS. 2, 3, 4 DRUMHELLER SEAM NO. 1 SEAM NO. 0 LIGHT GREY SANDSTONE		GREY & BROWN BENTONITIC SHALES; WHITE & LIGHT GREY SALT-&-PEPPER FELDSPATHIC SANDSTONES; CARBONACEOUS SHALES; NUMEROUS COAL SEAMS; THICKENS RAPIDLY TO NORTH REPLACING UNDERLYING BEARSPAW SHALE	MEMBER A 450 FT.
	SHALES	BEARPAW	INTERBEDDED SHALES & SANDS	BEARPAW

Figure 5: Subdivision of Edmonton formation according to Allen and Sanderson (1945) and Ower (1958).


TOP OF THE CAMBRIAN
STRUCTURE CONTOUR MAP

CONTOUR INTERVAL: 100m

Figure 6. Computer generated structure map on top of the Cambrian.

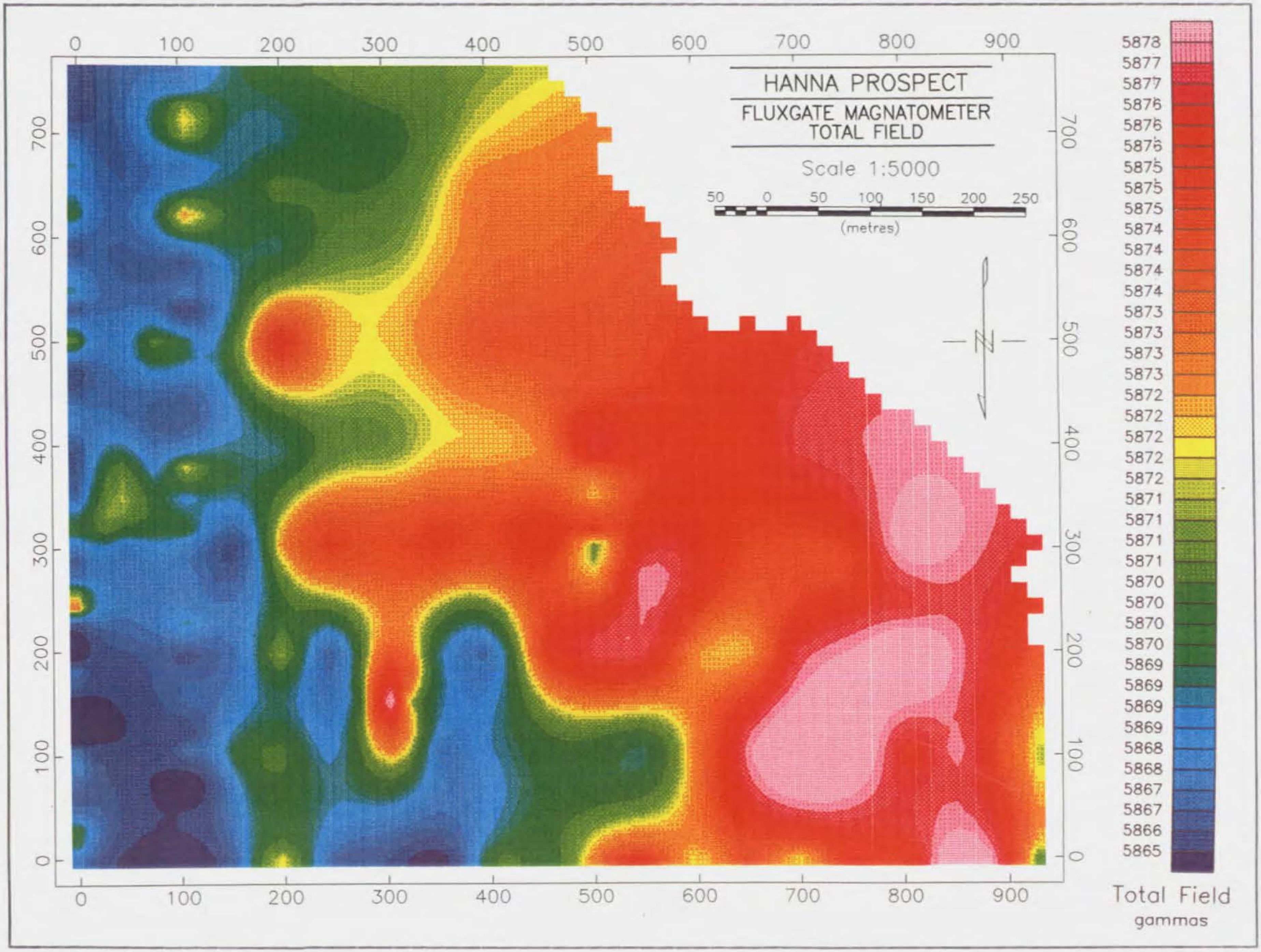
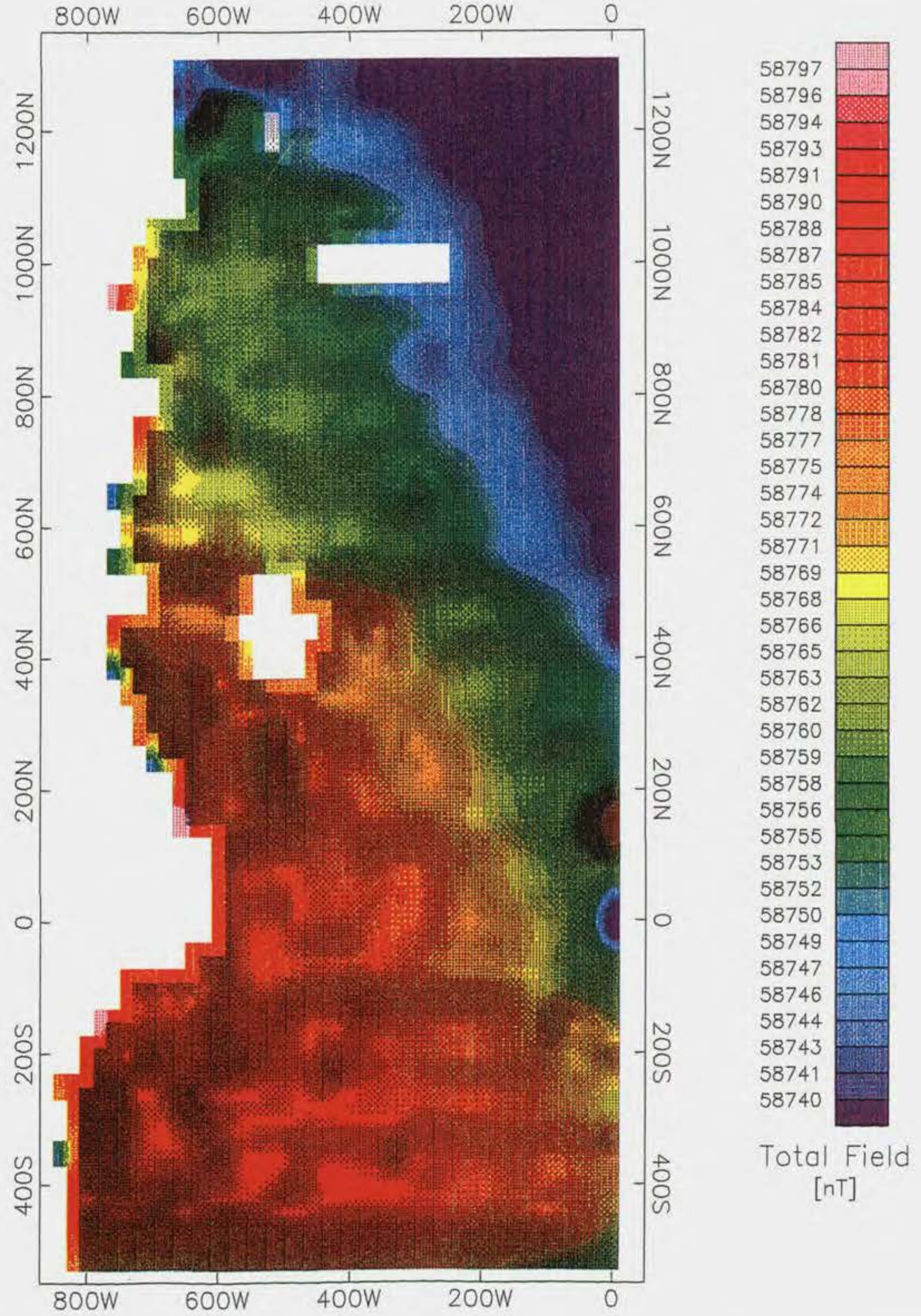


Figure 7: Magnetic Contour Map of Lake 4.



Scale 1:10000
100 0 100 200
(metres)

Figure 8: TOTAL FIELD MAGNETOMETER SURVEY
[nT]

DATA COLLECTED: JULY 4th, 1997

KOMEX INTERNATIONAL LTD. FILE: KI97-4561

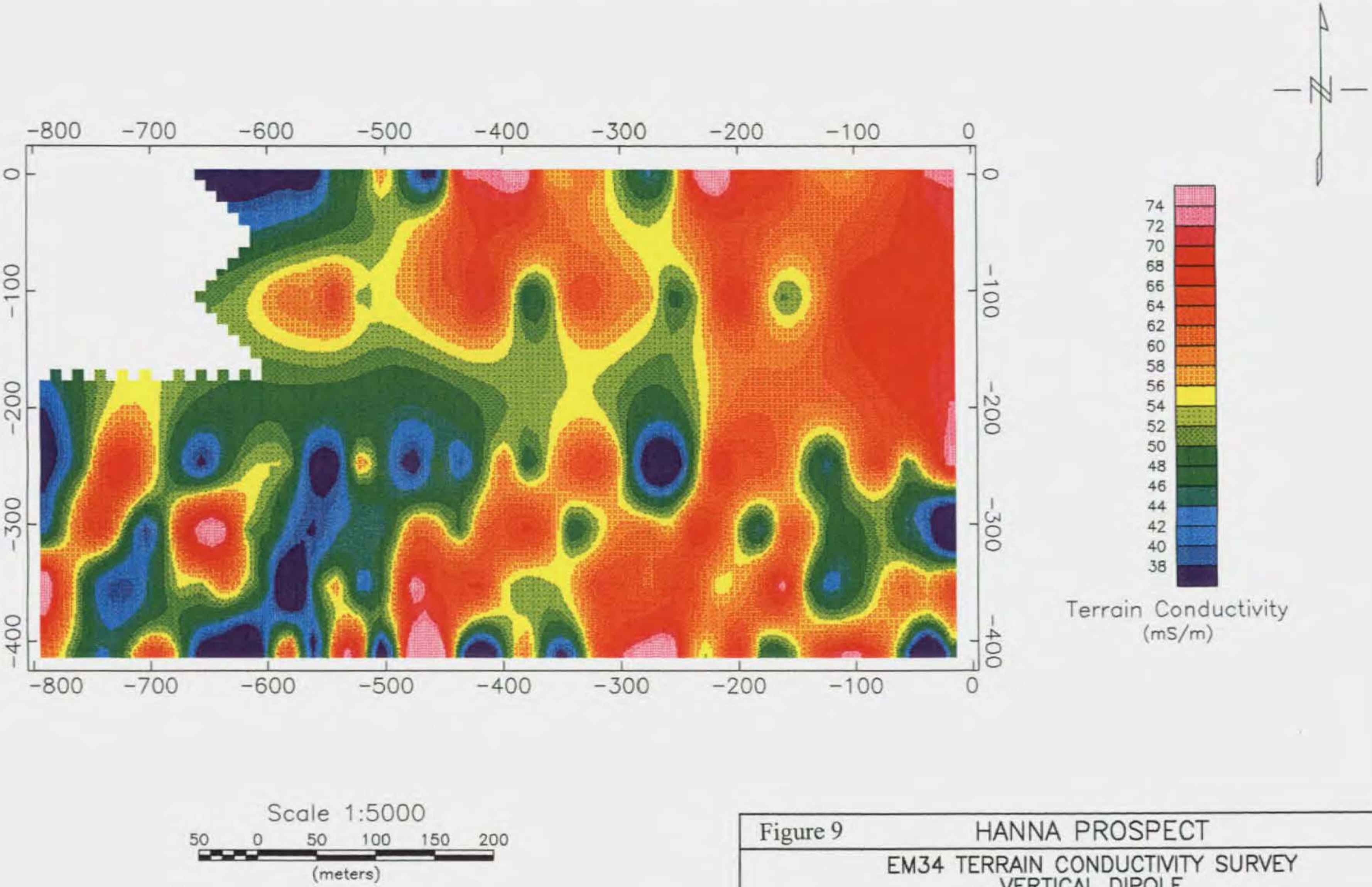
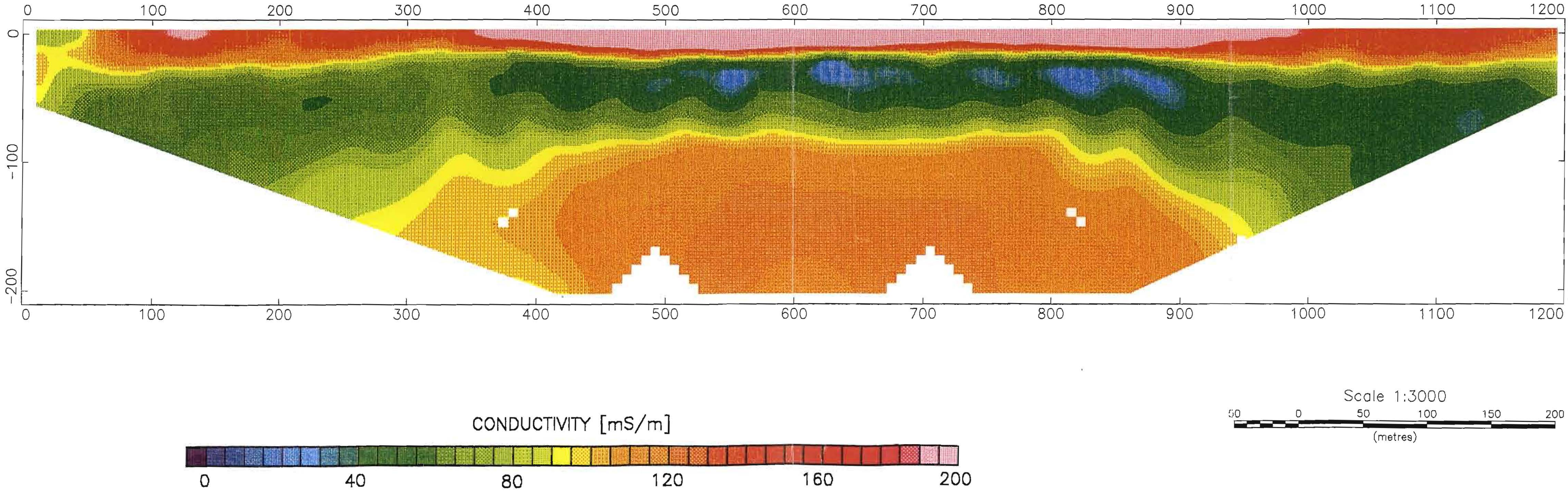


Figure 9

HANNA PROSPECT

EM34 TERRAIN CONDUCTIVITY SURVEY
VERTICAL DIPOLE
40 M COIL SPACING

KOMEX INTERNATIONAL LIMITED FILE: 4561S



ELECTRICAL RESISTIVITY TOMOGRAPHY LINE 1
END POINTS: (0W,250S) - (1200W,250S)

ELECTRODE SPACING: 15 m
TOTAL LINE LENGTH: 1200 m
DATA COLLECTED: JULY 31, 1997.
FIGURE (**10**)

Customer: DIA MET MINERALS LTD.

ELECTRON MICROPROBE ANALYSIS FROM C.F. MINERAL RESEARCH LTD.
Batch File "95-613"

8-May-1996

Sample #	Mount	Cell	Grain	Classifications SA	OI	CFM	SiO2	TiO2	Al2O3	V2O3	Cr2O3	Fe2O3	FeO	MgO	CaO	MnO	NiO	ZnO	Nb2O5	Na2O	Max Trace Na2O	K2O	Totals	
RH1	1705	1	7			IL		50.43	.00		.01	3.34	44.76	.00	.00	.58		.08	.04				99.25	
RH1	1705	1	8			IL		50.43	.00		.00	3.50	44.80	.02	.02	.52		.00	.05				99.33	
RH1	1705	1	10			OPX	49.04	.03	.25		.03		43.58	3.33	.59	.22	.04			.029		.01	97.14	#
RH1	1705	1	4			QRTZ	101.04	.01	.00		.02		.02	.00	.01	.00	.00			.015		.02	101.14	#
	1705	1	1	CE		CPX	43.15	.29	8.17		.00		33.09	2.16	9.15	.12	.02			.553		.25	96.95	#
	705	1	5	CE		CPX	45.01	.29	6.38		.01		30.35	2.65	11.24	.08	.00			.471		.20	95.69	#
RH1	1705	1	11	CE		CPX	44.48	.25	7.26		.02		31.49	2.41	10.35	.08	.01			.575		.38	97.31	#
RH1	1705	1	2	R		ALM	36.84	.10	19.97		.03		34.38	.92	7.40	.44	.02			.012		.00	100.11	
RH1	1705	1	3	R		ALM	37.06	.09	20.09		.03		34.00	.86	7.58	.46	.04			.008		.01	100.23	
RH1	1705	1	6	R		ALM	36.91	.11	19.95		.00		34.53	.97	7.05	.37	.01			.027		.01	99.54	
RH1	1705	1	9	R		ALM	36.69	.10	19.95		.02		34.16	.80	7.60	.43	.00			.011		.01		
RH2	1706	1	7			IL		50.60	.01		.02	3.23	44.74	.10	.01	.58		.00	.00					
RH2	1706	1	1			QRTZ	100.87	.01	.04		.02		.29	.00	.06	.00	.04			.001				
[illegible]	1706	1	3			QRTZ	100.44	.00	.01		.00		.05	.00	.00	.00	.02			.005				
[illegible]	1706	1	2	CE		CPX	47.44	.17	6.98		.04		22.20	7.58	11.65	.10	.00			.495		[illegible]		
[illegible]	1706	1	10	CE		CPX	51.73	.13	2.23		.00		22.05	9.12	11.90	.17	.02			.126		[illegible]		#
[illegible]	1706	1	12	CE		CPX	44.62	.40	10.53		.02		22.31	6.17	11.63	.13	.03			.669		13	[illegible]	#
RH2	1706	1	5	R		ALM	37.65	.14	20.86		.00		30.23	3.11	7.56	.72	.00			.004		[illegible]	100.27	
RH2	1706	1	6	R		ALM	37.40	.15	20.72		.02		30.06	3.08	7.43	.63	.03			.029		[illegible]	99.54	
RH2	1706	1	8	R		ALM	37.62	.08	20.93		.00		30.27	2.74	7.55	.75	.04			.006		.01	99.99	
RH2	1706	1	9	R		ALM	37.75	.11	20.86		.00		29.87	3.04	7.53	.65	.03			.053		01	99.89	
RH2	1706	1	11	R		ALM	37.59	.08	20.79		.01		30.19	2.98	7.74	.68	.06			.008		.00	100.11	

Figure 11: Microprobe Analyses from C.F. Mineral Research Ltd. on samples #001 (RH1) and #002 (RH2).

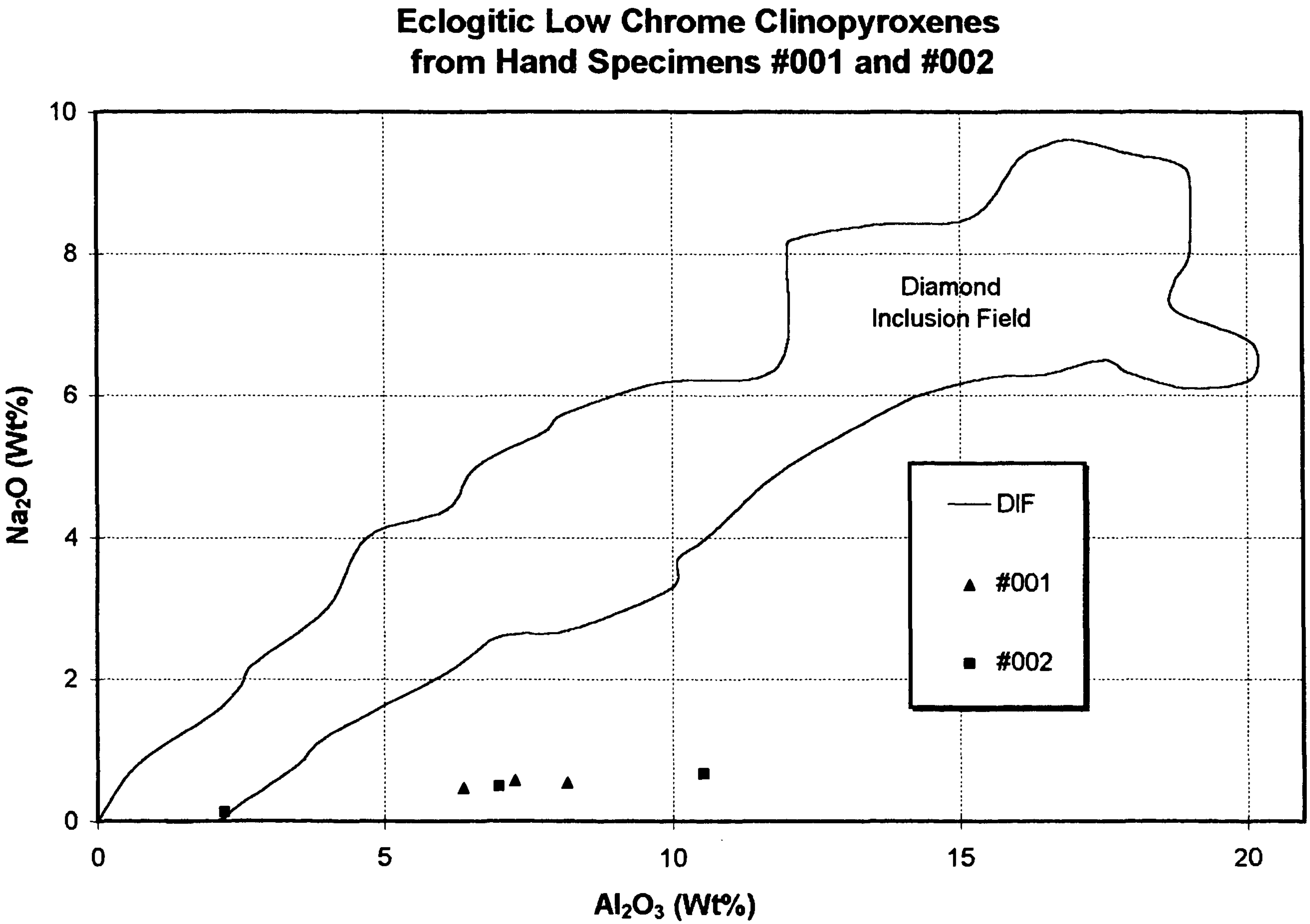


Figure 12: Al2O3 vs Na2O for Eclogitic Low Chrome Diopsides from hand samples #001 and #002

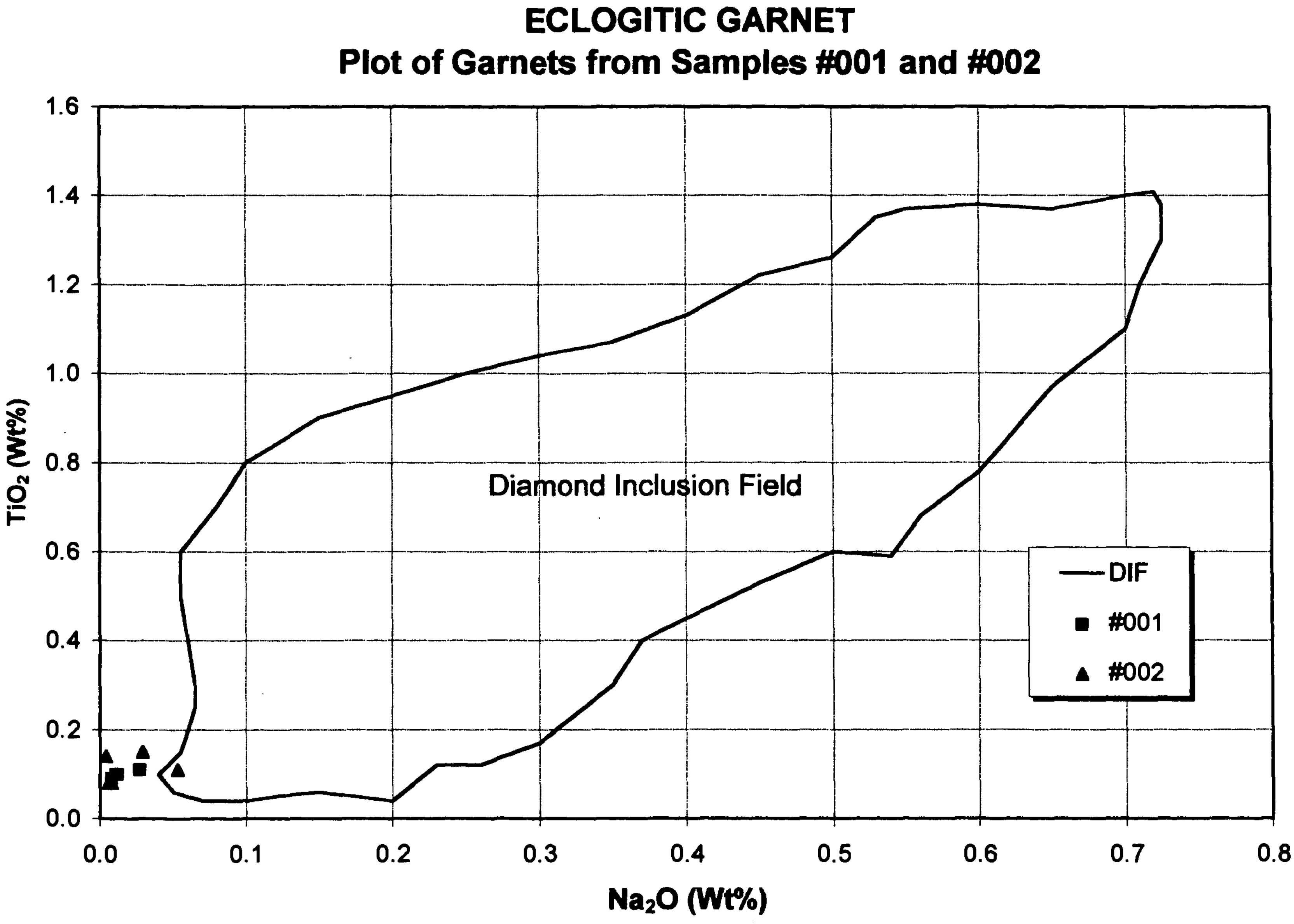


Figure 13: Na2O vs TiO2 for Eclogitic Garnets from samples #001 and #002

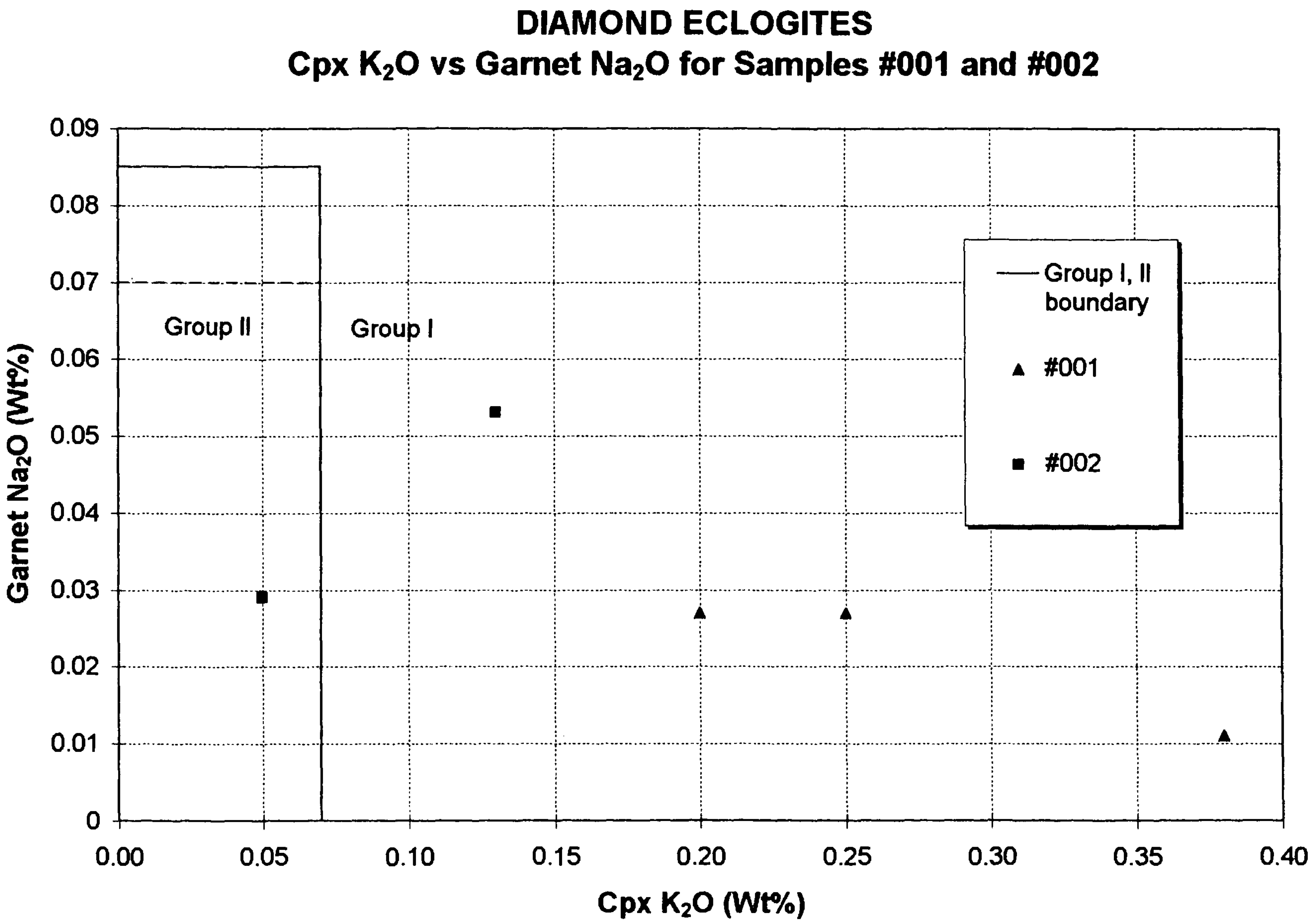


Figure 14: Cpx K20 vs Gar Na2O for samples #001 and #002

A Comparison of Rare Earth Element Values

	DH 95-1 ppm	MIR ppm	average Kimberlite ppm
La	20.0	21.5	150.0
Ce	37.0	43.5	200.0
Nd	17.0	10.7	85.0
Sm	3.2	2.2	13.0
Eu	0.4	0.8	3.0
Tb	0.6	----	1.0
Yb	1.4	0.1	1.2
Lu	0.2	0.03	0.16
Hf	3.6	na	5.6
Cs	1.8	na	2.2
U	2.0	na	3.1
(diamondiferous kimberlites from the centre of the Siberian Platform have lower U (1.2 ppm) and Th (6.7 ppm) than barren marginal kimberlites (U = 2.5 ppm, Th = 17.5 ppm)			
Th	5.1	na	17.0
Rb	32.0	na	73.0

Figure 15: Comparison of REE Values from DH 95-1 with the Mir Pipe and average Kimberlite.

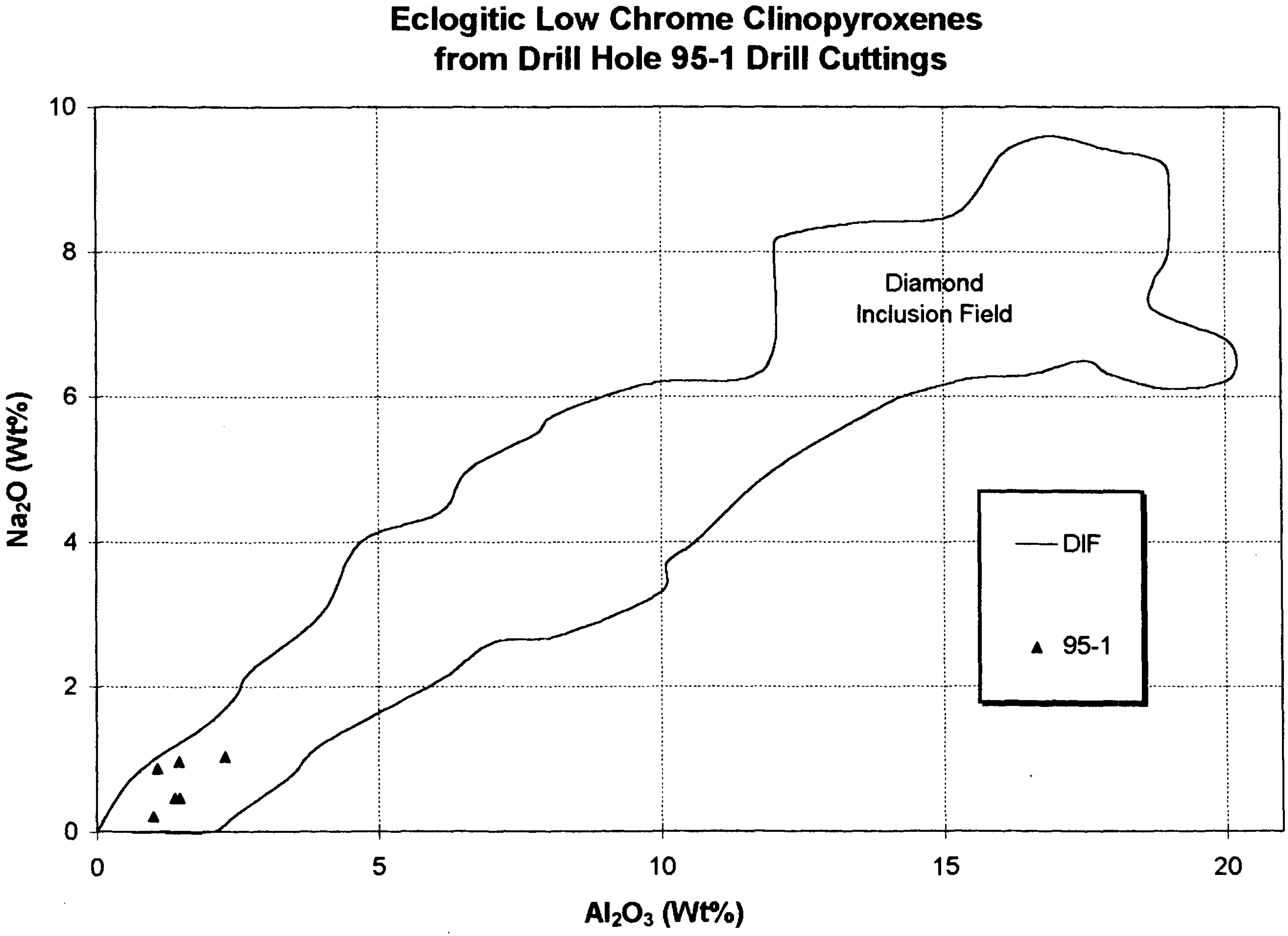


Figure 16: Al2O3 vs Na2O for Eclogitic Low Chrome Diopsides from DH 95-1 cuttings

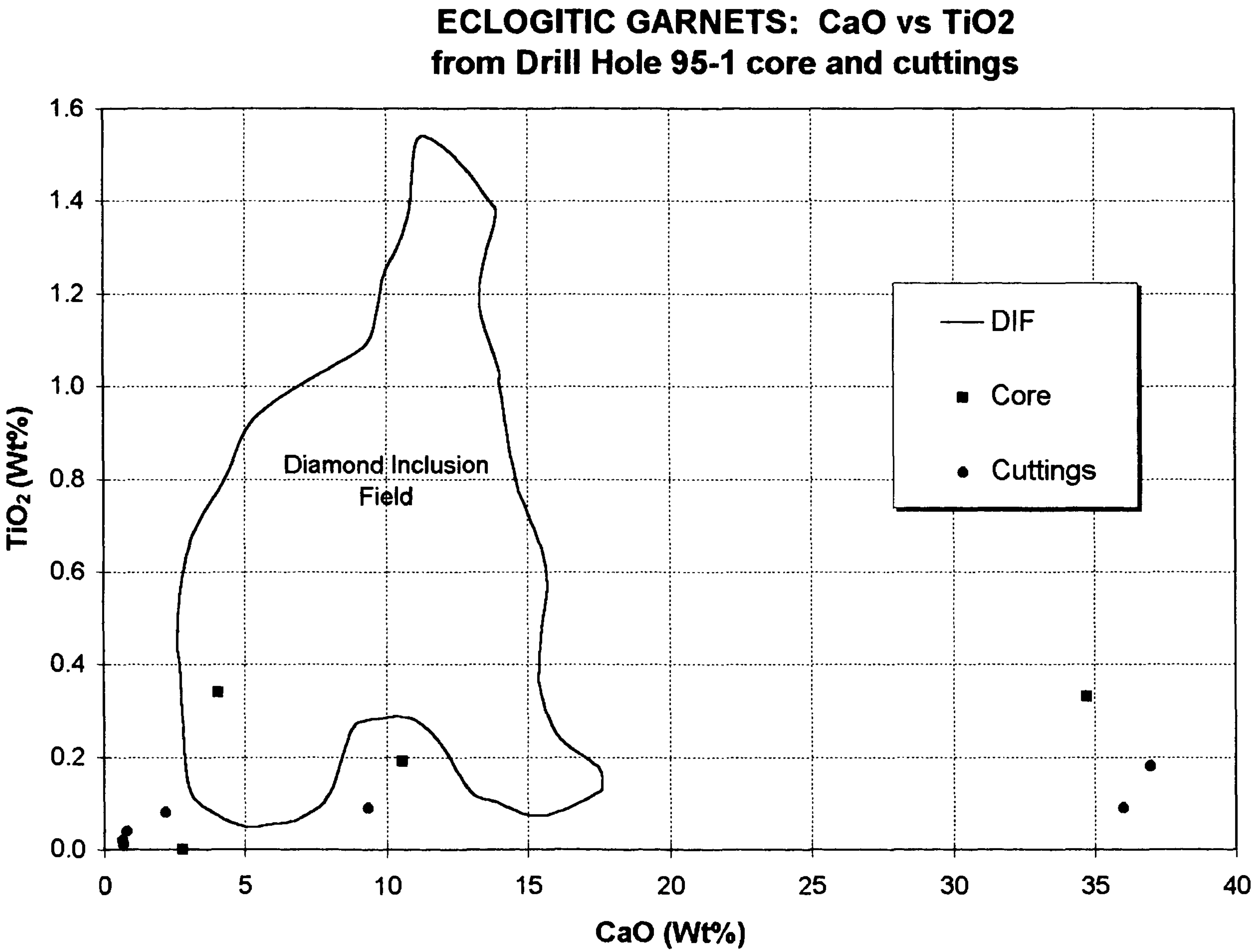
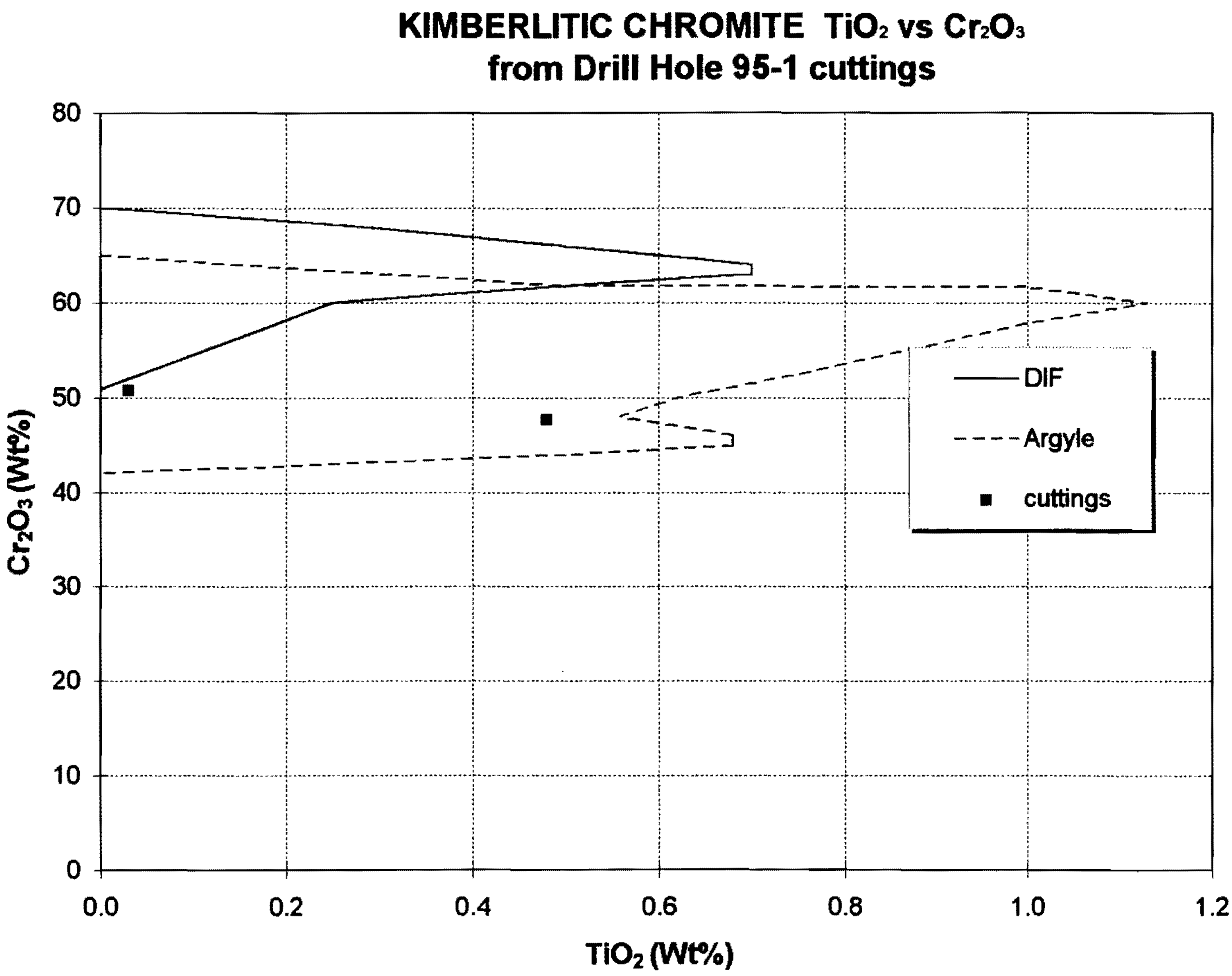


Figure 17: CaO vs TiO2 in Eclogitic Garnets from DH 95-1 core and cuttings



KIMBERLITIC CHROMITE TiO_2 vs Cr_2O_3
from Drill Hole 95-1 cuttings

Figure 18: TiO2 vs Cr2O3 in Chromites from DH 95-1 cuttings

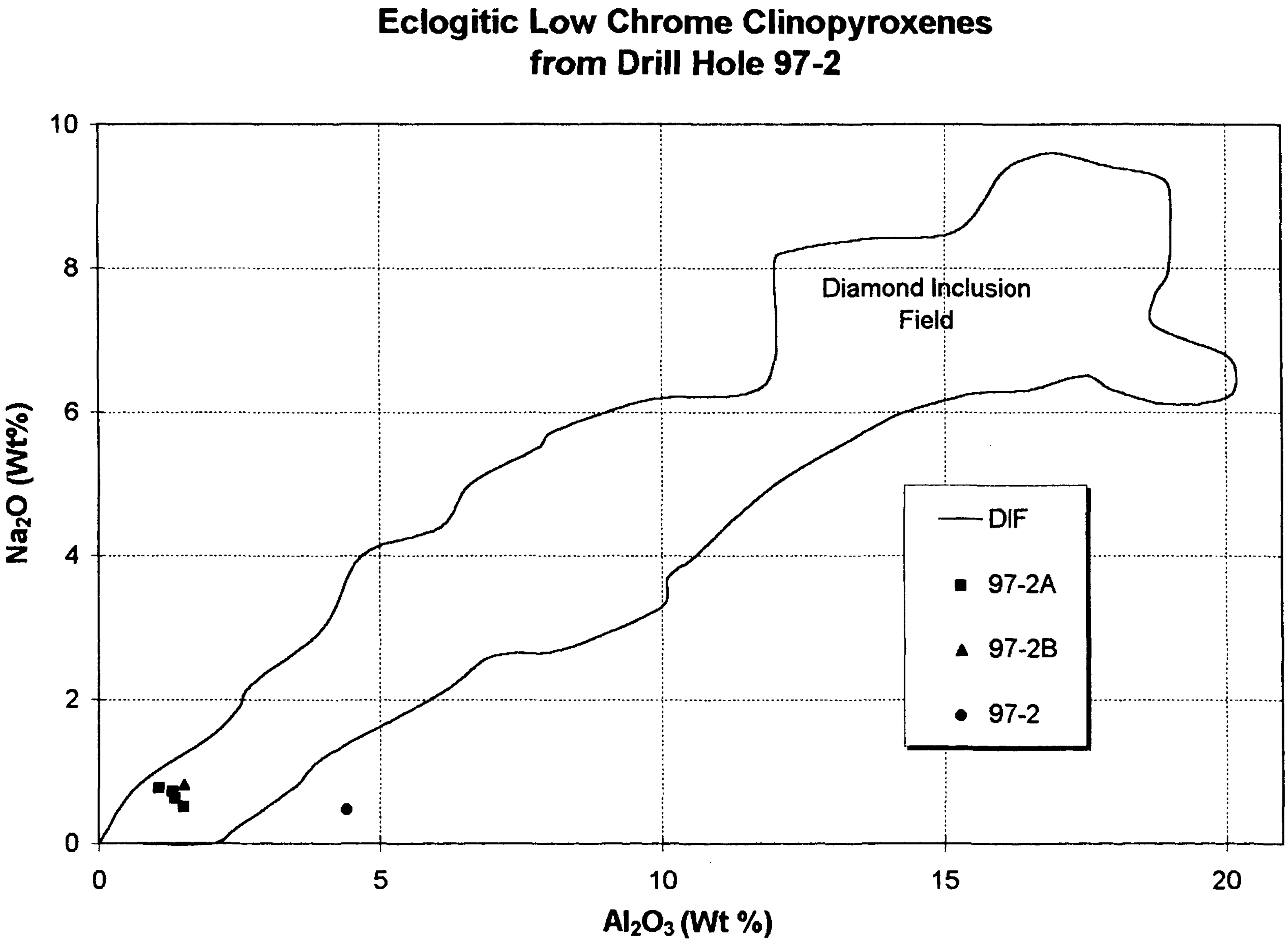


Figure 19: Al2O3 vs Na2O for Eclogitic Low Chrome Diopsides from DH 97-2

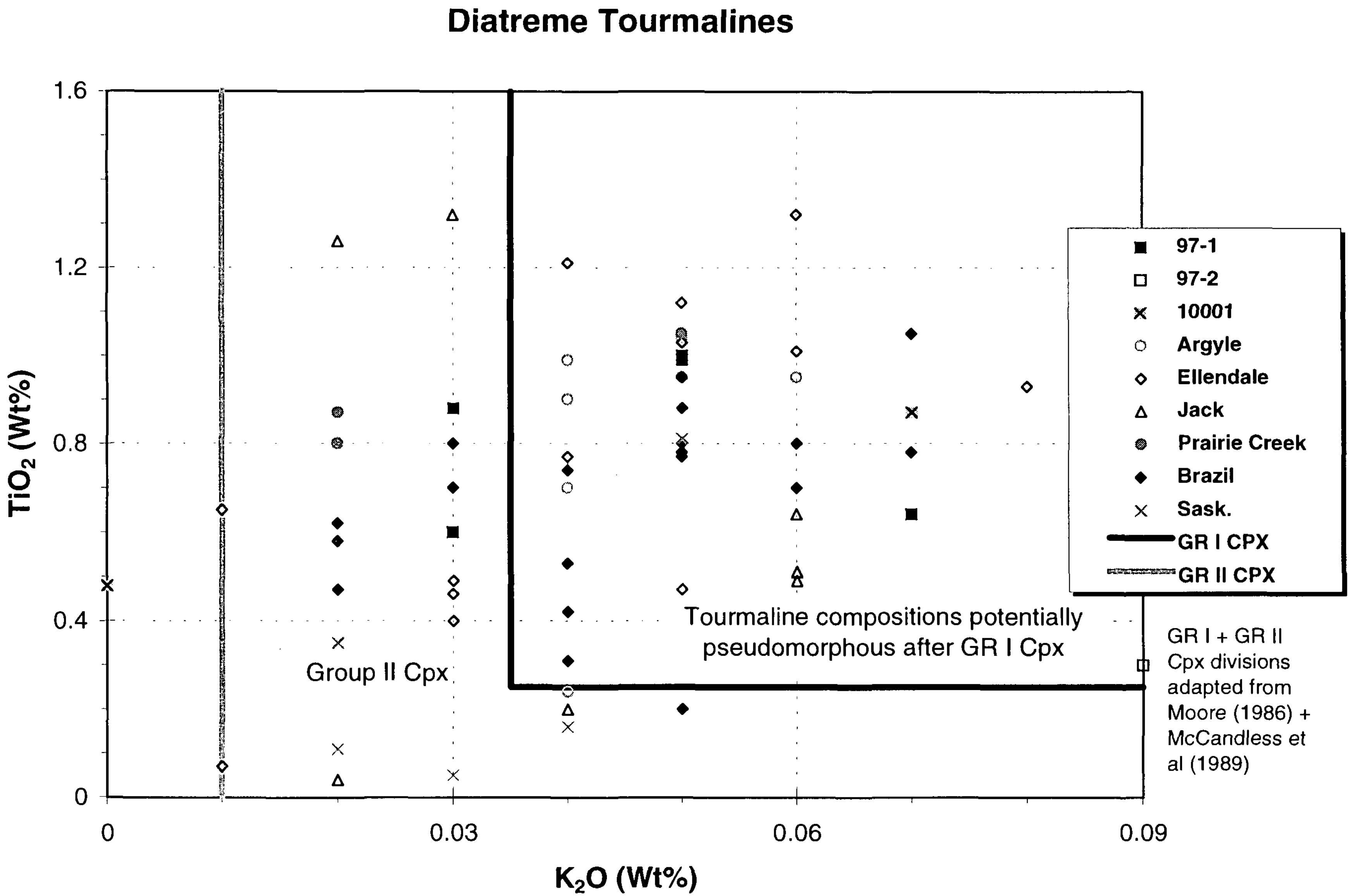


Figure 20: K_2O vs TiO_2 for diatreme tourmalines from DH 97-1, DH 97-2 and sample 10001.

Photo #1: Raymond Haimila examines drill cuttings from hole 97-1 in the field.

Photo 2: DH 95-1, 332': Glauconitic SS with matrix supported 'clasts'. Clast in section of core at left deforms the sediment underneath it suggesting it was dropped into place.

Photo 3: Boulder bed on the north shore of Clear Lake

Photo 4: Bulk test pit #1; immediately north of the boulder bed on Clear Lake.

Photo 5: Garnet Pyroxene Gneiss: hand specimen catalogue #001
Probable composition of metabasalt or metagabbro in the eclogite metamorphic facies.

Photo 6: Garnet Pyroxenite: hand specimen catalogue #002
Probable composition of metabasalt or metagabbro in the eclogite metamorphic facies.

Photo 7: Coarse grained tuff with crustal xenoliths: hand specimen catalogue # 008
Sand sized matrix of crustal minerals supports well rounded (milled) crustal xenoliths. Possible kimberlitic volcanic rock.

Photo 8: Coarse grained crystal tuff: hand specimen catalogue #016
Mafic and granitic lapilli fragments supported in a matrix of crustal minerals including garnet.

Photo 9: Pyroxene crystal tuff: hand specimen catalogue # 012
Coarse diopside crystals, felsic lapilli and mafic lapilli characterise this sample.

Photo 10: Volcanic breccia: hand specimen catalogue #015.
Rolled felsic xenoliths are supported in a fine grained, mafic matrix demonstrating rapid movement of material prior to lithification.

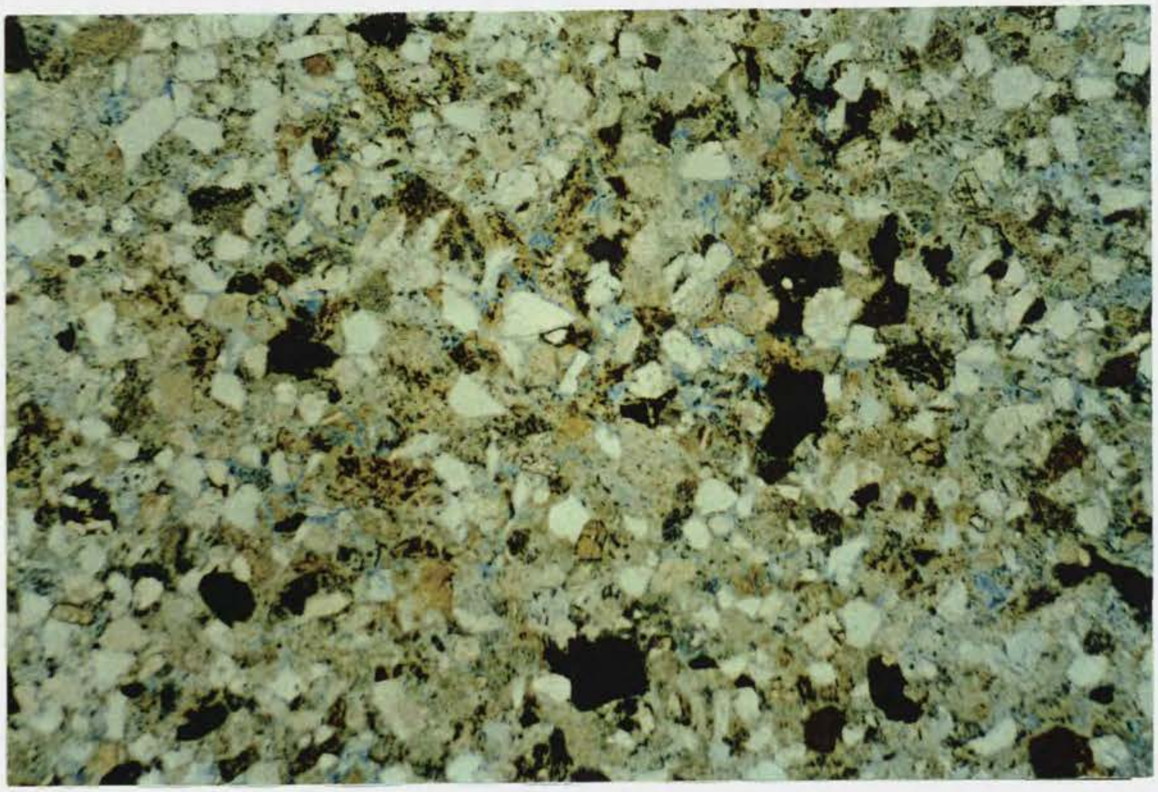


Photo #11: DH 95-1, 372', 32x; cut parallel to bedding; coarse grained, laminated, bentonitic sandstone. Very angular, lithic sandstone with altered mafic and ultramafic rock fragments, angular quartz shards, feldspar and dolomite grains with accessory garnet and olivine.

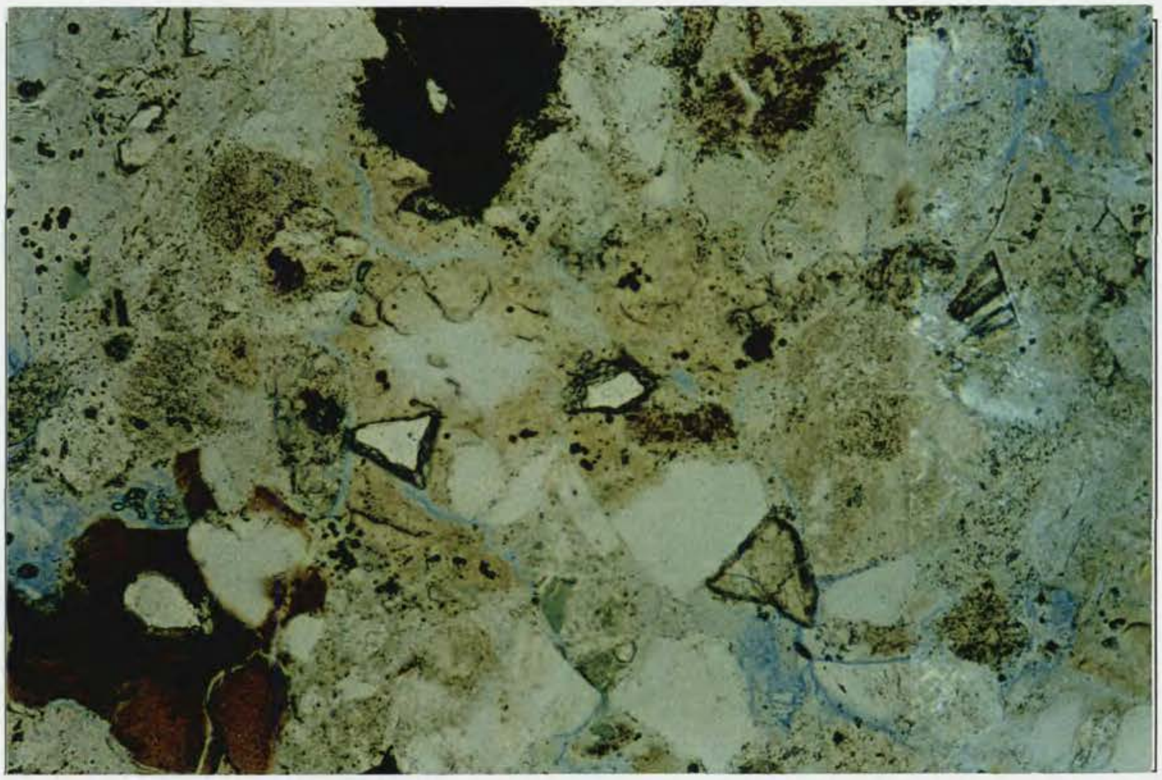


Photo #12: DH 95-1, 372', 120x; high relief, angular grains at center of photo are garnets.

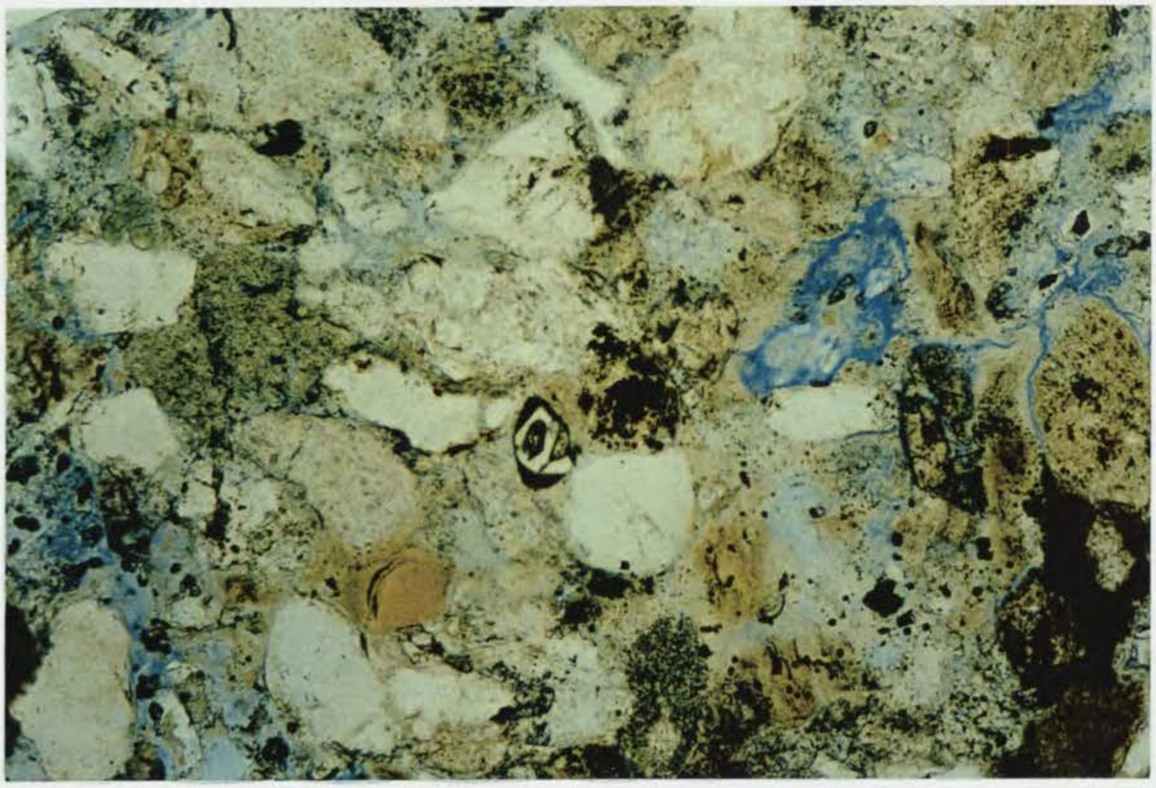


Photo #13: DH 95-1, 372', 120x; an olivine and a detrital dolomite amid altered lithic fragments.

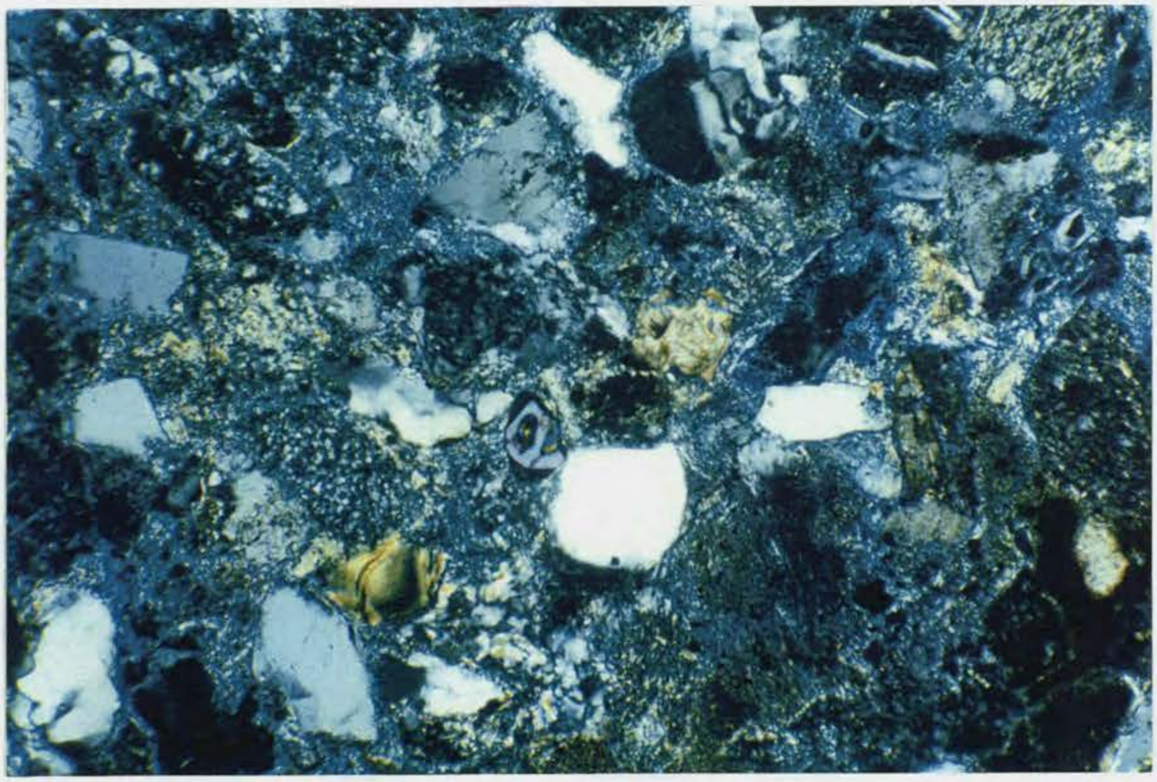


Photo #14: Same photo as above with crossed polars.

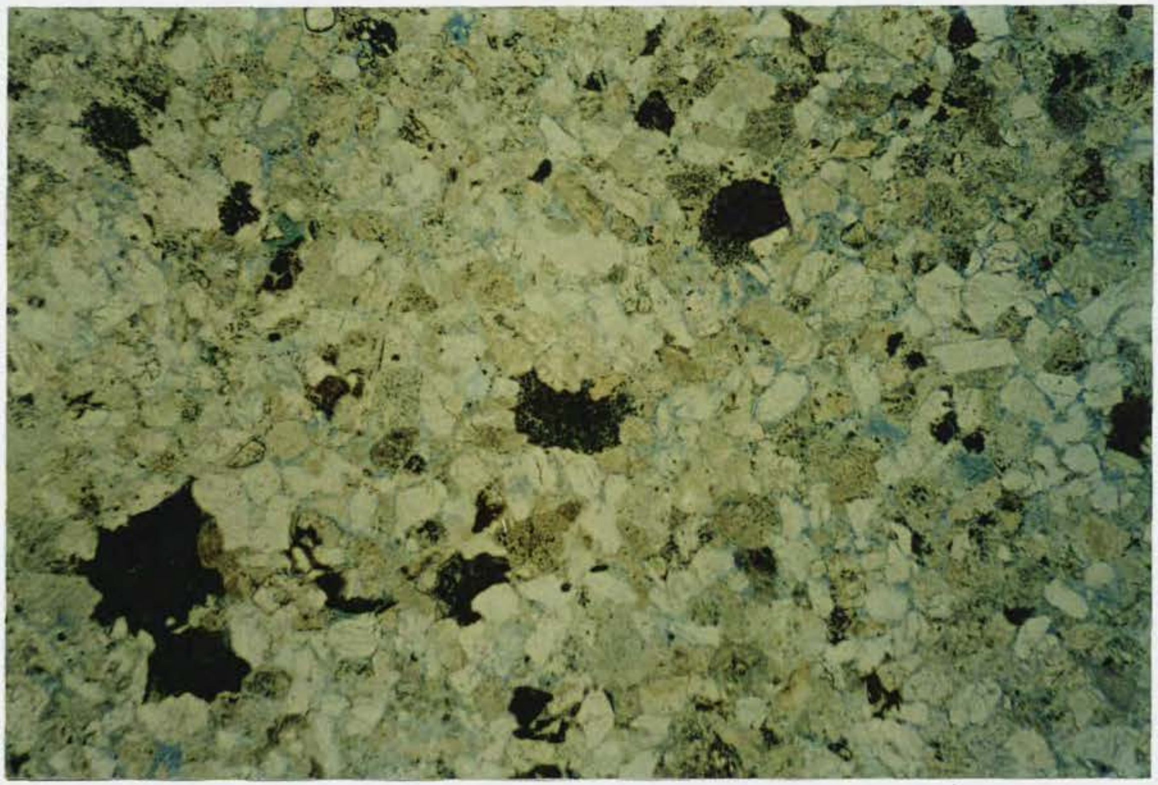


Photo #15: DH 95-1, 320', 32x; med. well sorted, angular, lithic sandstone; siderite clasts are larger than the average rock fragment and siliciclastic grains

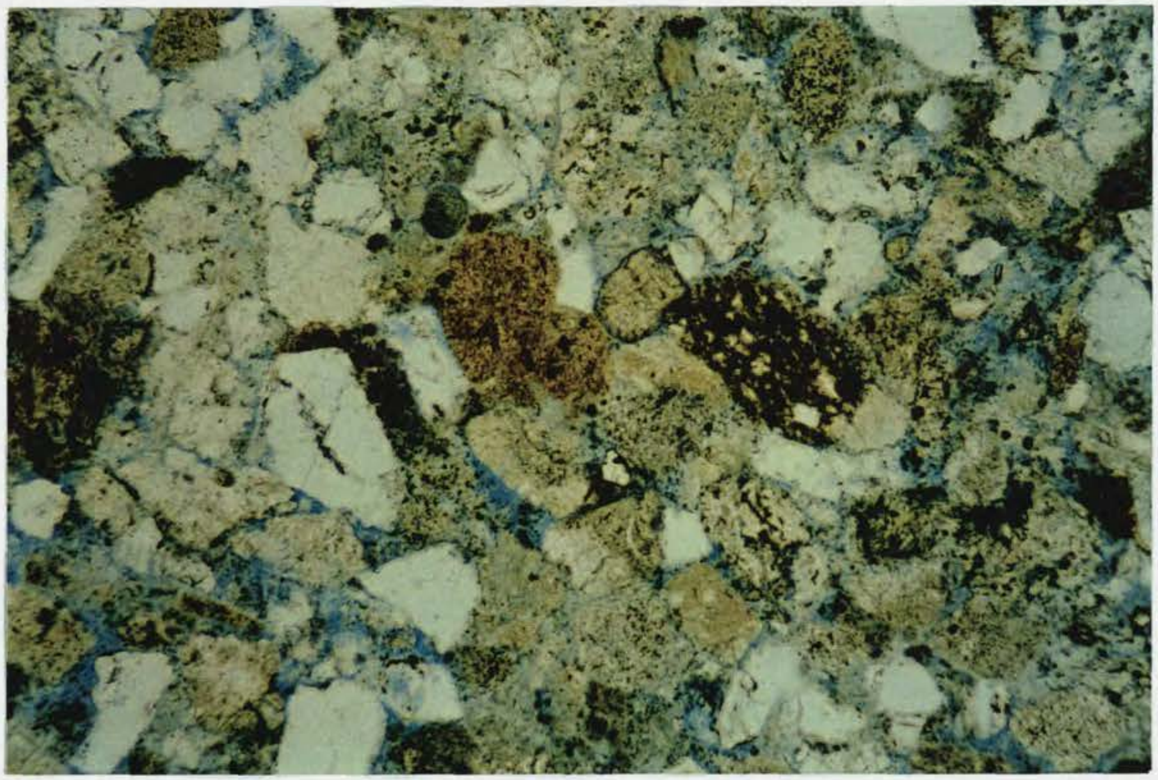


Photo #16: DH 95-1, 320', 80x; olivine?, detrital dolomite, abundant rock fragments.

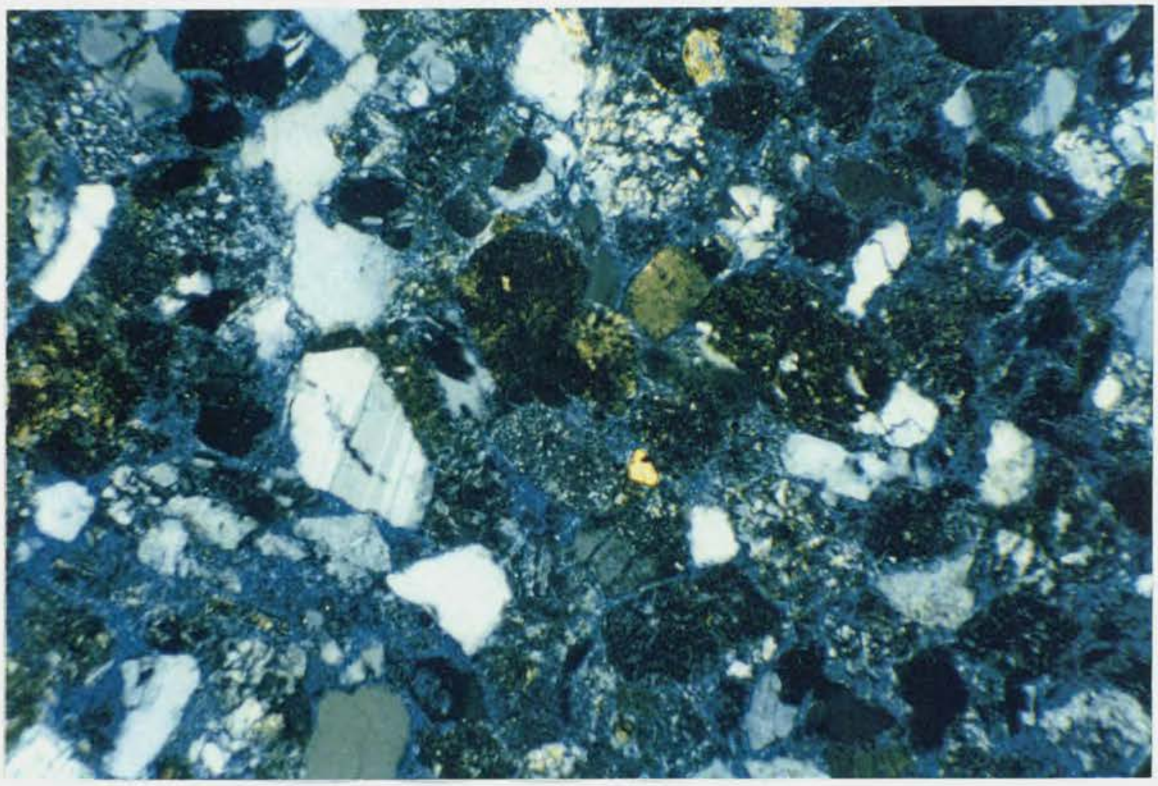


Photo #17: Same as photo 16 with crossed polars

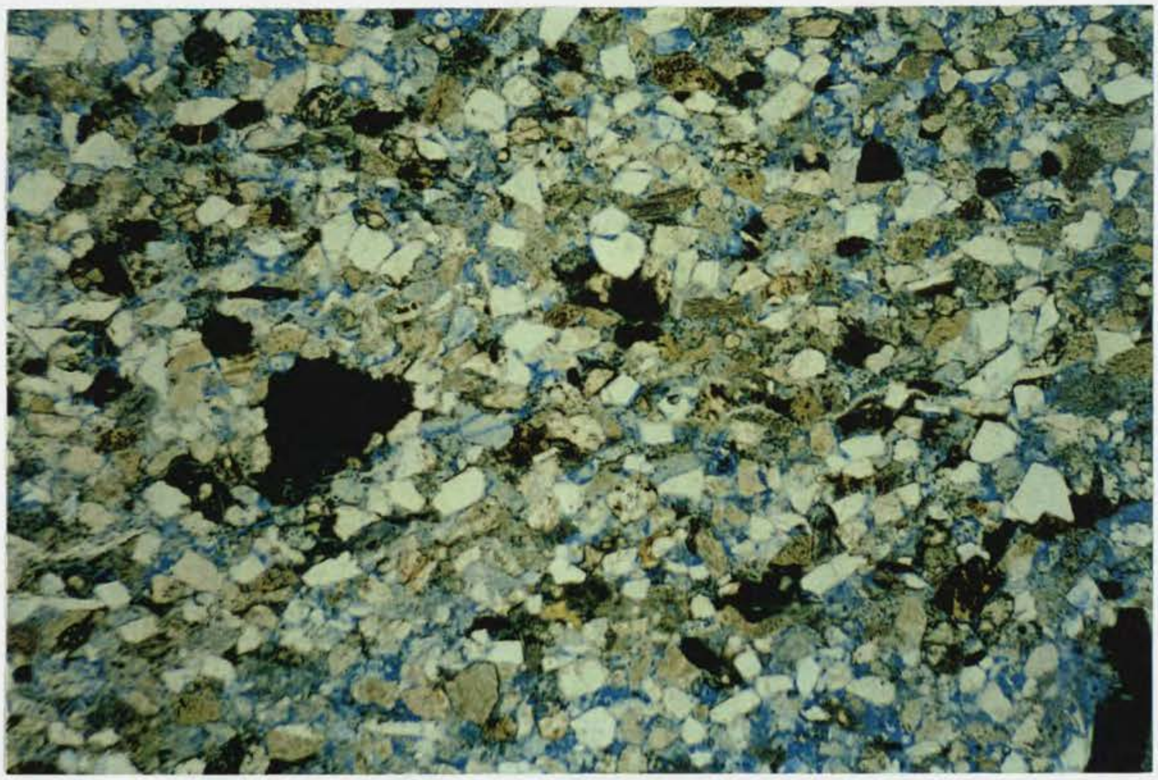


Photo #18: DH 95-1, 372', 32x, cut perpendicular to bedding: overview of angular sandstone texture.

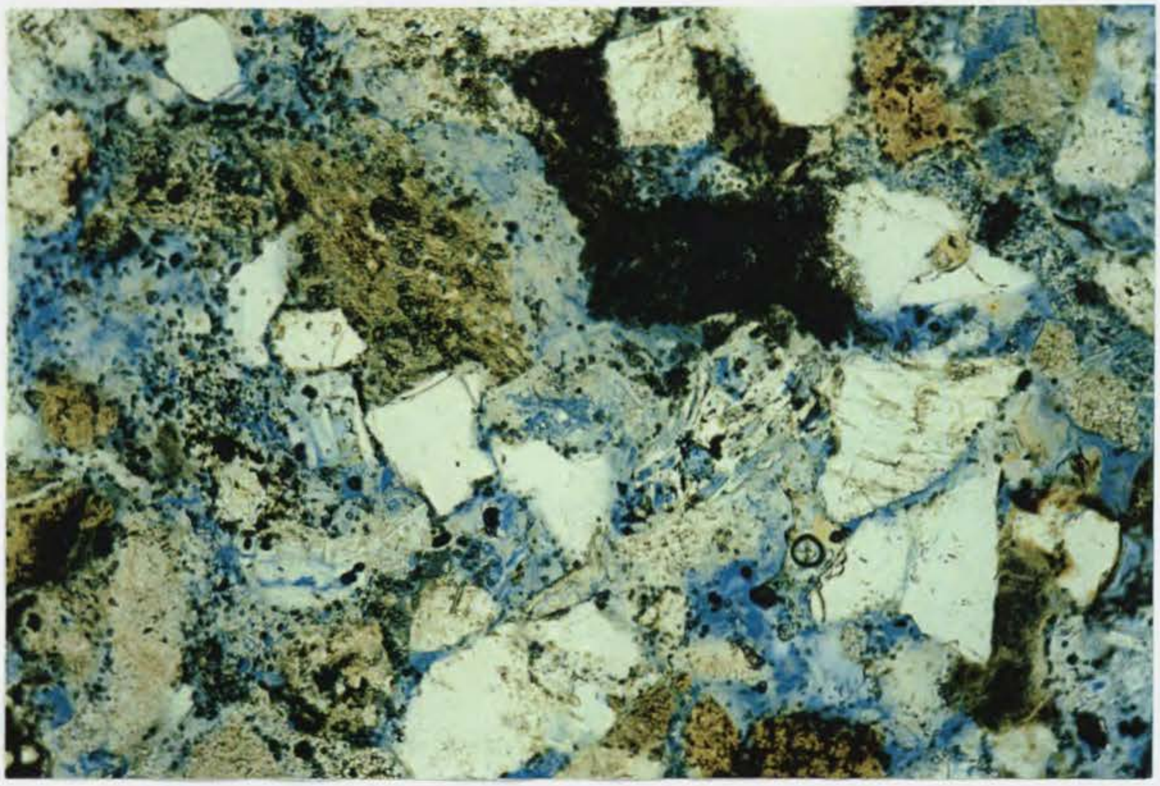


Photo #19: DH 95-1, 372', 120x; cut perpendicular to bedding: abundant rock fragments; feldspar, feldspathic rock fragments and altered rock fragments; siderite in matrix

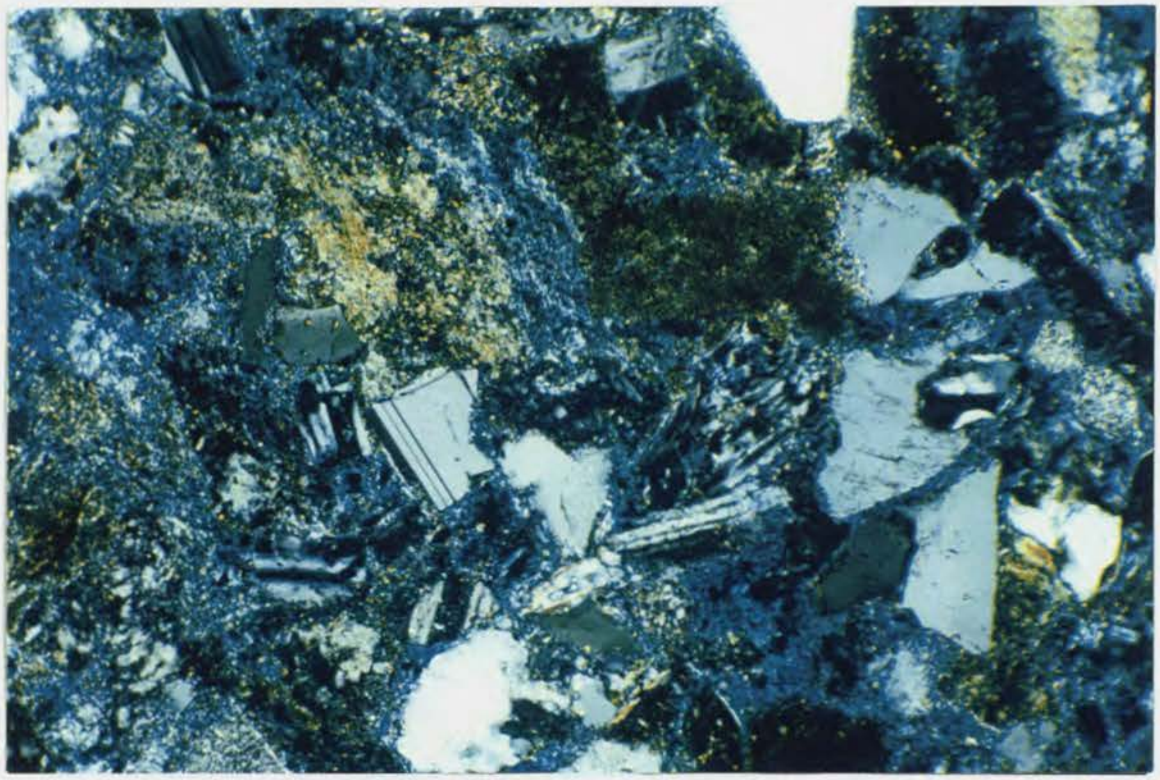


Photo #20: Same as above with crossed polars.

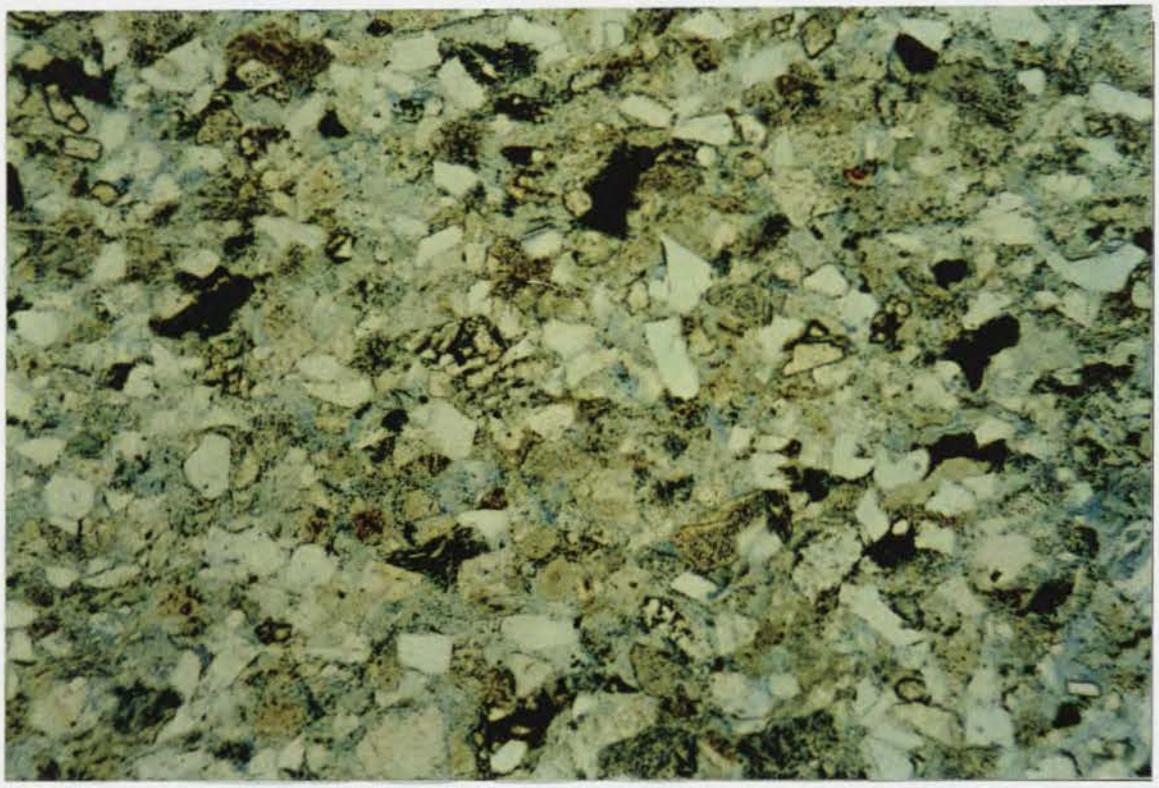


Photo # 21: DH 95-1, 384', 32x; cut perpendicular to bedding; overview showing abundant feldspars, altered rock fragment pseudomatrix, detrital dolomite and microcrystalline siderite in matrix

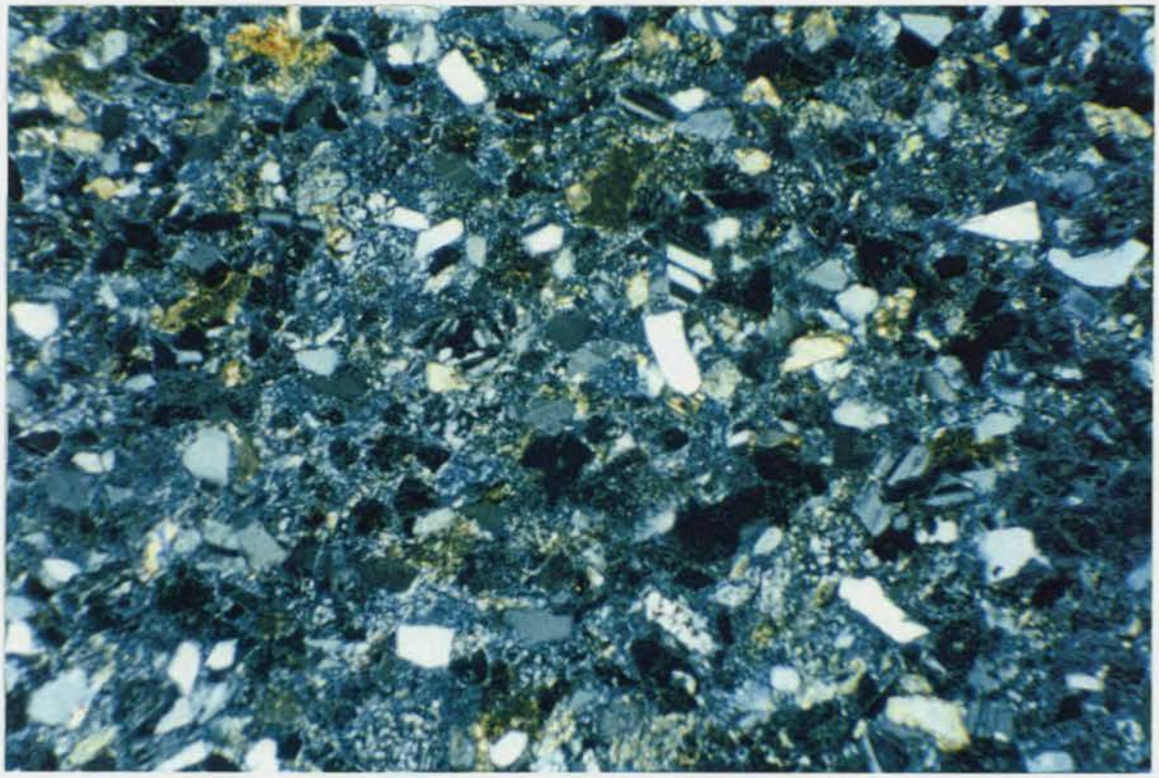


Photo #22: Same as above with crossed polars

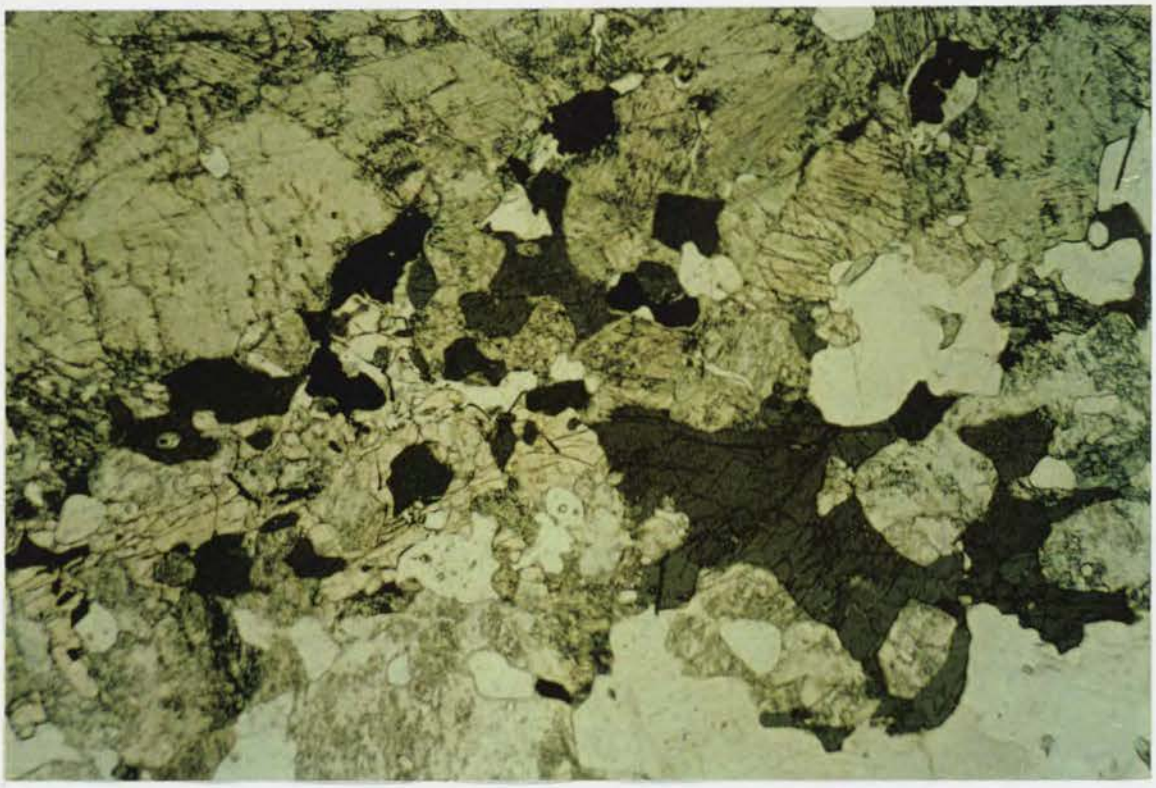


Photo #23: Thin section of hand sample Cat#006, 32x: irregularly banded gneiss; hornblende, quartz, almandine, zoisite?, epidote/clinozoisite and clinopyroxene.

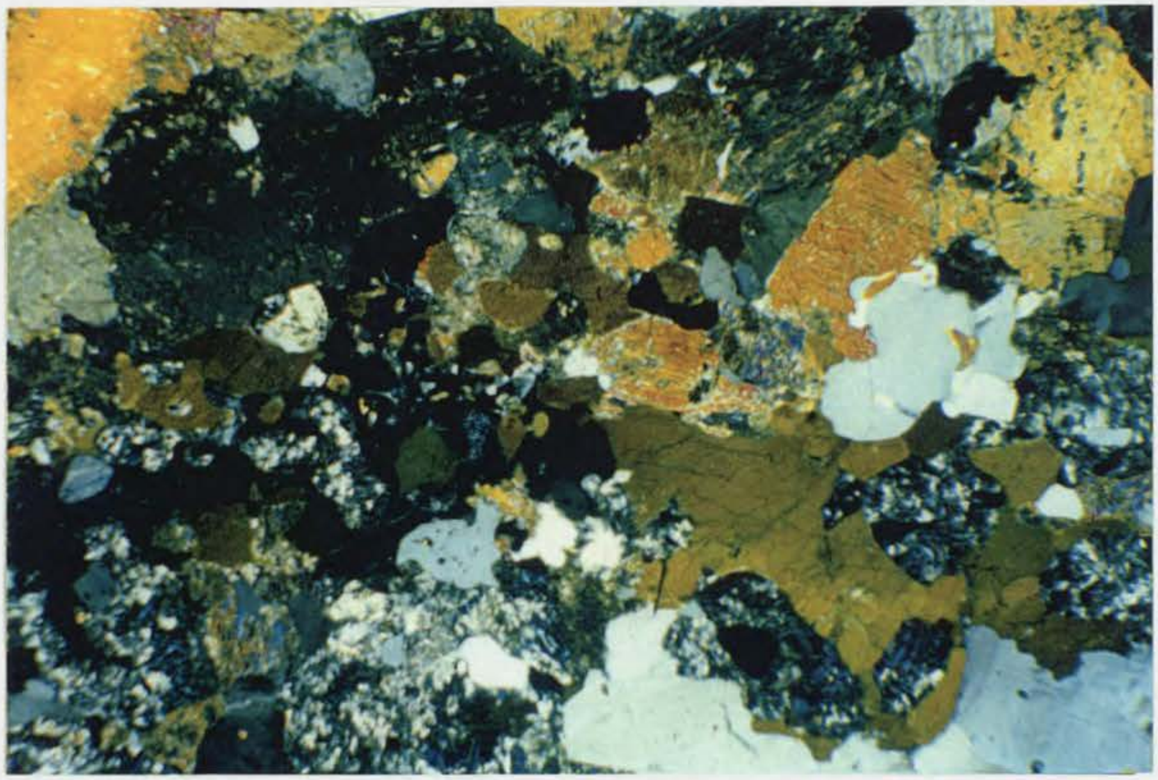


Photo #24: Same as above with crossed polars.

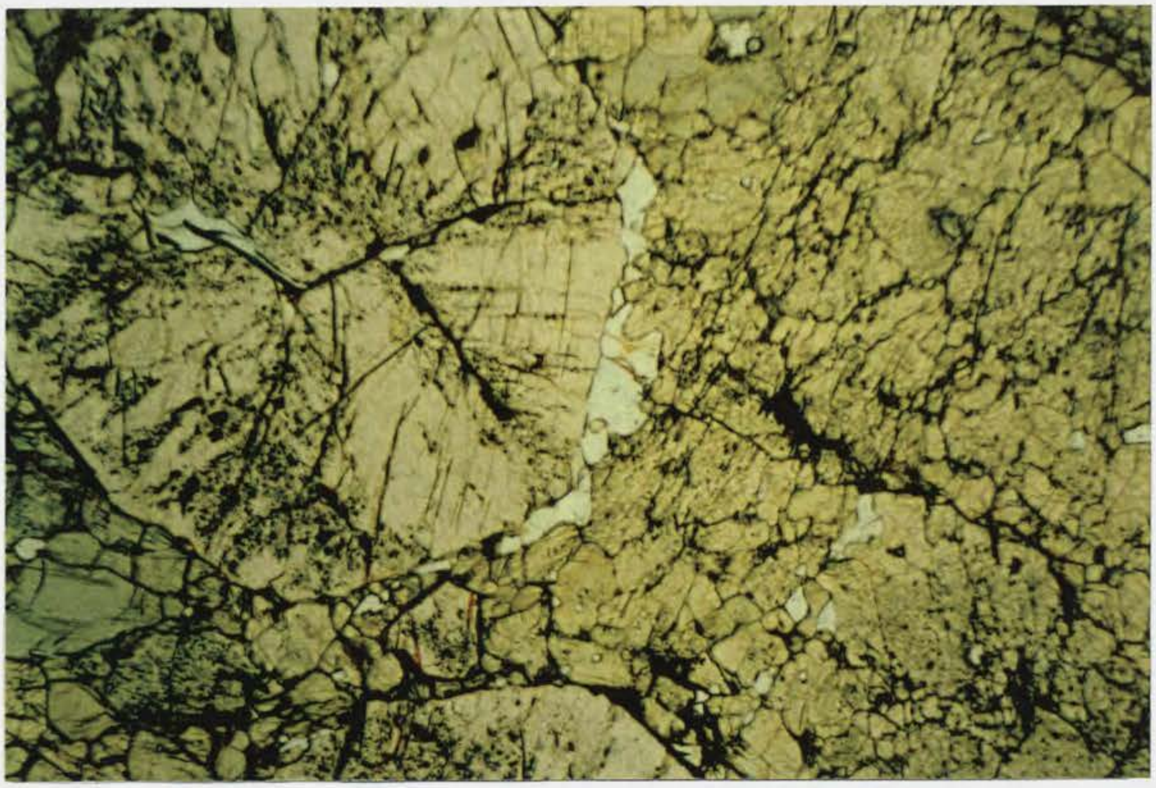


Photo # 25: Thin section of hand sample Cat.#002, 32x: possible eclogite facies metamorphism; pyroxene, garnet and minor quartz

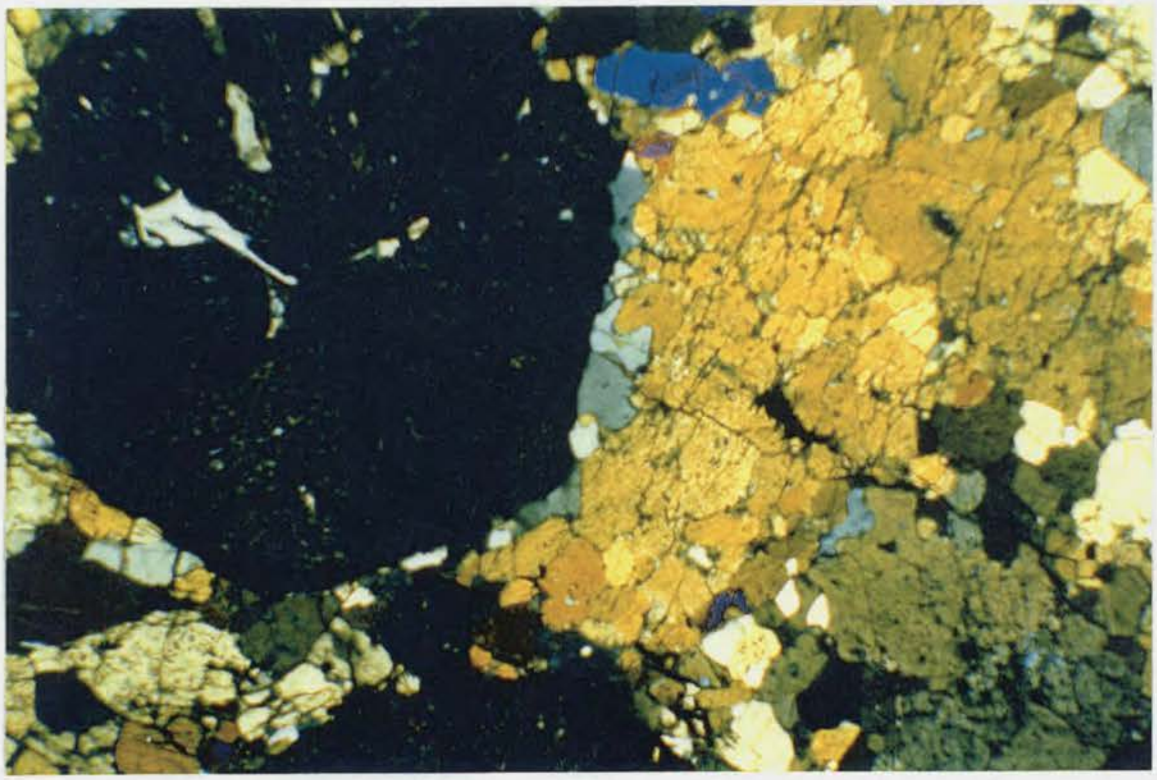


Photo #26: Same as above with crossed polars.

Photo #27: Thin section of hand sample Cat.#003, 32x: granulite facies metamorphism; granular gar., qtz , fsp., bi., amphibole and cpx metamorphically developed at the expense of cloudy plagioclase.

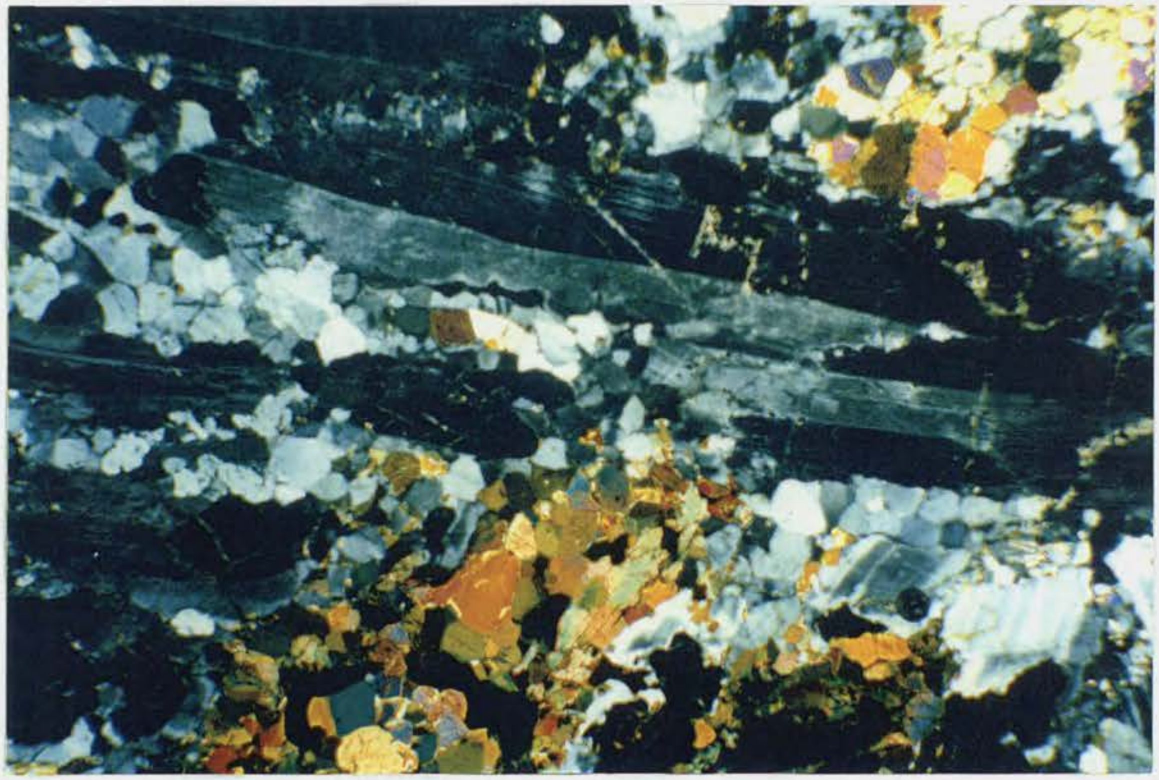
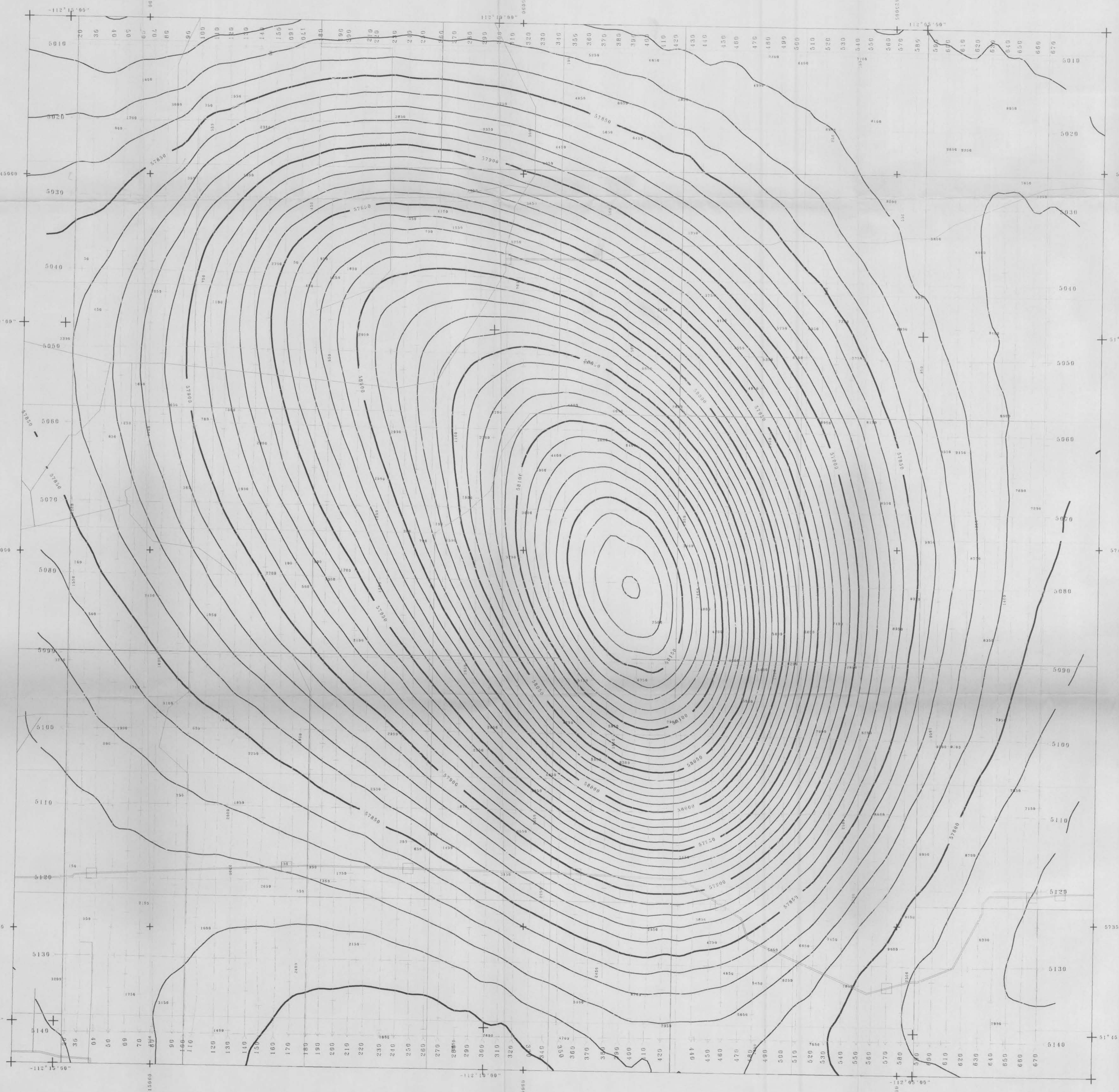


Photo #28: Same as above with crossed polars.



PROCESSING

FINAL PROCESSED DATA
CULTURALLY EDITED
NOT IGRF REDUCED
REDUCED TO POLE
LEVELLED DATA SET

WELL SYMBOL LEGEND

GENERAL
- Well currently drilling
- Suspended well
- Dry hole
- Tight hole, abandoned
- Tight hole, suspended
- Water injector

DISCOVERIES
- ● Oil well
- Oil shows
- Gas well
- Gas shows
- Oil and gas well
- Oil and gas shows
- Gas/condensate well
- Gas discovery with oil shows

APPRAISALS
- Oil appraisal
- Gas appraisal
- Oil and gas appraisal

SUSPENSIONS
- Oil appraisal, suspended
- ● Oil discovery, suspended
- Gas appraisal, suspended
- Gas discovery, suspended
- Oil and gas appraisal, suspended
- Oil and gas discovery, suspended

Scale 1:25000
1 0 0.5 1 1.5 2 Kilometers
1 0 0.5 1 Miles

51.78N 112.15W; 721m; 1997-05-31

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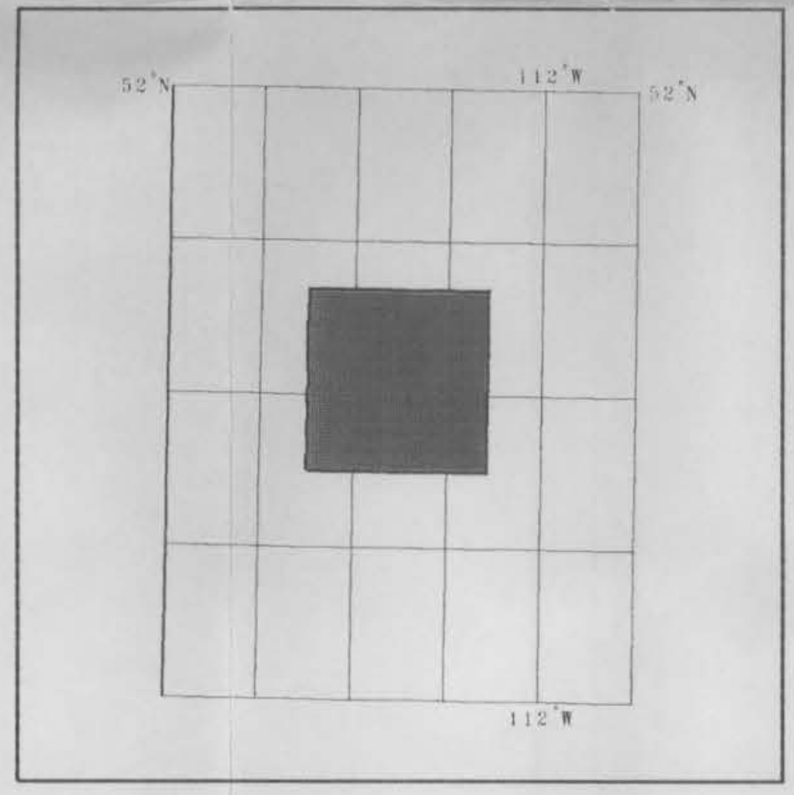
Magnetic Inclination: 75.06
Magnetic Declination: 17.65



SURVEY PARAMETERS

FLOWN BY: SPECTRA AVIATION SERV. CORP.

TRAVERSE LINE SPACING: 200 METERS
CONTROL LINE SPACING: 1000 METERS
FLYING HEIGHT: 85 m DRAPE
SPHEROID: CLARKE 1866

PROJECTION PARAMETERS

PROJECTION: UTM
ELLIPSOID: CLARKE 1866
UNITS: METERS
CENTRAL MERIDIAN: -111 DEGREES WEST
LATITUDE ORIGIN: 0.0 DEGREES
SCALE FACTOR: 0.9996
FALSE EASTING: 500000.0 METERS
FALSE NORTHING: 0.0 METERS

656405 ALBERTA LTD.

HANNA SURVEY
HIGH RESOLUTION AEROMAG DATA

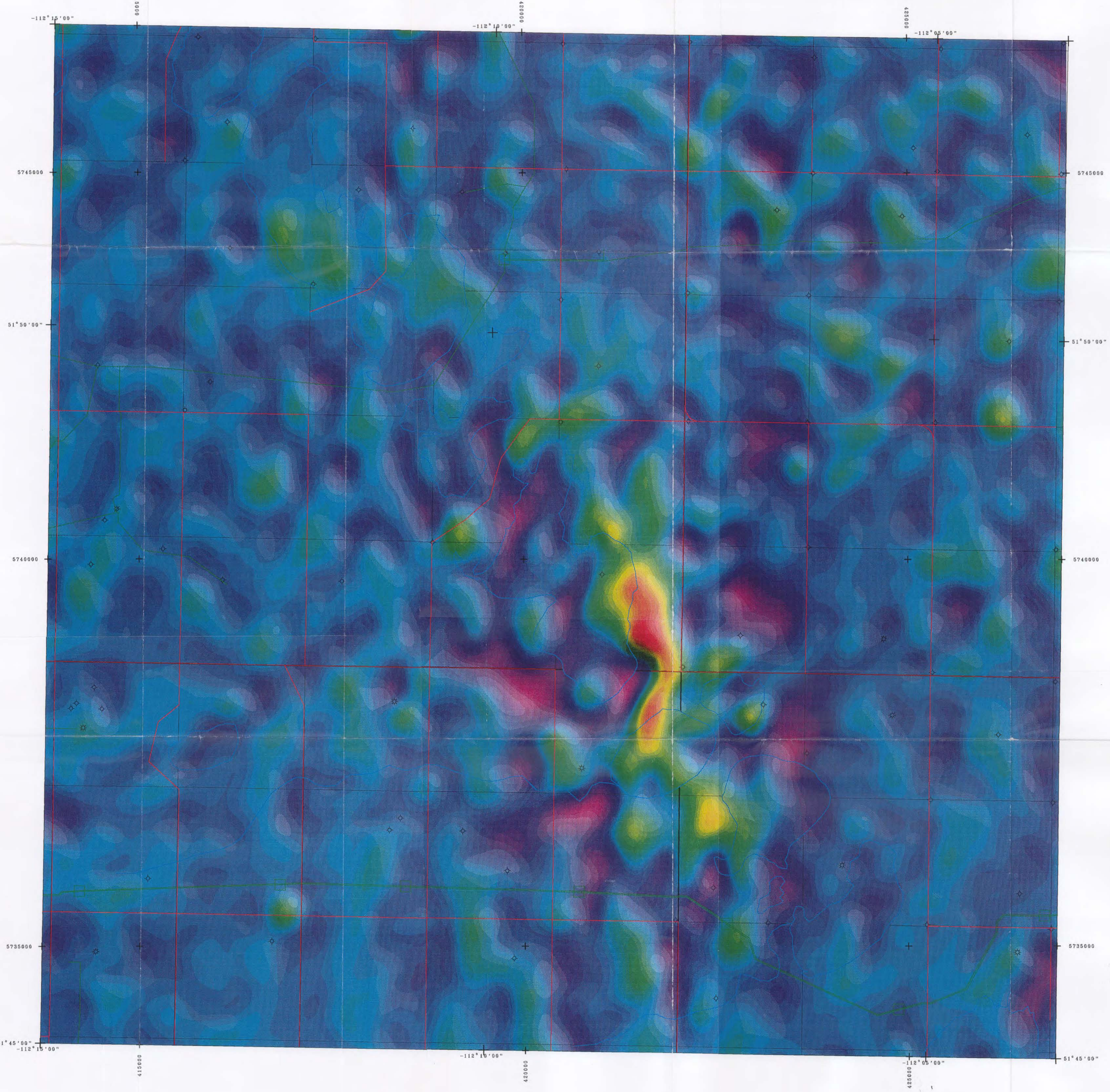
SPECTRA Exploration Geoscience Corp.

① 19980013

TOTAL INTENSITY CONTOURS & FLIGHT PATH

Date: 1997-09-05

ELS Consulting Inc./kr



PROCESSING

FINAL PROCESSED DATA
CULTURALLY EDITED
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LEVELLED DATA SET

WELL SYMBOL LEGEND

GENERAL
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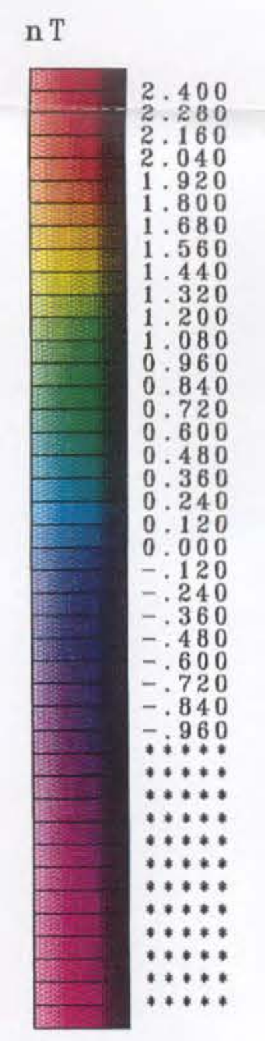
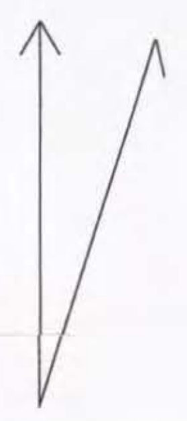
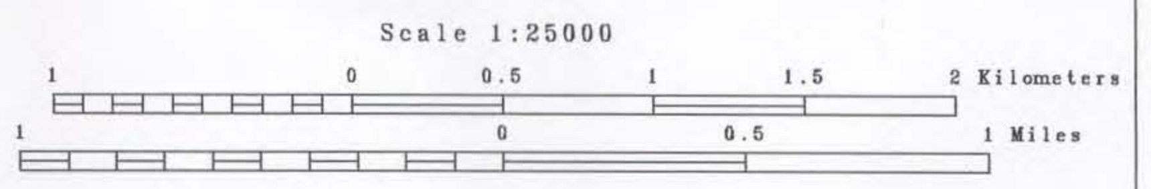
SUSPENSIONS
- Oil appraisal, suspended
- Oil discovery, suspended
- Gas appraisal, suspended
- Gas discovery, suspended
- Oil and gas appraisal, suspended
- Oil and gas discovery, suspended

SHADED RELIEF PARAMETERS

LINEAR STRETCH
SUN ANGLES:
Azimuth: 40 DEGREES
Elevation: 30 DEGREES







51.78N 112.15W; 721m; 1997-05-31

Magnetic Field:	58665.23 nT
Magnetic Inclination:	75.06
Magnetic Declination:	17.65

SURVEY PARAMETERS

FLOWN BY: SPECTRA AVIATION SERV. CORP.

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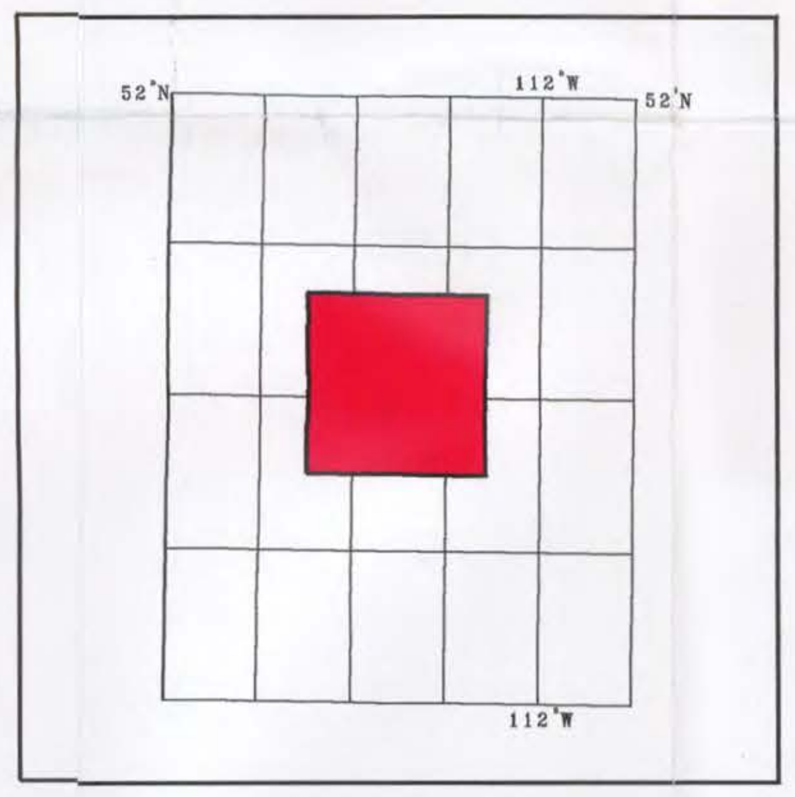
CONTROL LINE SPACING:	1000 METERS
FLYING HEIGHT:	95 m DRAPE
SPHEROID:	CLARKE 1866



PROJECTION PARAMETERS

PROJECTION:	UTM
ELLIPSOID:	CLARKE 1866
UNITS:	METERS
CENTRAL MERIDIAN:	-111 DEGREES WEST
LATITUDE ORIGIN:	0.0 DEGREES
SCALE FACTOR:	0.9996
FALSE EASTING:	500000.0 METERS
FALSE NORTHING:	0.0 METERS

656405 ALBERTA LTD.

HANNA SURVEY
BANDPASS OF TOTAL INTENSITY

SPECTRA Exploration Geoscience Corp.

(D) 19980013

500 m - 1,900 m, reduced to pole

Date: 1997-06-23

ELS Consulting Inc./kr

Appendix I

Type Section
of the
Horseshoe Canyon Formation
(Irish, 1970)

Stewart, J. S., 1919, Geology of the Disturbed Belt of southwestern Alberta; Geol. Surv. Can., Mem. 112.

——, 1943, Bassano, Alberta; Geol. Surv. Can., Map 741A.

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——, 1956, Uppermost Cretaceous and Paleocene nonmarine molluscan faunas of Western Alberta; Geol. Surv. Can., Mem. 280.

Tyrrell, J. B., 1887, Report on a Part of Northern Alberta and Portions of the Adjacent Districts of Assiniboia and Saskatchewan; Geol. Surv. Can., Ann. Rept. 1886, new. ser., v. II, pt. E, p. 1-176.

Wells, G. C., 1957, The Sweetgrass Arch area - Southern Alberta; Guidebook, Seventh Annual Field Conference; Alberta Soc. Petrol. Geol.

Williams, E. P., 1949, Cardston, Alberta; Geol. Surv. Can., Paper 49-3.

——, 1951, St. Mary River Formation in Spring Coulee - Magrath Area, Alberta; Bull. Am. Assoc. Petrol. Geol., vol. 35, pp. 885-898.

Williams, G. D., and Burk, C. F., Jr., 1964, Upper Cretaceous *in* Geological History of Western Canada; Alberta Soc. Petrol. Geol., p. 169-189.

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Williams, M. Y., and Dyer, W. S., 1930, Geology of southern Alberta and southwestern Saskatchewan; Geol. Surv. Can., Mem. 163.

APPENDIX

Section 1. Type section of Horseshoe Canyon Formation
Section 2. Type section of Scollard Member

Section 1. Composite section measured along Red Deer River valley between Sec. 7, Tp. 28, Rge. 18W4 and Sec. 7, Tp. 34, Rge. 21W4.

Unit	Lithology	Thickness (ft)	Height Above Base (ft)
	This part of section measured in Sec. 7, Tp. 34, Rge. 21W4.		
	BATTLE FORMATION		
3	Clay shale, brownish to purplish black, mauve-weathering, soft; extremely bentonitic; "popcorn-like" texture when weathered	10.0	26.9
2	Tuff, hard, brittle, brownish grey, light grey-weathering; vuggy (Kneehills tuff)	0.9	16.9
1	Clay shale, brownish to purplish black, mauve-weathering; soft; extremely bentonitic; "popcorn-like" texture when weathered	16.0	16.0
	WHITEMUD FORMATION		
1	Sandstone, argillaceous and shale, sandy; sandstone, grey to greenish grey, white-weathering, soft, friable; in part crossbedded; contains lenses and thin beds of sandy shale. Contact with overlying Battle is abrupt	14.0	
	HORSESHOE CANYON FORMATION (Type Section)		
115	Shale, grey, weathering grey, bentonitic	3.0	748.1
114	Sandstone, green-grey, buff-weathering, fine-grained; concretionary	3.0	745.1
113	Shale, grey, weathering grey, bentonitic	20.0	742.1
112	Sandstone, fine-grained, soft, argillaceous, bentonitic, grey, weathering light grey; unit contains numerous ironstone beds from 3 inches to 6 inches thick	15.0	722.1
111	Coal and fossilized wood, fossil tree stump; unit has 2 inches of dark grey, fissile shale both above and below the coal	3.0	707.1
110	Sandstone, fine-grained, argillaceous, grey, weathering light buff-grey; unit mainly soft but contains 3 layers about 10 in thick of hard, grey, brown-weathering, crossbedded sandstone	10.0	704.1
109	Coal and carbonaceous shale	0.8	694.1
108	Sandstone, argillaceous soft, friable, fine-grained, grey to light buff, weathering buff; well bedded with shaly and carbonaceous partings	16.0	693.3
107	Coal	0.7	677.3
106	Shale, silty interbedded with siltstone; shale, clayey and silty, grey, weathering grey; siltstone, grey, weathering grey	11.0	676.6
105	Sandstone, fine-grained, grey, weathering light grey; mainly soft and argillaceous; contains coaly partings near base; top of unit is 1 ft of very hard, fine-grained, calcareous, grey, buff-weathering sandstone	10.0	665.6
104	Sandstone, hard, fine-grained, grey, weathering buff, crossbedded	1.0	655.6
103	Ironstone, concretionary bed; green, weathering red-brown	0.5	654.6
102	Shale, bentonitic, soft, grey, grey-weathering; near base of unit are 2 bands of soft brown shale each about 1 in thick	13.0	654.1
101	Sandstone with much interbedded siltstone and silty shale; sandstone, argillaceous, fine-grained, grey, weathering light grey; siltstone, grey, weathering grey; shale, clayey, green, weathering buff. Unit contains several 2-in-thick, hard, crossbedded sandstone beds and numerous 2- to 4-in-thick concretionary, red-brown ironstone beds	26.0	641.1
100	Shale, soft, greenish grey, weathering buff; interbedded with sandstone, fine-grained, grey, weathering grey; sandstone beds as much as 3 ft thick (dinosaur bone)	27.0	615.1
99	Sandstone, argillaceous, bentonitic, fine-grained, grey, weathering light grey; interbedded with shale, silty, brownish grey, weathering buff; unit contains some thin ironstone bands	16.0	588.1
98	Sandstone, soft, argillaceous, bentonitic, fine-grained, grey, weathering light grey; unit contains 3 beds, from 1 to 2 ft thick, of hard, grey, crossbedded, brown-weathering, sandstone	32.0	572.1
97	Sandstone, siltstone, and silty shale in about equal amounts. Sandstone, fine-grained, soft, argillaceous, grey, weathering light grey; siltstone, argillaceous, grey, weathering grey; shale green, weathering light buff; 2 ft of coaly shale about 15 ft above base of unit	35.0	540.1
	This part of section measured in Sec. 10, Tp. 30, Rge. 21W4		
96	Limestone, sandy and sandstone, calcareous; grey, grey-weathering, hard, dense; contains *Corbicula occidentalys* and *Ostrea glabra* (Drumheller marine tongue of Allan and Sanderson, 1945)	2.0	505.1
95	Sandstone, fine-grained, grey, light grey-weathering, argillaceous, bentonitic	10.0	503.1
94	Siltstone and silty shale interbedded. Siltstone, grey, grey-weathering, argillaceous; shale, green-grey, silty, soft, bentonitic, light buff-weathering	7.0	493.1
93	Sandstone, fine-grained, grey, light grey-weathering argillaceous, bentonitic; contains 2 bands of red-brown weathering ironstone about 2 in thick	6.0	486.1

92	Shale, silty, light green-grey, grey- to buff-weathering soft, bentonitic	5.0	480.1
91	Sandstone, fine-grained, grey, light grey-weathering, argillaceous, bentonitic; contains 3 bands of red-brown weathering ironstone; contains band of hard, calcareous, concretionary, grey, buff-weathering sandstone, 4 in thick	10.0	475.1
90	Siltstone, argillaceous, grey, grey-weathering	3.0	465.1
89	Sandstone, argillaceous, soft, bentonitic, fine-grained, grey, grey-weathering; contains carbonaceous partings about ¼ in thick	3.0	462.1
88	Shale, silty, soft, bentonitic, grey, grey-weathering	8.0	459.1
87	Sandstone, fine-grained, grey, light grey-weathering, argillaceous, bentonitic	3.0	451.1
86	Sandstone, fine-grained, calcareous, hard, grey, buff-weathering	2.0	448.1
85	Sandstone, fine-grained, soft, argillaceous, bentonitic, grey, light grey-weathering; bedded with carbonaceous remains along bedding surfaces; limestone pod or lens in upper part of unit, lense is 4 ft thick and about 20 ft long	12.0	446.1
84	Siltstone, hard, grey, grey-weathering	2.0	434.1
83	Sandstone, soft, argillaceous, well bedded; carbonaceous partings along bedding surfaces; grey, buff-weathering; unit contains several thin (3-in) lenses of shale and 4 thin (3-in) ironstone bands	4.0	432.1
82	Shale, soft, bentonitic, green-grey, grey-buff weathering; in part silty; several thin (1 to 2 in) red-brown weathering ironstone bands	11.0	428.1
81	Coal with 4-in-thick parting near middle of hard red-brown sandstone	2.0	417.1
80	Shale, soft, brownish grey, buff-grey weathering	2.5	415.1
79	Sandstone, grey, weathering light grey, friable, fine-grained, bentonitic; contains several thin (2 in thick) dark grey, silty shale beds	9.5	412.6
78	Shale, carbonaceous, brown, weathering brown; thin coaly stringers	1.0	403.1
77	Shale and silty shale, dark grey, grey and brown-weathering; unit contains much plant debris	9.0	402.1
76	Shale, carbonaceous, in part fissile, brown, brown-weathering; much plant debris	1.0	393.1
75	Sandstone, fine-grained, argillaceous, soft, grey, light grey-weathering	3.0	392.1
74	Shale and silty shale, soft, greenish grey, grey-weathering	14.0	389.1
73	Coal	2.0	375.1

This part of section measured in Sec. 34, Tp. 29, Rge. 21W4

72	Shale, soft, grey-buff, buff-weathering	3.5	373.1
71	Sandstone, fine-grained, grey, light grey-weathering, soft, argillaceous, friable; unit contains coaly stringers and 2 thin (2 in thick) beds of red-brown weathering ironstone	4.0	369.6
70	Shale, soft, grey, grey-buff weathering	3.0	365.6
69	Sandstone, soft, argillaceous, bentonitic, grey, light grey-weathering; some interbedded shale, grey to green, grey-weathering; scattered ironstone concretions	10.5	362.6
68	Coal	1.0	352.1
67	Shale, grey-brown, buff-weathering	2.7	351.1
66	Sandstone, grey, light grey-weathering, soft, fine-grained; 3 ironstone beds each 2 in thick	2.0	348.4
65	Shale, soft, bentonitic, in part silty, grey, grey-weathering; surface of unit stained by numerous contained ironstone beds	5.0	346.4
64	Coal and coaly shale	3.0	341.4

63	Shale, in part silty or sandy, grey, grey-weathering, unit contains plant remains and coal stringers	7.0	338.4
62	Sandstone, soft, argillaceous, bentonitic, grey, buff-grey weathering, fine-grained, bedded; coal and carbonaceous partings along bedding surfaces	5.0	331.4
61	Sandstone, soft, friable, bentonitic, argillaceous, fine-grained, grey, light grey-weathering; massive and crossbedded; contains large, hard, calcareous sandstone concretions and lenses as well as ironstone nodules	20.5	326.4
60	Shale, soft, bentonitic, grey, dark grey-weathering; unit contains small, scattered ironston nodules	6.5	305.9
59	Ironstone concretionary bed	1.0	299.4
58	Sandstone, fine-grained, argillaceous, bentonitic, friable, light grey, light grey-weathering; massive and crossbedded; some argillaceous or carbonaceous partings	11.5	298.4
57	Sandstone, hard, calcareous, grey, buff-weathering, crossbedded	1.0	286.9
56	Sandstone, soft, argillaceous, fine-grained, grey, grey-weathering; interbedded with siltstone, grey, grey-weathering	8.5	285.9
55	Shale, fissile, carbonaceous, dark grey, brown-weathering	0.3	277.4
54	Shale, soft, greenish grey, bentonitic, grey-buff weathering; unit contains 4 thin ironstone beds each about 3 in thick	8.0	277.1
53	Sandstone and siltstone. Sandstone, fine-grained, grey, grey-weathering; intercalated siltstone beds or lenses are grey and grey-weathering	5.0	269.1
52	Shale, grey and dark grey, dark grey-weathering; unit contains coaly stringers	2.5	264.1
51	Shale, silty and siltstone, grey, grey-weathering	6.0	261.6
50	Ironstone, sandy, concretionary, brown-weathering	0.3	255.6
49	Coal	3.0	255.3

Note. The coal seam at the base of the measured partial section in Sec. 34, Tp. 29, Rge. 21W4 is a 3-ft-thick single seam. At the top of measured partial section in Sec. 13, Tp. 29, Rge. 20W4 (at Drumheller) this seam consists of 3 benches of coal 2.8, 1, and 1.7 ft thick, each separated by about 1 ft of carbonaceous shale

This part of section measured in Sec. 13, Tp. 29, Rge. 20W4

48	Shale, dark grey, brown-weathering, carbonaceous	0.9	252.3
47	Siltstone, soft, brown-grey, buff-grey weathering	2.5	251.4
46	Shale, fissile, carbonaceous, brown, brown-weathering	0.5	248.9
45	Shale, silty, soft, bentonitic, grey, grey-weathering	14.0	248.4
44	Sandstone, massive, crossbedded in part, fine-grained, argillaceous, bentonitic, grey, light grey-weathering	5.5	234.4
43	Shale, grey, grey-weathering, bentonitic, silty	3.5	228.9
42	Ironstone concretionary bed, red-brown weathering	0.5	225.4
41	Shale, carbonaceous, in part fissile, brown, brown-weathering; unit contains in middle a 4-in thickness of shaly coal	1.5	224.9
40	Siltstone and fine-grained sandstone: grey, grey-weathering, bentonitic; at 4 ft above base of unit is 6 in of carbonaceous, grey shale	8.0	223.4
39	Sandstone, fine-grained, argillaceous, bentonitic, grey, very light grey-weathering	6.8	215.4
38	Ironstone concretionary bed, red-brown weathering	1.0	208.6
37	Shale, silty, grey, grey-weathering	6.5	207.6
36	Coal	0.8	201.1
35	Shale, silty and some siltstone, grey, grey-weathering, bentonitic	23.5	200.3

34	Sandstone, fine-grained, argillaceous, bentonitic, light grey, light grey-weathering; contains some thin, shaly lenses and several thin ironstone beds	5.0	176.8
33	Coal	3.0	171.8
	This part of section measured in Sec. 15, Tp. 28, Rge. 19W4		
32	Shale, soft, brownish grey, buff-weathering, bentonitic, contains plant debris	7.0	168.8
31	Coal	3.0	161.8
30	Shale, soft, brown, brown-weathering	2.0	158.8
29	Shale, silty or sandy, grey, grey-weathering	6.0	156.8
28	Shale, silty, carbonaceous, dark grey, dark grey-weathering	1.5	150.8
27	Coal	1.5	149.3
26	Shale, silty, grey, grey-weathering; contains plant debris	1.0	147.8
25	Sandstone, argillaceous, bentonitic, soft, grey, light grey-weathering; contains lenses and large concretions (2 to 6 ft) of hard, calcareous, crossbedded, grey, buff-weathering sandstone. Unit contains carbonaceous detritus	8.0	146.8
24	Shale, silty, grey, grey-weathering; bentonitic, unit stained brown on surface by presence of an ironstone bed one inch thick	3.2	138.8
23	Coal	1.5	135.6
22	Shale, silty, coaly, carbonaceous	0.3	134.1
21	Sandstone, soft, argillaceous, bentonitic, grey, light grey-weathering	5.0	133.8
20	Shale, silty shale, and argillaceous siltstone, bentonitic, grey-buff-weathering	6.0	128.8
19	Coal	3.0	122.8
18	Shale, brown, buff-weathering	0.8	119.8
17	Sandsone, fine-grained, argillaceous, bentonitic, bedded, grey, very light grey-weathering	9.0	119.0
16	Shale, silty in part, bentonitic, grey to dark grey, buff-weathering	6.5	110.0
15	Sandstone, argillaceous, fine-grained, bentonitic, grey, light grey-weathering	2.5	103.5
14	Shale, silty, grey and dark grey-weathering, bentonitic; unit contains 5 to 6 thin (3 in) ironstone concretionary beds	8.5	101.0
13	Shale, dark grey, dark grey-weathering; calcareous in part; unit contains *ostrea* coquina near Willow Creek; contains also 2 bentonite beds (2 in and 3 in thick)	5.0	92.5
12	Sandstone, fine-grained, argillaceous, bentonitic, banded grey and brown, banded grey and buff on weathered surface	3.0	87.5
11	Shale, silty, bentonitic, dark grey, dark grey-weathering	4.0	84.5
10	Coal	4.0	80.5
	This part of section measured in Sec. 7, Tp. 28, Rge. 18W4		
9	Shale, silty, coaly, dark grey to brown, brown-weathering	0.5	76.5
8	Sandstone, fine-grained, argillaceous, bentonitic, grey, very light grey-weathering; 8 ft above base of unit is bed of hard, calcareous, grey, buff-weathering sandstone	20.0	76.0
7	Shale, silty, grey-brown, buff-weathering; contains 3 thin (½ in) concretionary, red-brown weathering ironstone beds	2.0	56.0
6	Sandstone, fine-grained, argillaceous, bentonitic, massive, light grey, light grey-weathering; one 3-in-thick ironstone bed about 3 ft above base	8.5	54.0
5	Shale, silty, bentonitic, grey, grey-weathering; 1 inch of dark grey shale at base of unit	7.0	45.5
4	Coal	2.0	38.5
3	Shale, soft, bentonitic, grey, grey-weathering; unit contains coaly stringers	6.0	36.5

2	Shale, bentonitic, silty or sandy, brownish grey, buff-grey weathering; basal 3 ft of unit composed of laminated shale and siltstone	6.5	30.5
1	Sandstone, soft, friable, argillaceous, bentonitic, fine-grained, light grey, light grey weathering; unit includes 3 zones of hard, grey, calcareous, brown-weathering sandstone about 6 to 10 inches thick; unit also contains thin beds and lenses (2 inches to 12 inches) of brown, brown-weathering shale	24.0	24.0

Note: Base of this unit is arbitrarily chosen base of Horseshoe Canyon Formation

Underlying beds: interbedded and interlensed, grey, light grey-weathering sandstone and chocolate brown, silty shale. Proportion of sandstone increases upward. Unit is transitional between Bearpaw and Edmonton Group. 3.0+

Section 2. East side of Red Deer River about 5 miles west of Scollard (sec. 7, Tp. 31, Rge. 21W4).

Overlying beds: Pleistocene sand and clay

SCOLLARD MEMBER (Type Section)

13	Shale, green; interbedded with grey siltstone and sandstone; poorly exposed	10.0	161.0
12	Coal, weathered, friable	4.0	151.0
11	Shale, grey, weathering grey; interbedded with grey, buff-weathering, silty shale and siltstone	12.0	150.0
10	Shale, grey, weathering grey and dull yellow-grey; in part sandy	13.0	138.0
9	Sandstone, brown-grey, weathering buff, hard, well bedded	3.0	125.0
8	Shale, grey-green, weathering buff	4.2	122.0
7	Ironstone, discontinuous concretionary bed; red-brown weathering	0.8	117.8
6	Sandstone, grey, weathering grey, pepper-and-salt; some intercalated brown-weathering beds as much as 6 in thick	12.0	117.0
5	Shale, silty to sandy, grey, weathering grey and buff; unit contains some thin yellow-brown-weathering beds	38.0	105.0
4	Sandstone, grey, weathering grey; in part argillaceous; thick-bedded to massive; unit contains 6 hard, calcareous, brown-weathering, crossbedded, sandstone beds and nodules	45.0	67.0
3	Shale, black, weathering grey; probably bentonitic	6.0	22.0
2	Sandstone, soft, grey, weathering grey; unit contains 3 beds of hard, brown-weathering sandstone each about 6 in thick	14.0	16.0
1	Shale, green, weathering grey	2.0	2.0

BATTLE FORMATION

1	Shale, purplish black, weathering mauve-grey, very bentonitic, rubbly; unit contains Kneehills Tuff bed about 5 ft below top	20.0	20.0

Underlying beds: Whitemud Formation

Appendix II

Data from Initial
Ground Based Magnetic Surveys
of
Lake 4 and Pearl Lake

Magnetic Survey of Lake 4, Chain Lakes, Alberta, February 12, 1997

Grid Coordinates:			Mag Readings:		Notes:
West	South	Time	Field	Corrected	
104	0	9:25 AM	5,862	5,862	Barbed Wired Fence
0	0	9:33 AM	5,868	5,868	Barbed Wired Fence
104	25	9:38 AM	5,865	5,865	Barbed Wired Fence
104	50	9:40 AM	5,865	5,865	Barbed Wired Fence
104	75	9:41 AM	5,863	5,863	Barbed Wired Fence
104	100	9:43 AM	5,868	5,868	Barbed Wired Fence
100	125	9:48 AM	5,864	5,864	Lake
100	150	9:49 AM	5,867	5,867	Lake
100	175	9:51 AM	5,867	5,867	Lake
100	200	9:53 AM	5,865	5,865	Lake
100	225	9:54 AM	5,870	5,870	Lake
100	250	9:56 AM	5,867	5,867	Lake
100	275	9:58 AM	5,868	5,868	Lake
100	300	10:00 AM	5,867	5,867	Lake
100	325	10:02 AM	5,872	5,872	Lake
100	350	10:03 AM	5,868	5,868	Lake
100	375	10:04 AM	5,874	5,874	Lake
75	375	10:06 AM	5,868	5,868	Lake
50	375	10:08 AM	5,872	5,872	Lake
100	400	10:10 AM	5,865	5,865	Lake
100	425	10:13 AM	5,866	5,866	Lake
100	450	10:14 AM	5,866	5,866	Lake
100	475	10:16 AM	5,869	5,869	Lake
100	500	10:17 AM	5,873	5,873	Lake
100	525	10:19 AM	5,863	5,863	Lake
75	500	10:20 AM	5,871	5,871	Lake
125	500	10:22 AM	5,868	5,868	Lake
100	550	10:24 AM	5,869	5,869	Lake
100	575	10:25 AM	5,865	5,865	Lake
100	600	10:27 AM	5,869	5,869	Lake
104	625	10:29 AM	5,873	5,873	Iron Fence Posts
100	650	10:32 AM	5,868	5,868	No barbed wire yet.
100	675	10:34 AM	5,867	5,867	
100	700	10:36 AM	5,872	5,872	
100	725	10:38 AM	5,873	5,873	
100	750	10:39 AM	5,866	5,866	
75	700	10:47 AM	5,869	5,869	
50	700	10:50 AM	5,867	5,867	
25	700	10:52 AM	5,866	5,866	
0	700	10:54 AM	5,867	5,867	
0	675	10:57 AM	5,869	5,869	
0	650	10:59 AM	5,868	5,868	
0	625	11:00 AM	5,870	5,870	
0	600	11:02 AM	5,866	5,866	
0	575	11:04 AM	5,867	5,867	
0	550	11:06 AM	5,869	5,869	
0	525	11:07 AM	5,866	5,866	
0	500	11:09 AM	5,871	5,871	

Magnetic Survey of Lake 4, Chain Lakes, Alberta, February 12, 1997

Grid Coordinates:			Mag Readings:		Notes:				
West	South	Time	Field	Corrected					
0	475	11:11 AM	5,865	5,865					
0	450	11:13 AM	5,866	5,866					
0	425	11:14 AM	5,868	5,868					
0	400	11:16 AM	5,866	5,866					
0	375	11:18 AM	5,866	5,866					
0	350	11:19 AM	5,867	5,867					
0	325	11:21 AM	5,870	5,870					
25	325	11:22 AM	5,872	5,872					
0	300	11:24 AM	5,868	5,868					
0	275	11:25 AM	5,867	5,867					
0	250	11:27 AM	5,873	5,873					
0	225	11:28 AM	5,866	5,866					
0	200	11:30 AM	5,864	5,864					
0	175	11:32 AM	5,867	5,867					
0	150	11:33 AM	5,864	5,864					
0	125	11:34 AM	5,862	5,862					
0	100	11:36 AM	5,867	5,867					
0	75	11:37 AM	5,867	5,867					
0	50	11:39 AM	5,867	5,867					
0	25	11:40 AM	5,870	5,870					
0	0	11:42 AM	5,867	5,867					
104	0	11:45 AM	5,862	5,862	No Mag drift				
104	0	12:28 PM	5,862	5,862					
125	0	12:28 PM	5,864	5,864					
150	0	12:29 PM	5,867	5,867					
200	0	12:30 PM	5,872	5,872					
250	0	12:33 PM	5,867	5,867					
300	0	12:35 PM	5,866	5,866					
350	0	12:37 PM	5,864	5,864					
400	0	12:39 PM	5,870	5,870					
450	0	12:41 PM	5,870	5,870					
500	0	12:53 PM	5,873	5,873					
550	0	12:47 PM	5,875	5,875					
600	0	12:49 PM	5,872	5,872					
650	0	12:51 PM	5,874	5,874					
700	0	12:53 PM	5,872	5,872					
750	0	12:55 PM	5,875	5,875					
800	0	12:57 PM	5,875	5,875					
850	0	1:00 PM	5,880	5,880		Barb wire fence			
900	0	1:04 PM	5,876	5,876					
926	0	1:07 PM	5,871	5,871		Barb wire fence			
900	100	1:12 PM	5,873	5,873					
850	100	1:18 PM	5,878	5,878					
800	100	1:20 PM	5,875	5,875					
750	100	1:24 PM	5,880	5,880					
700	100	1:25 PM	5,881	5,881					
650	100	1:27 PM	5,878	5,878					
600	100	1:30 PM	5,873	5,873					
550	100	1:33 PM	5,869	5,869					

Magnetic Survey of Lake 4, Chain Lakes, Alberta, February 12, 1997

Grid Coordinates:			Mag Readings:		Notes:				
West	South	Time	Field	Corrected					
500	100	1:35 PM	5,870	5,870					
450	100	1:38 PM	5,870	5,870					
400	100	1:47 PM	5,869	5,869					
350	100	1:49 PM	5,867	5,867					
300	100	1:53 PM	5,873	5,873					
250	100	1:57 PM	5,868	5,868					
200	100	1:59 PM	5,871	5,871					
150	100	2:01 PM	5,870	5,870					
50	200	2:05 PM	5,866	5,866					
150	200	2:11 PM	5,867	5,867					
200	200	2:12 PM	5,872	5,872					
250	200	2:12 PM	5,866	5,866					
300	200	2:15 PM	5,874	5,874					
300	175	2:17 PM	5,877	5,877					
300	150	2:18 PM	5,881	5,881					
300	125	2:20 PM	5,875	5,875					
275	150	2:21 PM	5,870	5,870					
325	150	2:23 PM	5,869	5,869					
350	200	2:26 PM	5,869	5,869					
400	200	2:28 PM	5,867	5,867					
450	200	2:29 PM	5,875	5,875					
500	200	2:31 PM	5,877	5,877					
550	200	2:34 PM	5,877	5,877					
600	200	2:36 PM	5,872	5,872					
650	200	2:37 PM	5,872	5,872					
700	200	2:40 PM	5,877	5,877					
750	200	2:42 PM	5,878	5,878					
800	200	2:44 PM	5,880	5,880	Lake Edge				
800	250	2:46 PM	5,876	5,876					
800	300	2:48 PM	5,879	5,879					
750	293	2:51 PM	5,874	5,874					
700	286	2:53 PM	5,874	5,874					
650	279	2:55 PM	5,874	5,874					
600	272	2:57 PM	5,876	5,876					
550	266	2:59 PM	5,879	5,879					
500	259	3:07 PM	5,873	5,873					
500	300	3:09 PM	5,870	5,870					
500	400	3:12 PM	5,881	5,881					
500	375	3:12 PM	5,873	5,873					
500	350	3:15 PM	5,872	5,872					
500	325	3:16 PM	5,876	5,876					
450	300	3:18 PM	5,876	5,876					
400	300	3:22 PM	5,874	5,874					
350	300	3:24 PM	5,875	5,875					
300	300	3:26 PM	5,874	5,874					
250	300	3:27 PM	5,875	5,875					
200	300	3:29 PM	5,873	5,873					
150	300	3:30 PM	5,865	5,865					
100	300	3:32 PM	5,867	5,867	No Mag Drift				

Magnetic Survey of Lake 4, Chain Lakes, Alberta, February 12, 1997

Grid Coordinates:			Mag Readings:		Notes:				
West	South	Time	Field	Corrected					
50	300	3:33 PM	5,867	5,867					
150	400	4:05 PM	5,869	5,869					
200	400	4:06 PM	5,869	5,869					
250	400	4:08 PM	5,871	5,871					
300	400	4:09 PM	5,871	5,871					
350	400	4:11 PM	5,872	5,872					
400	400	4:13 PM	5,872	5,872					
450	400	4:15 PM	5,872	5,872					
500	400	4:18 PM	5,874	5,873					
500	450	4:20 PM	5,874	5,873					
500	500	4:25 PM	5,874	5,873					
550	400	4:30 PM	5,875	5,874					
600	400	4:32 PM	5,875	5,874					
650	400	4:33 PM	5,875	5,874					
700	400	4:35 PM	5,877	5,876					
450	500	4:41 PM	5,874	5,873					
400	500	4:46 PM	5,874	5,873					
350	500	4:49 PM	5,873	5,872					
300	500	4:51 PM	5,872	5,871					
250	500	4:52 PM	5,872	5,871					
200	500	4:54 PM	5,876	5,875					
150	500	4:55 PM	5,870	5,869					
100	500	4:57 PM	5,869	5,868	1:25:00	1			
50	500	4:58 PM	5,868	5,867					
150	600	5:01 PM	5,870	5,869					
200	600	5:03 PM	5,869	5,868					
250	600	5:04 PM	5,871	5,870					
300	600	5:06 PM	5,871	5,869					
350	600	5:08 PM	5,872	5,870					
400	600	5:10 PM	5,873	5,871					
450	600	5:12 PM	5,873	5,871	475w = Lake Edge				
400	650	5:16 PM	5,873	5,871	Lake				
400	700	5:19 PM	5,872	5,869	Lake				
350	700	5:21 PM	5,871	5,868	Lake				
300	700	5:22 PM	5,870	5,867	Lake				
300	750	5:24 PM	5,871	5,868	Lake				
250	700	5:26 PM	5,870	5,867	Lake				
200	700	5:28 PM	5,869	5,866	175w = Lake Edge				
150	700	5:29 PM	5,869	5,866					
200	650	5:32 PM	5,871	5,868					
100	400	5:40 PM	5,868	5,865	0:43:00	3			
104	0	5:50 PM	5,866	5,862		4			

Magnetic Survey of Pearl Lake, Chain Lakes, Alberta, March 3, 1997

West	South	Gammas	Time					
4	4	5,835	9:41					
20	4	5,843	9:40					
4	50	5,841	9:44					
40	4	5,842	9:47					
60	4	5,842	9:47					
80	4	5,842	9:48					
100	4	5,843	9:49					
120	4	5,841	9:50					
140	4	5,841	9:50					
160	4	5,842	9:51					
180	4	5,841	9:51					
200	4	5,841	9:52					
220	4	5,842	9:56					
240	4	5,841	9:57					
260	4	5,842	9:57					
280	4	5,842	9:58					
300	4	5,842	9:59					
320	4	5,842	10:00					
340	4	5,842	10:01					
360	4	5,841	10:02		360			
380	4	5,842	10:02					
400	4	5,842	10:03					
400	50	5846	10:05					
400	75	5486	10:06					
400	100	5845	10:07					
420	4	5845	10:10					
440	4	5845	10:11					
460	4	5846	10:11					
480	4	5846	10:12					
500	4	5846	10:13					
520	4	5846	10:14					
540	4	5846	10:14					
560	4	5846	10:15					
580	4	5846	10:16					
600	4	5847	10:17					
600	25	5847	10:19					
600	50	5841	10:20					
600	75	5842	10:21					
600	100	5843	10:21					
620	0	5843	10:24					
640	0	5843	10:25					
660	0	5843	10:25					
680	0	5843	10:26					
700	0	5843	10:27					
720	0	5844	10:27					
740	0	5843	10:28					
760	0	5844	10:29					
780	0	5844	10:29					
800	0	5843	10:30					

Magnetic Survey of Pearl Lake, Chain Lakes, Alberta, March 3, 1997

West	South	Gammas	Time					
800	25	5843	10:31					
800	50	5843	10:32					
800	75	5843	10:33					
800	100	5843	10:34					
820	0	5845	10:38					
840	0	5844	10:38					
860	0	5843	10:39					
880	0	5844	10:40					
900	0	5844	10:40					
920	0	5845	10:41					
940	0	5843	10:42					
960	0	5844	10:43					
980	0	5846	10:44					
1000	0	5843	10:45					
1000	25	5843	10:46					
1000	50	5844	10:47					
1000	75	5844	10:47					
1000	100	5843	10:48					
980	50	5844	10:54					
960	50	5844	10:55					
940	50	5844	10:55					
920	50	5843	10:56					
900	50	5843	10:56					
880	50	5843	10:57					
860	50	5844	10:58					
840	50	5843	10:59					
820	50	5843	10:59					
800	50	5843	11:00	5843				
780	50	5843	11:01					
760	50	5843	11:01					
740	50	5843	11:02					
720	50	5842	11:02					
700	50	5843	11:03					
680	50	5843	11:06					
660	50	5842	11:06					
640	50	5842	11:07					
620	50	5842	11:07					
620	25	5843	11:09					
620	70	5843	11:09					
610	50	5843	11:10					
600	50	5842	11:11	5841				
580	50	5842	11:15					
560	50	5842	11:15					
540	50	5842	11:16					
540	25	5843	11:17					
520	50	5842	11:18					
500	50	5842	11:19					
480	50	5842	11:19					
460	50	5842	11:20					

Magnetic Survey of Pearl Lake, Chain Lakes, Alberta, March 3, 1997								
West	South	Gammas	Time					
440	50	5842	11:21					
420	50	5841	11:22					
400	50	5842	11:22	5846				
380	50	5841	11:24					
360	50	5842	11:24					
340	50	5842	11:25					
320	50	5841	11:26					
300	50	5841	11:26					
280	50	5841	11:27					
260	50	5841	11:27					
240	50	5841	11:28					
220	50	5841	11:29					
200	50	5841	11:30					
200	75	5841	11:31					
200	100	5841	11:32					
180	50	5840	11:34					
160	50	5841	11:35					
140	50	5841	11:36					
120	50	5841	11:37					
100	50	5841	11:37					
80	50	5841	11:38					
60	50	5840	11:39					
40	50	5840	11:39					
20	50	5838	11:40					
4	50	5840	11:41	5,841	- 1			
4	4	5831	11:42	5,835	- 4			
4	75	5839	11:48					
4	100	5841	11:49					
20	100	5841	11:50					
40	100	5840	11:51					
60	100	5841	11:52					
80	100	5840	11:53					
100	100	5841	11:54					
120	100	5841	11:54					
140	100	5841	11:55					
160	100	5841	11:56					
180	100	5840	11:56					
200	100	5841	11:57					
200	125	5841	11:59					
200	150	5841	11:59					
220	100	5841	12:03					
240	100	5841	12:04					
260	100	5841	12.05					
280	100	5841	12:05					
300	100	5841	12:06					
320	100	5842	12:07					
340	100	5841	12:08					
360	100	5842	12:08					
380	100	5842	12:09					

Magnetic Survey of Pearl Lake, Chain Lakes, Alberta, March 3, 1997

West	South	Gammas	Time					
400	100	5840	12:10	5845	-5			
400	125	5841	12:11					
400	150	5841	12:12					
420	100	5841	12:14					
440	100	5842	12:15					
460	100	5841	12:16					
480	100	5842	12:16					
500	100	5842	12:17					
520	100	5843	12:18					
540	100	5842	12:19					
560	100	5842	12:19					
580	100	5843	12:20					
600	100	5842	12:21	5843	-1			
620	100	5846	12:35	5842				
620	120	5846	12:36	5842				
620	80	5848	12:37	5844				
600	50	5845	12:38	5841	4			
640	100	5846	12:40	5842				
660	100	5846	12:40	5842				
680	100	5847	12:41	5843				
700	100	5846	12:42	5842				
720	100	5846	12:42	5842				
740	100	5846	12:43	5842				
760	100	5846	12:44	5842				
780	100	5846	12:45	5842				
800	100	5847	12:46	5843	4			

Appendix III

Data from

EM34 Reconnaissance Survey

Chain Lakes Property

EM 34 Survey

40 metre Coil Spacing

30-Jul-97

by: Steve and Lynn Ross and Andy Glatiotis

Location			Horizontal	Vertical					
Line		Station	Field	Field					
400	S	20	110	53					
400	S	40	110	31					
400	S	60	130	50					
400	S	80	120	60					
400	S	100	120	66					
400	S	140	120	59					
400	S	180	120	52					
400	S	200	120	68					
400	S	220	115	58					
400	S	240	115	58					
400	S	260	110	74					
400	S	280	112	73					
400	S	300	110	67					
400	S	320	115	62					
400	S	340	110	44					
400	S	360	110	45					
400	S	380	110	58					
400	S	400	110	49					
400	S	420	110	37					
400	S	440	115	51					
400	S	460	115	78					
400	S	480	122	81					
400	S	500	130	37					
400	S	520	130	66					
400	S	540	140	62					
400	S	560	140	35					
400	S	580	150	59					
400	S	600	150	44					
400	S	620	160	25					
400	S	640	150	34					
400	S	660	155	38					
400	S	680	150	51					
400	S	700	145	58					
400	S	720	150	47					
350	S	20	135	65	13:00				
350	S	40	135	55					
350	S	60	135	62					
350	S	80	135	55					
350	S	100	135	48					
350	S	120	125	40					
350	S	140	125	47					
350	S	160	125	76					
350	S	180	120	63					

Chain Lakes Property

EM 34 Survey

40 metre Coil Spacing

30-Jul-97

by: Steve and Lynn Ross and Andy Glatiotis

Location			Horizontal	Vertical					
Line		Station	Field	Field					
350	S	200	120	57					
350	S	220	115	54					
350	S	240	115	66					
350	S	260	115	66					
350	S	280	110	60					
350	S	300	110	65					
350	S	320	100	66					
350	S	340	100	56					
350	S	360	100	54					
350	S	380	110	52					
350	S	400	110	55					
350	S	420	120	68					
350	S	440	120	65					
350	S	460	130	64					
350	S	480	130	78					
350	S	500	140	48					
350	S	520	145	38					
350	S	540	154	60					
350	S	560	150	50					
350	S	580	145	17					
350	S	600	150	48					
350	S	620	140	54					
350	S	640	145	62					
350	S	660	140	51					
350	S	680	135	55					
350	S	700	135	45					
350	S	720	135	38					
350	S	740	130	40					
350	S	760	135	51					
350	S	780	135	69	12:00				
300	S	20	140	14	13:45				
300	S	40	155	46					
300	S	60	140	44					
300	S	80	150	56					
300	S	100	140	47					
300	S	120	135	46					
300	S	140	125	60					
300	S	160	125	68					
300	S	180	120	40					
300	S	200	110	54					
300	S	220	110	66					
300	S	240	110	70					
300	S	260	110	51					
300	S	280	100	61					

Chain Lakes Property

EM 34 Survey

40 metre Coil Spacing

30-Jul-97

by: Steve and Lynn Ross and Andy Glatiotis

Location			Horizontal	Vertical					
Line		Station	Field	Field					
300	S	300	105	60					
300	S	320	105	54					
300	S	340	105	42					
300	S	360	100	63					
300	S	380	105	68					
300	S	400	110	63					
300	S	420	120	62					
300	S	440	130	44					
300	S	460	135	60					
300	S	480	150	61					
300	S	500	150	42					
300	S	520	160	45					
300	S	540	160	45		very sensitive			
300	S	560	160	36		very sensitive			
300	S	580	160	41					
300	S	600	150	52					
300	S	620	150	50					
300	S	640	135	80					
300	S	660	125	74					
300	S	680	125	62					
300	S	700	130	32					
300	S	720	130	50					
300	S	740	135	70					
300	S	760	135	62					
300	S	780	140	48	12:00				
250	S	20	110	74	15:40				
250	S	40	110	58					
250	S	60	120	48					
250	S	80	120	70					
250	S	100	130	60					
250	S	120	130	40					
250	S	140	130	50					
250	S	160	125	60					
250	S	180	130	64					
250	S	200	130	63					
250	S	220	125	72					
250	S	240	130	48					
250	S	260	140	26					
250	S	280	130	30					
250	S	300	165	58					
250	S	320	105	67					
250	S	340	99	64					
250	S	360	105	57					
250	S	380	110	45					

Chain Lakes Property

EM 34 Survey

40 metre Coil Spacing
30-Jul-97
by: Steve and Lynn Ross and Andy Glatiotis

Location			Horizontal	Vertical	
Line		Station	Field	Field	
250	S	400	120	63	
250	S	420	125	48	
250	S	440	140	37	
250	S	460	150	52	
250	S	480	160	30	
250	S	500	150	44	
250	S	520	160	66	
250	S	540	165	32	
250	S	560	160	32	
250	S	580	155	53	
250	S	600	150	54	
250	S	620	150	54	
250	S	640	145	46	
250	S	660	140	34	
250	S	680	140	48	
250	S	700	130	56	
250	S	720	135	73	
250	S	740	125	66	
250	S	760	130	47	
250	S	780	140	38	14:40
0	S	20	82	72	16:00
0	S	40	82	72	
0	S	60	83	63	
0	S	80	80	63	
0	S	100	82	57	
0	S	120	86	60	
0	S	140	86	59	
0	S	160	88	69	
0	S	170	86	67	
0	S	180	90	68	
0	S	200	83	68	
0	S	220	85	80	
0	S	240	90	70	
0	S	260	92	48	
0	S	280	95	43	
0	S	300	98	52	
0	S	320	97	59	
0	S	340	92	58	
0	S	360	88	56	
0	S	380	86	76	
0	S	400	85	74	
0	S	420	96	72	
0	S	440	120	70	
0	S	460	110	32	

Chain Lakes Property

EM 34 Survey

40 metre Coil Spacing

30-Jul-97

by: Steve and Lynn Ross and Andy Glatiotis

Location			Horizontal	Vertical	
Line		Station	Field	Field	
0	S	480	120	42	
0	S	500	115	60	
0	S	520	120	47	
0	S	540	115	50	
0	S	560	130	33	
0	S	580	140	36	16:40
100	N	20	72	66	17:26
100	N	40	72	67	
100	N	60	77	67	
100	N	80	83	66	
100	N	100	82	74	
100	N	120	86	61	
100	N	140	82	55	
100	N	160	84	50	
100	N	180	78	57	
100	N	200	80	72	
100	N	220	82	64	
100	N	240	82	50	
100	N	260	80	48	
100	N	280	85	61	
100	N	300	78	57	
100	N	320	78	64	
100	N	340	76	67	
100	N	360	80	51	
100	N	380	80	44	
100	N	400	85	64	
100	N	420	83	74	
100	N	440	87	60	
100	N	460	88	62	
100	N	480	86	56	
100	N	500	94	57	
100	N	520	94	48	
100	N	540	93	70	
100	N	560	98	56	
100	N	580	115	60	16:40

Appendix IV

Palynological Age Determinations

by

Branta Biostratigraphic Ltd.

DH: 95-1

Haimila samples

Two samples from each ends of a core submitted by Mike Clark were palynologically analysed for age determinations and paleoenvironments. The upper sample was a brown mudstone and the lower sample was a glauconitic sandstone. Abundant and well preserved samples were present in both samples indicating a Late Campanian to possibly earliest Maastrichtian age. Nearshore marine environments with freshwater influx

Unless otherwise noted, single specimens were observed.

Sample 1: Brown mudstone Core A 314'

Age & Zone

Late Campanian to possibly earliest Maastrichtian

Mancicorpus tripodiformis Zone.

Dinoflagellates

Canningia sp.
Ceratiopsis sp.
Cribroperidinium sp.
Dinoflagellata indet.
Spinidinium densispinatum

Angiosperm Pollen

Aquilapollenites attenuatus	(Common)
Aquilapollenites reticulatus	(Rare)
Cranwellia striata	
Fibulipollis pusilus	
Integricorpus sp	
Loranthacites sp.	
Mancicorpus minimum	
Mancicorpus tripodiformis	
Pachysandra cretacea	
Retitricolpites spp.	
Tricolporopollenites spp.	

Gymnosperm Pollen

Piceaepollenites spp.	(Common)
Pinuspollenites spp.	
Taxodiaceaepollenites hiatus	(Common)

Byrophyte & Pteridophyte Spores

Baculatisporites comaunensis	
Balmesporites sp B. Snead'69	
Camarozonosporites dakotaensis	
Cicatricosisporites spp.	(Rare)
Concavissimisporites variverruccatus	
Cyathidites spp.	
Gleicheniidites senonicus	
Interlobites triangularis	(Rare)
Laevigatosporites ovatus	(Common)
Lycopodiumsporites austroclavitidites	(Common)
Osmundacidites claytonites	
Rouseisporites radiatus	

Other Algae & Miscellanea

Pesavis sp. Ioannides & Mcintyre 1980 (Rare)
Schizophacus grandis

Paleoenvironment

The presence of rare marine dinoflagellates and rare freshwater algae indicates a nearshore marine, possibly brackish, environment such as a lagoon or estuary.

Comments

Late Campanian to possibly earliest Maastrichtian age..

Sample 2: Green sandstone Core B 322'

Age & Zone

Late Campanian to possibly earliest Maastrichtian

Mancicorpus tripodiformis Zone.

Dinoflagellates

Isabelidinium cooksoniae
Palaeoperidinium pyrophorum

Angiosperm Pollen

Aquilapollenites attenuatus
Aquilapollenites catenireticulatus
Aquilapollenites quadrilobatus (Common)
Aquilapollenites sp
Fibulipollis pusilus
Integricorpus #Ecicatricose
Integricorpus clarireticulatus (Rare)
Loranthacites sp.
Mancicorpus clavus
Mancicorpus tripodiformis

Gymnosperm Pollen

Abiespollenites spp.
Rugubivesiculites rugosus

Byrophyte & Pteridophyte Spores

Aequitriradites spp.
Balmesporites sp. B. Snead'69
Cyathidites spp. (Rare)
Gabonisporis bacaricumulus (Rare)
Gleicheniidites senonicus
Isbelidinium belfastensis Kellstrom
Laevigatosporites ovatus (Common)
Lusatisporis dettmannae
Lycopodiumsporites austroclavitidites (Common)
Polypodiidites favus

Other Algae & Miscellanea

Pediastrum sp.
Schizophacus grandis (Rare)

Paleoenvironment

The presence of rare marine dinoflagellates and rare freshwater algae indicates a nearshore marine, possibly brackish, environment such as a lagoon or estuary.

Comments

black coaly material (Common)

The presence of *Cranwellia striata*, *Fibulispollis pusilus*, *and Mancicorpus tripodiformis* suggests a Late Campanian to possibly earliest Maastrichtian age. This is supported by the association with the dinoflagellates *Isabelidinium cooksoniae and Paleoperidinium pyrophorum* . The later species ranges from the Late Cretaceous into the Paleocene, however there are no other definitive Paleocene species.

THIN SECTION - SHOWED SHOCKED QUARTZ ? ACCORDING to M. Clark

pr

Haimila samples II

Two samples from cores 97-1 and 97-2 submitted by Mike Clark were palynologically analysed for age determinations and paleoenvironments. The First sample was a mudstone and the lower sample was a sandstone. Abundant and well preserved assemblages were present in the first sample indicating a Late Campanian to possibly earliest Maastrichtian age. Nearshore marine environments with high freshwater influx such as a *Polypodium* brackish water marsh is indicated. The second sample contains an impoverished assemblage of mixed origins. The age of the sample is taken to be represented by the youngest fossils which indicate an indefinite Campanian to Maastrictian age.

Unless otherwise noted, single specimens were observed.

Sample 1: Mudstone Core 97-2 100'

Age & Zone

Late Campanian to possibly earliest Maastrichtian

Mancicorpus tripodiformis Zone.

Dinoflagellates

Alterbidinium spp.	(Rare)
Canningia sp.	

Angiosperm Pollen

Aequitriradites spinulosus	
Aquilapollenitesattenuatus	
Aquilapollenitesquadrilobatus	(Rare)
Cranwelliastriata	(Common)
Fibulipollispusilus	(Rare)
Integricorpusclarireticulatus	
Laevigatosporitesovatus	(Dominant)
Liliaciditescomplexus	(Common)
Liliaciditessp.	(Rare)
Mancicorpusminimum	
Mancicorpustripodiformis	(Common)
Momipitescoryloides	
Pachysandracretacea	
Syncolpitessp.	

Gymnosperm Pollen

Piceaepollenitesspp.	(Common)
Pinuspollenitesspp.	(Rare)
Taxodiaceaepollenites hiatus	(Dominant)

Byrophyte & Pteridophyte Spores

Camarozonosporitesdakotaensis	
Camarozonosporitesinsignis	
Dltoidosporahallii	(Rare)
Gleicheniiditessenonicus	(Rare)
Gleicheniiditessp.	(Rare)
Hammulatisporitesloeblichii	(Rare)
Heliosporitesaltmarkensis	(Common)
Osmundaciditesclaytonites	(Rare)
Polypodiiditesfavus	(Common)
Reticulatisporitessp.	(Abundant)
Retitriletesspp.	
Rouseisporites stellatus	(Common)
Stereisporites stereoides	(Common
Triletes bettianus	

Other Algae & Miscellanea

Schizophacus grandis
Schizophacus parvus

Paleoenvironment

The presence of rare brackish water dinoflagellates and rare freshwater algae indicates a nearshore marine, possibly brackish, environment such as close proximity to a Polypodium brackish water marsh or lagoon.

Comments

The presence of *Cranwellia striata, Fibulispollis pusilus, and Mancicorpus tripodiformis* suggests a Late Campanian to possibly earliest Maastrichtian age..

Sample 2: Sandstone Core 97-1 174' 4"

Age & Zone

Campanian to Maastrichtian
Indeterminate Zone.

Dinoflagellates

Isabelidinium cooksoniae	*(Rare*

Angiosperm Pollen

Kurtzipites spp.
Penitetrapites mollis

Gymnosperm Pollen

Abiespollenites spp.	
Araucariacites australis	
Cedripites canadensis	(Rare)
Corollina torosa	(Rare)
Ephedripites virginiensis	
Exesipollenites tumulus	
Pinuspollenites spp.	(Rare)

Byrophyte & Pteridophyte Spores

Cicatricosisporites #ECE	
Cicatricosisporites spp.	(Rare)
Deltoidospora hallii	
Gleicheniidites senonicus	(Rare)
Laevigatosporites ovatus	(Rare)
Leiotriletes mecklenburgensis	
Polypodiidites favus	
Retitricolpites spp.	
Stereisporites stereoides	(Rare)
Striatriletes coronianus	

Other Algae & Miscellanea

Schizophacus parvus	(Rare)

Paleoenvironment

The presence of rare marine dinoflagellates and rare freshwater algae indicates a nearshore marine, possibly brackish, environment such as a lagoon or estuary.

Comments

black coaly material	(Common)

This sample is marked by a mixture of Mid Cretaceous and Late Cretaceous forms. Albian to Cenomanian components comprise *Penitetrapites mollis, Exesisporites tumulus, Ephedripites virginiensis* and *Striatriletes coronianus*. These forms as well as *Cedripites canadensis and Deltoidospora* are dark in colour and often fragmented suggesting that these forms were reworked into younger sediments. olThe presence of *Polypodium favus, Kurtzipites, and Isabelidinium cooksoniae* suggests a Campanian to Maastrichtian age. The exact age of this sample cannot be determined due to the impoverished assemblages..

Appendix V

Drill Hole Logs

Chain Lakes Property

Drill Hole: 95-1

Depth	Rock	Descriptive Comments
From	Type	
320	Silty	Light grey with abundant coally fragments and silty to fine sandy laminae.
	Mudstone	Occasional tan to light green, clay to mudstone clasts
		Bentonitic
		323': green and yellow mica, possible Cpx, angular black lithic frags.
		324': small bivalve mollusc
		325': red garnet @200x magnification
326	Bentonitic	graded bedding: sltstn grades upward into mdstn over 8"
	siltstone	occasional matrix supported clasts, soft at time of deposition.
		1 pink garnet; mica flakes (black, yellow, brown and green); coally fragments
		327': 2" band of light grey silty mudstone with med. grey mudstone r/u clasts
		332': light grey fine sandstone with mudstone and glauconitic? sandstone clasts
		one clast in finely laminated silts with coally laminae: clast placement inexplicable
		334': graded bedding from sandy to muddy over 2"; Cpx grain?
		335': 1" x-bedded sandstone; Cpx grain?
		336': light grey siltstone with interlaminated grey mudstone and mudstone clasts
		bioturbated
		337': red garnet, phlogopite, Cpx?
339	Mudstone	dark grey mudstone with coally bedding tops, strong bioturbation.
		occassional bentonitic layers.
		341': 2" clam shell
		342': 3" bentonitic silt
		348': wine red garnet in bentonitic mudstone
370	Sandstone	light grey, bentonitic, fine to medium grained sandstone with coally laminae
	bentonitic	grades upward into mudstone.
		Garnets: 3 lilac and 1 wine red; 1 Cpx; micas: black brown and white
		374': 3 garnets and 2 Cpx
		379'-383'; cross bedding in sandstone.
386		EOH

Chain Lakes Property

Drill Hole: 97-1

Depth From	Rock Type	Descriptive Comments
0	Till	dark brown clay till; lost circulation and drill bouncing on boulders at bottom.
50.0	Sandstone	Bentonitic, light grey sandstone: poor recovery
58.0	Mudstone	light brown with interlaminated silts
62.8	Coal	very crumbly when dry
63.2	Sandstone	bentonitic; panned: magnetite, garnets: 2 lilac + 5 deep red, zirc?
65.0	Coal	crumbly when dry
66.3	Siltstone	light grey and coally
70.0	Mudstone	finely interlaminated light grey silty claystone and brown mudstone
		82' - 92.5': fragments/clasts of lighter color mudstone, well rounded with long axis
		at assorted angles; scouring at base with underlying muds disturbed; poorly
		bedded; coally fragments abundant; Mudslide?
		91': very angular quartz grains, 1 garnet, magnetite and ilmenite
92.5	Coal	
98.0	Mudstone	Dark brown mudstone with matrix supported clasts of light coloured bentonitic
		sandstone; bedding at 80° to c/a
		98'-100.5': 40% clasts
		100.5' - 106.8: no clasts
		106.5' - 108': light colour siltstone with clasts of brown mudstone; clasts
		show rapid deposition; clasts subhorizontal
108.0	Coal	
108.8	Mudstone	Brown mudstone grading from coally on top to sandy on the bottom.
109.0	Sandstone	medium grained, light green, well sorted without well defined bedding.
		perfect bipyramidal quartz grains
117.7	Coal	bedding @ 85° to c/a
118.8	Sandstone	medium grained, light green, well sorted and bentonitic
		bedding @ 90° to c/a
		135' - 137': small white platy ?clasts? 1mm to 2 cm parallel to weak bedding.
		139' - 142': interlaminated bentonitic ss. and sandy bentonite
		144': euhedral quartz bipyramids, glauconite?, ilmenite, magnetite, and strange
		spheres made of marcasite? ball bearings; quartz extremely angular
		149.6' - 152': ss clasts? to 3" in diameter with well rounded edges supported in
		ss matrix; long axis parallel to bedding.

Chain Lakes Property

Drill Hole: 97-1

Depth From	Rock Type	Descriptive Comments
	Sandstone	152' - 153': silty claystone; 40% bentonite; quartz shards very sharp and angular;
		hexagonal bipyramid quartz grains; magnetite, ilmenite, chromite?
		153.2': 1cm x 4cm clay clast @ 70° to c/a
		154.5': 4cm brown clay bed; glauconite?, marcasite? ball-bearing spheres, quartz
		shards / extremely angular, frosted grains.
		154.6' - 160.7': medium grained, light grey ss with matrix supported ss clasts with
		brown clay rims: clasts at all angles to c/a.
		160.7' - 164': conglomerate of ss and mdst clasts to 6cm in diam.
		164' - 170': occas. ss clasts of sandstone and claystone.
		170.25' - 170.8': bentonitic ss, panned very angular quartz shards, magnetite,
		glauconite and abundant yellow carbonate crystals.
174.6	Claystone	bentonitic light green claystone with abundant pyritised diatoms and occassional
	silty	brown mudstone clasts
		179.2' - 186': very poor recovery; lumps of gooey clay
		186' -206': finely laminated clay mudstones with soft sed, deformation and small
		clasts above 3" clean glauconitic greywacke.
		207' - 217.8': very finely interlaminated brown mudstone and white, bentonitic
		siltstone
217.8	Sandstone	clean white, well sorted, crossbedded at base
220.7	Mudstone	very finely laminated brown mudstone and white siltstone
222.3	Sandstone	Clean, well sorted, greywacke
		229': crossbeds
252		EOH

Chain Lakes Property

Drill Hole: 97-2

Depth From	Rock Type	Descriptive Comments
0	Till	
40.0	Mudstone	Bentonitic, occas laminated siltstone clasts to 1"x 2"
		light bentonitic siltstone interbeds
		54.7' - 77.5': very poor recovery - cherty clast clogged bit and ground away the
		mudstone so that it just washed away as very fine cuttings.
		cherty clasts have very angular quartz shards and microbreccia textures.
		from a 6" sand interval: Garnets: lilac, orange and deep red; Cpx, Opx, Olivine?,
		magnetite, chromite?, ilmenite grains seen under scope.
		51.4' - 52': light siltstone; garnet, tourmaline, zircon, magnetite and cpx in panned
		concentrate of shaved core.
		53.5' - 54': sandstone interbed: garnet, magnetite, chromite?, ilmenite and zircon
		panned in concentrate from shaved core.
		78': 3" x 1.5" sandstone 'clast' in laminated mudstone
		84': 2" x 1" sandstone 'clast' with fossil fragments in mudstone
97.5	Coal	45° bedding to c/a
99.0	Mudstone	brown, bentonitic
105.3'	Coal	
106.0	Mudstone	brown, bentonitic
118.0	Coal	116' bedding to c/a = 48°
122.0	Siltstone	light grey, fine grained, bentonitic to varying degrees
		127' - 134': rythmic interlaminated brown mud and light grey silts every 3" to 4"
		132': panned minor magnetite, marcasite spherules and zircon
		177': 3" bentonite bed; panned very angular quartz shards, zircon, and carbonate
		177' - 187': Thin coally laminae and coally fragments abundant
		186': bedding to c/a = 49°
187	Sandstone	light grey, bentonitic, fine grained and interlaminated with silts and clays at top
		grading down into sands; clasts of sandstone and mudstone common
		glauconitic throughout, micas common (biotite, muscovite and phlogopite)

Chain Lakes Property

Drill Hole: 97-2

Depth	Rock	Descriptive Comments
From	Type	
		197' - 200': finely interlaminated bentonitic silts and muds
		200' - 202': sandstone and mudstone 'clasts' abundant at all angles
		202' - 205': bentonitic ss with interlaminated green clays
		205' - 210': mudstone 'clasts' in bentonitic sands
210.0	Mudstone	dark grey, finely laminated, bentonitic; occas thin silty laminae or thin beds
		237': bedding to c/a = 48°
242.5	?	very poor core recovery; core will not lock into core barrel; GOTO conventional
		drilling: **cuttings retained but not logged**
677.0	Mudstone	interbedded and interlaminated clayey siltstone and dark grey mudstone; soft
		sediment deformation textures common; channel scouring common; graded
		bedding rythmically repeated; strong bioturbation
		677': bedding to c/a = 65°
		684': bedding to c/a = 66°
		686' - 687': fossil worm burrows; no indicator minerals panned
		692' - 693': dense shale with mud cracks; no indicator minerals panned
		709': bedding to c/a = 65°
		723': panned abundant marcasite spherules (worm castings), minor glauconite,
		carbonate and some magnetite.
		723': bedding to c/a = 62°

Appendix VI

Assay Data

A - LORING LABS: 95-1 DRILL CUTTINGS

B - LORING LABS: 95-1 GRAINS PICKED FROM CORE

C - LORING LABS: HAND SAMPLES: #001, #002, #003; BULK DENSITY

D - LORING LABS: SURFACE SAMPLE 10001, 97-1 DRILL CUTTINGS, 97-2: A and B DRILL CUTTINGS, 97-2 CORE

E - M. GLATIOTIS; SEM/KEVEX ANALYSES

F - ASHTON MINING: HAND SPECIMEN WHOLE ROCK ANALYSES

G - DR. NASSICHUK: X-RAY DIFFRACTOGRAM OF CORE FROM 314’, 95-1

A - LORING LABS 95-1 DRILL CUTTINGS

Loring Laboratories Ltd.
629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

Date: November 28, 1995
File: 37822-D
Client : DR. TED YOSHIDA

REVISED SUMMARY OF POTENTIAL INDICATORS PICKED

Sample	Garnet	Clinopyroxene	Ilmenite	Chromite	Olivine	Diamond	Total Grains
2	1	3	0	0	0	0	4
Totals	**1**	**3**	**0**	**0**	**0**	**0**	**4**

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

FILE # : 37822-D COMPANY: DR. TED YOSHIDA DATE : Nov 28, 1995

SAMPLE ID.	ORIGINAL WEIGHT	SCREEN ANALYSIS				TABLE CONC.	MIDDLINGS 2.9 - 3.3 SG		HEAVIES >3.3 SG							
									MAG.	+28	P.M.			W.P.M.		N.M.
	(Kg)	+6 mesh (kg)	+35 mesh (kg)	35 x 80 mesh (kg)	-80 mesh (Kg)	+80 mesh (g)	MAG. (g)	NON - MAG. (g)	(g)	Mesh (g)	0.5 (g)	0.6 (g)	0.7 (g)	1.2 (g)	2.0 (g)	2.0 (g)
2	19.6	0.7	2.0	6.5	10.5	763	0.06	36.26	0.31	9.18	15.58	3.30	0.38	1.65	0.28	1.98

NOTE : P.M. = PARAMAGNETIC W.P.M. = WEAKLY PARAMAGNETIC N.M. = NON-MAGNETIC

[redacted]

ASSAYER

Loring Laboratories Ltd.
629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

Date: November 28, 1995
File: 37822-D
Client : DR. TED YOSHIDA

REVISED SUMMARY OF POTENTIAL INDICATORS PICKED

Sample	Garnet	Clinopyroxene	Ilmenite	Chromite	Olivine	Diamond	Total Grains
1	2	2	0	0	0	0	4
Totals	**2**	**2**	**0**	**0**	**0**	**0**	**4**

NOTE: There are a lot more Clinopyroxene, only picked two to represent.

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

FILE # : 37796-D

COMPANY: DR. TED YOSHIDA

DATE : Nov 28, 1995

SAMPLE ID.	ORIGINAL WEIGHT	SCREEN ANALYSIS				TABLE CONC.	MIDDLINGS 2.9 - 3.3 SG		HEAVIES >3.3 SG							
									MAG.	+28	P.M.			W.P.M.		N.M.
	(Kg)	+6 mesh (kg)	+35 mesh (kg)	35 x 80 mesh (kg)	-80 mesh (Kg)	+80 mesh (g)	MAG. (g)	NON - MAG. (g)	(g)	Mesh (g)	0.5 (g)	0.6 (g)	0.7 (g)	1.2 (g)	2.0 (g)	2.0 (g)
1	37.6	2.6	5.4	13.5	16.1	725	0.68	62.97	3.81	1.32	12.67	2.35	0.67	0.95	0.16	0.87

NOTE : P.M. = PARAMAGNETIC W.P.M. = WEAKLY PARAMAGNETIC N.M. = NON-MAGNETIC

[redacted]

ASSAYER

Loring Laboratories Ltd.
629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

File No. 37822-1-D
Client: Dr. Ted Yoshida Microprobe Data Dec 31, 1995

	Location			Data in wt %											
Sample#	P#	C#	R#	SiO2	TiO2	Al2O3	Cr2O3	FeO	MgO	CaO	Na2O	MnO	K2O	Total	Mineral
#1	102	B	1	0.01	0.03	69.45	0.05	4.89	26.48	0.03	0.01	0.13	0.00	101.08	spinel
#1	102	C	1	30.34	38.48	0.66	0.00	0.84	0.00	28.55	0.01	0.11	0.00	98.99	sphene
#1	102	F	1	38.20	0.18	20.70	0.00	1.60	0.05	36.98	0.00	0.32	0.00	98.03	garnet
#1	102	G	1	38.79	0.09	21.00	0.02	2.93	0.04	36.00	0.00	0.16	0.00	99.03	garnet
#2	102	H	1	37.05	0.08	20.84	0.06	35.39	4.07	2.19	0.00	0.40	0.00	100.08	garnet
#2	102	A	2	53.30	0.13	1.47	0.00	7.05	13.99	23.89	0.36	0.46	0.00	100.65	pyroxene
#2	102	B	2	53.48	0.04	1.38	0.18	7.64	14.36	22.47	0.46	0.29	0.00	100.30	pyroxene
#2	102	C	2	53.84	0.09	1.00	0.33	4.03	17.50	23.08	0.20	0.09	0.00	100.16	pyroxene

Note: First 4 grains from sample #1 submitted by R. Haimila

Loring Laboratories Ltd.

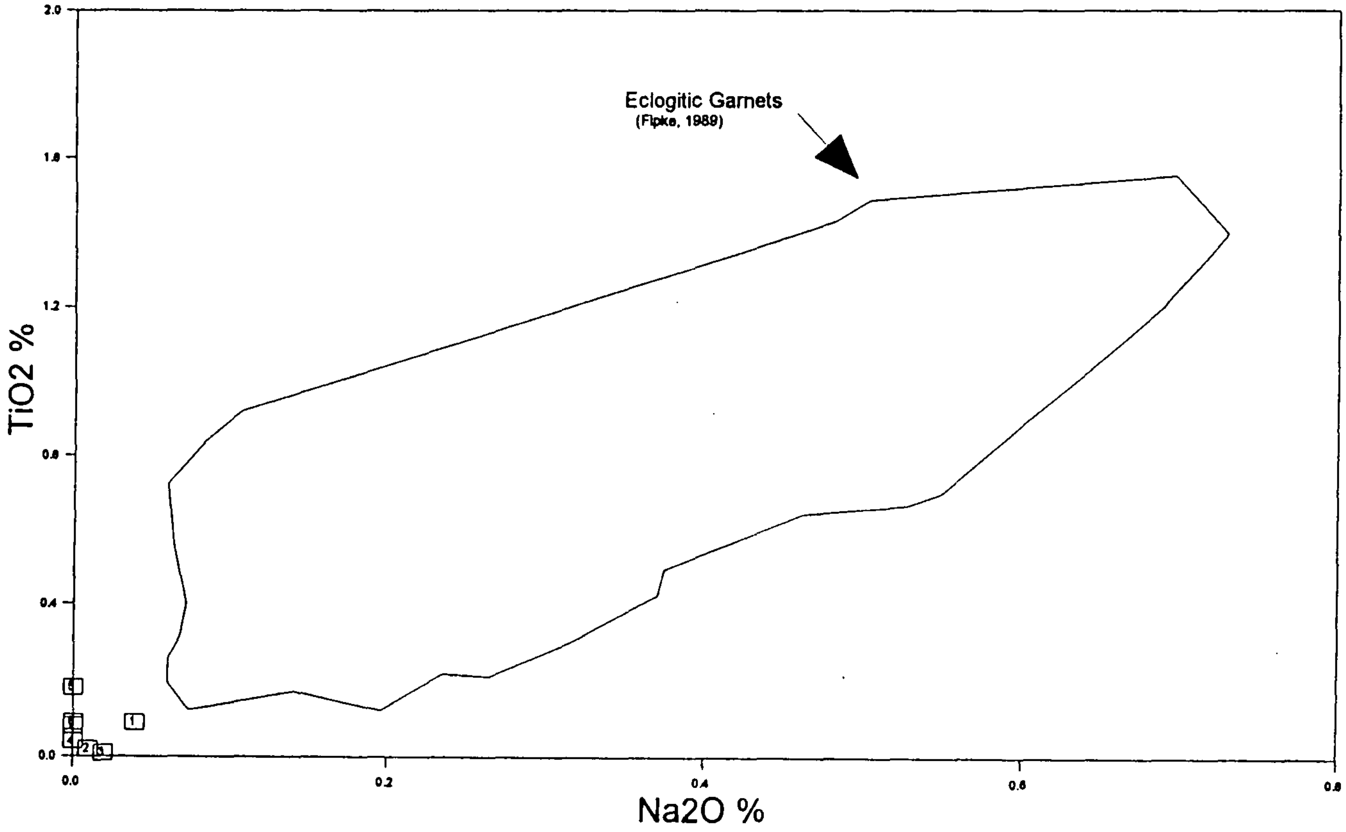
629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

File No. : 37796-1-D, 37822-1-D
Client: Dr. Ted Yoshida

Garnet Classification (after Dawson and Stephens, 1975)

		Location			Data in wt %						Garnets Classification											
Grain #	Sample #	P#	C#	R#	TiO2	Cr2O3	FeO	MgO	CaO	Na2O	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
1	#1	103	D	1	0.09	0.00	27.47	3.92	9.35	0.04	..	..	..	..	5	..	..	..	..	..	..	..
2	#1	103	E	1	0.02	0.00	37.94	2.98	0.65	0.01	..	..	..	..	5	..	..	..	..	..	..	..
3	#1	103	H	1	0.01	0.03	36.54	4.20	0.68	0.02	..	..	..	..	5	..	..	..	..	..	..	..
4	#1	103	I	1	0.04	0.14	36.59	3.75	0.81	0.00	..	..	..	..	5	..	..	..	..	..	..	..
5	#1	102	F	1	0.18	0.00	1.60	0.05	36.98	0.00	..	..	..	..	..	..	..	8	..	..	..	..
6	#1	102	G	1	0.09	0.02	2.93	0.04	36.00	0.00	..	..	..	..	..	..	..	8	..	..	..	..
7	#2	102	H	1	0.08	0.06	35.39	4.07	2.19	0.00	..	..	..	..	5	..	..	..	..	..	..	..
										7	0	0	0	0	5	0	0	2	0	0	0	0
											G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12

Eclogite Garnet Indicators



Loring Laboratories Ltd.
629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

File #: 37796-1-D, 37822-1-D
Client: Dr. Ted Yoshida

Pyroxene Classification (after Stephens and Dawson, 1977)

												ORTHOPYROXENE					CLINOPYROXENE									
	Location				Data in wt %																					
G #	Sample #	P#	C#	R#	TiO2	Al2O3	Cr2O3	FeO	MgO	CaO	Na2O	1	2	3	4	5	1	2	3	4	5	6	7	8	9	10
1	#1	103	F	1	0.11	2.29	0.08	6.38	14.38	22.85	1.04							2								
2	#1	103	G	1	0.02	1.08	0.13	6.11	14.82	22.96	0.87							2								
3	#1	103	J	1	0.05	1.45	0.04	7.01	13.68	7.67	0.97													8		
4	#2	102	A	2	0.13	1.47	0.00	7.05	13.99	23.89	0.36							2								
5	#2	102	B	2	0.04	1.38	0.18	7.64	14.36	22.47	0.46							2								
6	#2	102	C	2	0.09	1.00	0.33	4.03	17.50	23.08	0.20							2								

		ORTHOPYROXENE					CLINOPYROXENE									
		1	2	3	4	5	1	2	3	4	5	6	7	8	9	10
Total Pyroxene =	6	0	0	0	0	0	0	5	0	0	0	0	0	1	0	0

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

File No. 37796-1-D
Client: Dr. Ted Yoshida

Microprobe Data

Dec 31, 1995

Location				Data in wt %											
Sample#	P#	C#	R#	SiO2	TiO2	Al2O3	Cr2O3	FeO	MgO	CaO	Na2O	MnO	K2O	Total	Mineral
#1	103	B	1	0.01	0.15	98.12	0.08	0.83	0.00	0.00	0.00	0.04	0.00	99.23	corundum
#1	103	D	1	37.82	0.09	20.59	0.00	27.47	3.92	9.35	0.04	1.52	0.00	100.80	garnet
#1	103	E	1	36.54	0.02	20.70	0.00	37.94	2.98	0.65	0.01	1.64	0.00	100.48	garnet
#1	103	F	1	52.57	0.11	2.29	0.08	6.38	14.38	22.85	1.04	0.34	0.02	100.06	pyroxene
#1	103	G	1	53.53	0.02	1.08	0.13	6.11	14.82	22.96	0.87	0.18	0.01	99.71	pyroxene
#1	103	H	1	37.11	0.01	21.03	0.03	36.54	4.20	0.68	0.02	1.12	0.00	100.74	garnet
#1	103	I	1	36.84	0.04	21.00	0.14	36.59	3.75	0.81	0.00	1.34	0.00	100.51	garnet
#1	103	J	1	53.13	0.05	1.45	0.04	7.01	13.68	7.67	0.97	0.27	0.01	84.28	pyroxene *

* EDS indicate diopside, edge interference on Ca-Ti

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

O: DR. TED YOSHIDA
ILE # 37796-1-D

DATE: December 5, 1995

lement	AU	AG	AS	BA	BR	CA	CO	CR	CS	FE	HF	HG	IR	MO	NA	NI	RB	SB	SC	SE	SN	SR	TA	TH	U	W	ZN
nits	PPB	PPM	PPM	PPM	PPM	%	PPM	PPM	PPM	%	PPM	PPM	PPB	PPM	PPM	PPM	PPM	PPM	PPM	PPM	%	%	PPM	PPM	PPM	PPM	PPM
37796	-5	-5	8	810	-1	2	8	110	1.8	1.75	3.6	-1	-5	-5	14600	-50	32	0.7	5.1	-3	-0.01	0	-1	5.1	2	-3	130

lement	LA	CE	ND	SM	EU	TB	YB	LU
nits	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM
37796	20	37	17	3.2	0.8	0.6	1.4	0.22

□□□□□□□□□□□

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel 274-2777 Fax: 275-0541

File No. : 38373
Client: R.Haimila
Microprobe Data

Date: July 19, 1996

		Location			Data in wt %										
Grain	Sample#	P#	C#	R#	TiO2	Al2O3	Cr2O3	V2O3	FeO	MnO	MgO	NiO	ZnO	Total	Mineral
2	0.7	111	A	1	0.03	18.71	50.64	0.19	17.60	0.34	12.03	0.04	0.22	99.79	Chromite
2	0.7	111	B	1	15.19	0.10	0.14	0.25	76.69	0.12	0.06	0.00	0.03	92.59	Ti-magnetile
2	0.7	111	C	1	60.04	0.11	0.04	0.38	31.97	0.22	0.02	0.00	0.04	92.83	altered tFi-Fe oxide
3	1.2	111	A	1	0.04	2.84	0.01	0.02	64.39	3.18	0.58	0.00	0.06	71.11	altered Fe oxide/hydroxide
3	1.2	111	B	1	99.42	0.03	0.19	0.69	0.27	0.01	0.00	0.02	0.01	100.63	rutile
3	1.2	111	C	1	53.50	0.00	0.00	0.25	44.89	2.18	0.03	0.00	0.02	100.87	ilmerile
3	1.2	111	D	1	0.48	9.64	47.64	0.06	32.98	0.65	7.58	0.09	0.23	99.35	Chromite
3	1.2	111	E	1	89.34	0.32	0.23	1.47	1.78	0.00	0.00	0.02	0.02	93.17	rutile
4	2.0	111	A	1	99.31	0.05	0.11	0.89	0.13	0.00	0.00	0.01	0.02	100.52	rutile
4	2.0	111	B	1	2.37	12.79	0.00	0.00	15.72	0.32	0.75	0.00	0.07	32.02	allanite
4	2.0	111	C	1	72.79	2.71	0.17	0.66	14.24	0.17	0.07	0.00	0.04	90.83	altered Ti-Fe oxide

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

No. : 38373
nt: R.Haimila
icroprobe Data

		Location			Data in wt %											
rain	Sample#	P#	C#	R#	SiO_2	TiO_2	Al_2O_3	Cr_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	Total	Mineral
1	Li LAC	111	B	1	32.62	0.01	0.00	0.02	0.00	0.04	0.00	0.04	0.00	0.00	32.7	zircon
2	Li LAC	111	C	1	32.67	0.04	0.00	0.02	0.00	0.06	0.01	0.06	0.03	0.00	32.9	zircon
3	Li LAC	111	D	1	31.96	0.04	0.02	0.00	0.00	0.00	0.02	0.02	0.03	0.00	32.1	zircon
4	[illegible]ange	111	E	1	29.15	36.70	1.37	0.00	1.43	0.10	0.02	26.91	0.01	0.00	95.7	sphene
5	Orange	111	F	1	29.39	36.32	1.70	0.00	1.42	0.14	0.01	27.99	0.04	0.00	97	sphene
6	Pale Copper	111	G	1	37.22	0.11	20.90	0.04	27.31	2.89	1.74	8.98	0.01	0.00	99.2	unknown

B - LORING LABS 95-1 GRAINS PICKED FROM CORE

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

le No 37917 24-Jan-96

Client: R. Haimila

Microprobe Data

		Location			Data in wt %											
Grain#	Sample	Plug	C#	R#	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	Total	Mineral
1	1	106	A	2	27.85	0.76	52.41	0.10	12.47	0.02	2.10	0.00	0.01	0.00	95.72	Staurolite
2	2	106	B	2	27.90	0.66	53.70	0.00	13.07	0.20	1.93	0.00	0.00	0.00	97.46	Staurolite
3	3	106	C	2	28.43	0.75	52.88	0.00	12.91	0.07	2.11	0.00	0.00	0.01	97.16	Staurolite
4	4	106	D	2	29.66	36.79	1.25	0.00	1.14	0.18	0.01	27.53	0.00	0.00	96.56	Titanite
5	5	106	E	2	36.99	0.19	20.40	0.00	29.63	0.43	1.26	10.55	0.01	0.01	99.47	Garnet
6	6	106	F	2	40.74	0.34	22.12	0.20	13.28	0.43	18.40	4.04	0.04	0.00	99.59	Garnet
7	7	106	G	2	38.25	0.00	21.48	0.00	26.56	2.25	8.32	2.79	0.01	0.00	99.66	Garnet
8	8	106	H	2			SAMPLE TOO SMALL									
9	9	106	I	2	37.88	0.33	20.36	0.04	3.26	0.29	0.12	34.74	0.01	0.01	97.04	Garnet
10	10	106	J	2	59.99	0.10	25.15	0.00	0.17	0.00	0.00	7.41	7.11	0.30	100.23	Unknown

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

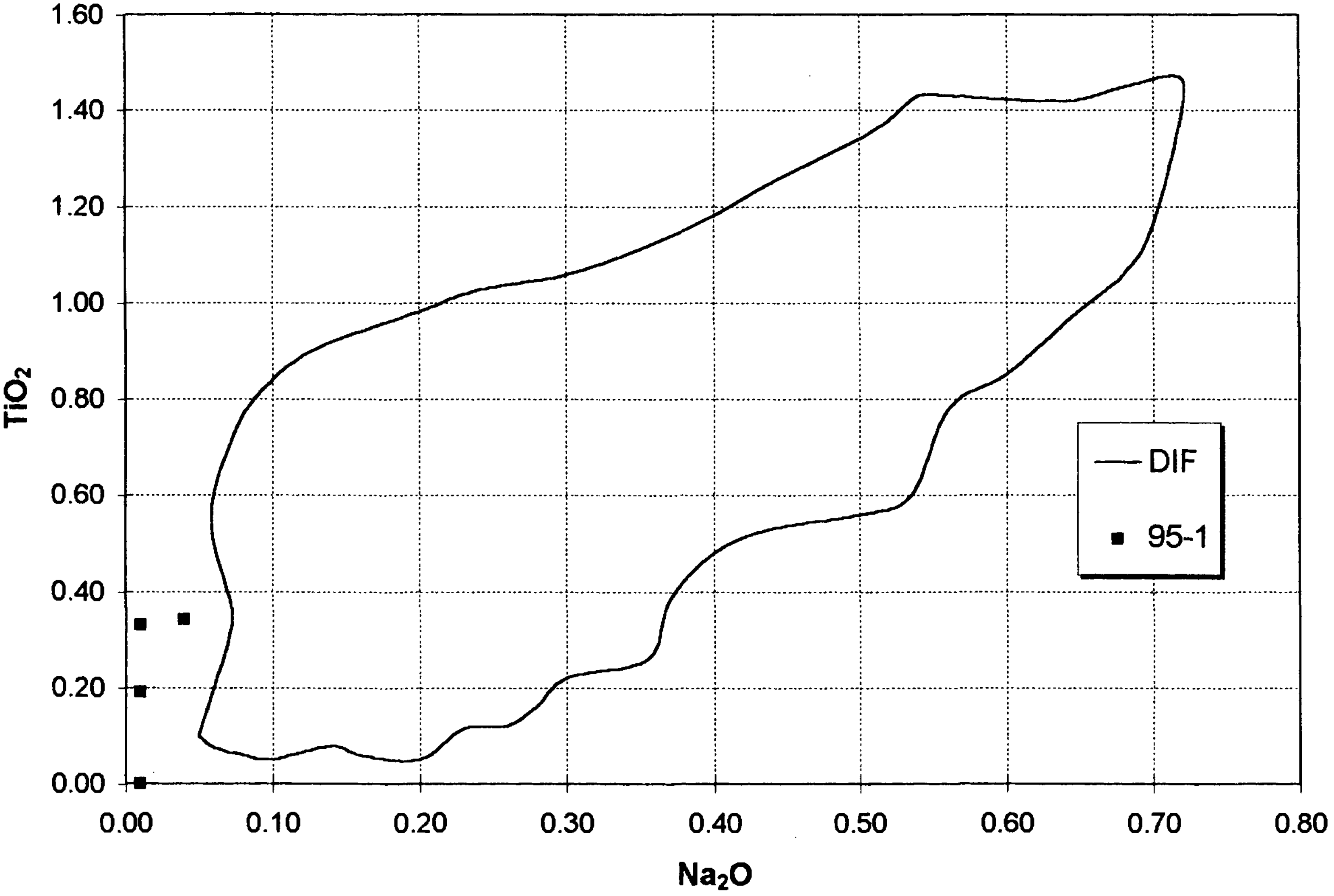
File No. : 38917-1-D
Client: TUL Petroleum

Date: Sept 30, 1996

Garnet Classification (after Dawson and Stephens, 1975)

		Location			Data in wt %						Garnets Classification											
Grain #	Sample #	P#	C#	R#	TiO2	Cr2O3	FeO	MgO	CaO	Na2O	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
5	5	106	E	2	0.19	0.00	29.63	1.26	10.55	0.01	. .	. .	. .	. .	5	. .	. .	. .	. .	. .	. .	. .
6	6	106	F	2	0.34	0.20	13.28	18.40	4.04	0.04	. .	. .	3	. .	. .	. .	. .	. .	. .	. .	. .	. .
7	7	106	G	2	0.00	0.00	26.56	8.32	2.79	0.01	. .	. .	. .	. .	5	. .	. .	. .	. .	. .	. .	. .
9	9	106	I	2	0.33	0.04	3.26	0.12	34.74	0.01	. .	. .	. .	. .	. .	. .	. .	8	. .	. .	. .	. .
											—	—	—	—	—	—	—	—	—	—	—	—
										4	0	0	1	0	2	0	0	1	0	0	0	0
											G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12

ECLOGITIC GARNETS
from Drill Hole 95-1 Cuttings



Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

File No. : 37978-D
Client : RAYMOND HAIMILA
Microprobe Data

		Location			Data in wt %													
Grain	Sample	Plug	C#	R#	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	NiO	ZnO	Total	Mineral
1	1	107	A	5	98.24	0.04	0.00	0.00	0.00	0.01	0.00	0.04	0.00	0.00	--	--	98.33	QUARTZ
2	2	107	B	5	96.84	0.10	0.00	0.02	0.00	0.00	0.03	0.00	0.00	0.00	--	--	96.99	QUARTZ
3	3	107	C	5	98.02	0.08	0.02	0.03	0.02	0.00	0.03	0.02	0.00	0.00	--	--	98.22	QUARTZ
4	4	107	D	5	0.22	0.00	0.00	0.00	0.03	0.00	0.00	20.24	0.00	0.00	--	--	20.49	SCHEELITE *
5	5	107	E	5	37.30	0.10	20.42	0.02	33.09	0.65	1.81	7.17	0.00	0.00	--	--	100.56	GARNET

NOTE: EDS indicate W

Garnet : G5 eclogite

C - LORING LABS HAND SAMPLES: #001, #002, #003; BULK DENSITY

To : **Andy Glatiotis**
5643 Brenner Cr. NW
Calgary, Alberta
T2L 1Z3
ATTN : Andy Glatiotis

File No : **39378**
Date : 7-Aug-97
Samples :
Project :
P.O.#

Certificate of Assay
Loring Laboratories Ltd.

Sample No.	Bulk Density
"Bulk Density Analyses"	
CL-97- 1	3.46
CL-97- 2	3.64
CL-97- 3	3.05

I HEREBY CERTIFY that the above results are those assays made by me upon the herein described samples :

[redacted]
Assayer

Rejects and pulps are retained for one month unless specific arrangements are made in advance.

D - LORING LABS SURFACE SAMPLE 10001, 97-1 DRILL CUTTINGS, 97-2: A AND B DRILL CUTTINGS, 97-2 CORE

629 Beaverdam Rd. N.E.
Calgary, Alberta T2K 4W7

LORING LABORATORIES LTD.

E-mail: loringll@cadvision.com

Tel: (403) 274-2777
Fax: (403) 275-0541

To: Mr. Andy Glatiotis

From: LORING LABORATORIES LTD.

Date: October 7, 1997

Subject: Sample Results

File: 39382,39216,39353

1. Introduction

Enclosed are the results of the processing of your samples 10001, 97-2, 97-2 A, 97-2 B, 97-1 Cutting.

The data sheets enclosed represent the adjusted microprobe data as received from the technician. On the tables and charts attached to this report, the oxides are presented in weight percent of the composition of the mineral and -- indicates that the oxide was not analyzed in the mineral (see Microprobe Data table)

Each grain was designated a number which can be found in the leftmost column of the microprobe data sheet. All numbers plotted on any charts refer to these numbers.

Care must be taken in interpreting this data. Although some of these minerals may be found in kimberlite or lamproite, they may also be present in other rocks.

Following are a few notes on the mineral grains picked from the samples.

2. Garnet

The garnets have been categorized according to Dawson and Stephens' (1975) classification. Of the 17 grains selected for probing, 11 rank as G5(Magnesian Almandine), 5 rank as G7(Fe-Mg Uvarovite), 1 rank as G11(Titanian Uvarovite-Pyrope). (see Garnet Classification tables).

None of the Grain plotted in the Eclogitic Field from Fipke.(1989) (see Eclogite Garnet Indicators chart).

3.Pyroxene

Eight grains were identified as pyroxene. Two of these grains classify as CP-2 (Diopside), six classifies as CP-4 (Low Chrome Diopside). None of the grain plots in the diamond inclusion field (Fipke 1989)(see chart)

4.Ilmenite

Four grains were identified as Ilmenite, neither of these grains fall in the diamond inclusion field(Fipke, 1989).

5.Other Minerals

Six grains from these samples had low totals of weight percent since not all oxides were probed for. Four are probable Zn-spinel, two are probable apatite. Also eight grains are probable Tourmaline, five are probable staurolite, three spinel and one epidote.

6.References

Dawson J.B. and W.E. Stephens
1975: Statistical Classification of Garnets from Kimberlite and Associated Xenoliths. Journal of Geology, vol. 83, p. 589-607.

Fipke, C. E. (ed.)
1989: The development of advanced technology to distinguish between diamondiferous and barren diatremes. Geol. Surv. of Canada, Open File Report 2124.

Gurney, J. J.
1985: A correlation between garnets and diamonds in Kimberlites; in J.E. Glover and P.G. Harris (eds.), Kimberlite Occurrence and Origin: A basis for conceptual models in exploration, Geol. Dept. and Univ. Exten., Univ. W. Aust., Publ. No. 8, 143-166.

Stephens W.E. and J.B. Dawson
1977: Statistical Comparison Between Pyroxenes from Kimberlites and their Associated Xenoliths. Journal of Geology, vol. 85, p. 433-449.

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

File No. : 39382,39216,39353

Date: October 7, 1997

Client : Andy Glatiotis

Microprobe Data

		Location		Data in wt %											
Grain	Sample	Plug	C#	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	Total	Mineral
1	97-1 Cutting	124	1B	0.18	0.11	0.20	0.01	2.35	0.35	0.14	45.30	0.11	0.00	48.74	apatite?
2	97-1 Cutting	124	1C	0.00	0.06	0.19	0.00	1.69	0.09	0.15	45.44	0.27	0.00	47.90	apatite?
3	97-2 A	124	1G	36.04	0.12	20.09	0.00	32.95	0.77	1.30	7.25	0.00	0.00	98.52	garnet
4	97-2 A	124	1H	36.86	0.00	20.40	0.01	31.89	0.75	2.57	6.95	0.00	0.00	99.42	garnet
5	97-2 A	124	1I	36.61	0.06	20.55	0.01	30.24	2.54	2.16	7.32	0.02	0.02	99.52	garnet
6	97-2 B	124	1J	36.71	0.08	20.01	0.00	29.50	2.60	2.13	6.99	0.01	0.00	98.03	garnet
7	97-2 B	124	2A	35.95	0.00	20.75	0.03	33.48	3.61	2.43	2.81	0.00	0.00	99.06	garnet
8	97-2 B	124	2B	36.46	0.02	20.14	0.08	31.78	1.39	2.46	6.58	0.00	0.01	98.92	garnet
9	10001	124	2C	37.41	0.00	21.20	0.00	29.90	0.26	7.85	2.55	0.00	0.00	99.17	garnet
10	10001	124	2D	36.34	0.00	20.91	0.00	36.18	1.17	3.91	0.97	0.03	0.00	99.51	garnet
11	10001	124	2E	35.79	0.04	20.53	0.00	36.26	2.88	1.24	2.35	0.00	0.00	99.10	garnet
12	10001	124	2F	36.35	0.08	20.69	0.00	33.80	0.39	3.06	4.31	0.00	0.00	98.67	garnet
13	10001	124	2G	35.23	0.01	19.85	0.00	25.72	16.04	0.36	0.52	0.06	0.00	97.78	garnet
14	97-1 Cutting	124	3A	26.86	0.64	52.01	0.04	12.68	0.07	2.35	0.00	0.00	0.00	94.65	staurolite
15	97-1 Cutting	124	3B	26.70	0.77	51.78	0.03	13.14	0.08	2.28	0.00	0.00	0.01	94.79	staurolite
16	97-1 Cutting	124	3C	26.84	0.71	51.71	0.03	12.96	0.04	2.13	0.00	0.01	0.00	94.42	staurolite
17	97-1 Cutting	124	3D	26.58	0.63	51.78	0.03	12.74	0.05	2.17	0.00	0.00	0.00	93.97	staurolite
18	97-1 Cutting	124	3E	25.94	0.69	52.16	0.06	12.74	0.00	1.83	0.00	0.00	0.00	93.42	staurolite
19	97-1 Cutting	124	4A	35.66	0.17	0.07	9.69	18.35	0.05	0.08	34.24	0.00	0.01	98.33	garnet
20	97-1 Cutting	124	4B	37.72	0.63	15.26	6.50	4.29	1.32	0.23	32.73	0.04	0.00	98.72	garnet
21	97-1 Cutting	124	4C	37.30	1.25	11.43	11.29	1.95	0.94	0.16	34.60	0.00	0.00	98.93	garnet
22	97-1 Cutting	124	4D	37.01	0.19	9.01	15.17	1.60	1.09	0.27	33.67	0.00	0.01	98.01	garnet
23	97-1 Cutting	124	4E	36.67	0.65	9.48	11.53	0.25	0.07	0.25	35.56	0.00	0.01	94.46	garnet?
24	97-2 A	124	4F	35.91	0.13	0.06	10.08	17.91	0.02	0.05	33.87	0.04	0.00	98.07	garnet
25	97-2 A	124	4G	52.45	0.04	1.58	0.09	7.47	0.23	14.18	22.65	0.65	0.00	99.34	pyroxene
26	97-2 A	124	4H	52.47	0.11	1.32	0.05	8.09	0.28	13.24	23.68	0.72	0.00	99.97	pyroxene
27	97-2 A	124	4I	52.55	0.20	1.36	0.07	8.73	0.45	13.45	22.63	0.63	0.00	100.06	pyroxene
28	97-2 A	124	4J	51.60	0.11	1.51	0.02	9.73	0.51	12.09	23.42	0.51	0.01	99.51	pyroxene
29	97-2 A	124	5A	52.71	0.11	1.07	0.00	9.77	0.87	12.78	22.33	0.77	0.00	100.40	pyroxene
30	97-2 A	124	5B	53.80	0.12	0.81	0.00	7.07	0.08	14.18	22.85	1.33	0.01	100.23	pyroxene
31	97-2 B	124	5C	52.08	0.13	1.51	0.01	8.34	0.48	13.81	21.89	0.81	0.00	99.07	pyroxene
32	97-2 B	124	5D	0.00	0.00	51.42	0.02	14.98	0.14	2.54	0.00	0.00	0.00	69.09	Zn-spinel
33	10001	124	5E	0.00	0.00	49.70	0.01	11.81	0.15	2.46	0.01	0.00	0.00	64.14	Zn-spinel
34	10001	124	5F	0.00	0.02	42.62	0.00	4.63	0.41	0.02	0.00	0.00	0.00	47.70	Zn-spinel
35	10001	124	5G	0.00	0.05	44.42	0.00	6.58	0.22	0.59	0.04	0.00	0.01	51.92	Zn-spinel
36	10001	124	5H	36.11	0.03	22.82	0.04	7.79	0.13	1.02	22.46	0.03	0.06	90.47	epidote
37	97-1 Cutting	124	6A	34.71	0.64	33.57	0.02	12.75	0.11	1.62	0.26	2.05	0.07	85.80	tourmaline
38	97-1 Cutting	124	6B	35.20	0.99	33.35	0.00	9.43	0.02	4.27	0.62	1.84	0.05	85.77	tourmaline
39	97-1 Cutting	124	6C	35.73	0.60	33.99	0.00	7.46	0.09	4.78	0.48	1.82	0.03	84.98	tourmaline
40	97-1 Cutting	124	6D	35.71	0.88	33.70	0.00	10.27	0.05	3.68	0.23	2.21	0.03	86.75	tourmaline
41	97-1 Cutting	124	6E	35.22	1.00	32.96	0.00	8.73	0.07	4.88	0.80	1.85	0.05	85.56	tourmaline
42	97-2	124	6G	51.70	0.35	4.41	0.11	16.71	0.29	25.21	1.16	0.09	0.00	100.02	pyroxene
43	97-2	124	6J	35.98	0.30	31.04	0.07	6.50	0.09	8.26	1.15	2.24	0.09	85.71	tourmaline
44	10001	124	7A	34.58	0.87	33.32	0.00	10.45	0.02	3.66	0.33	2.15	0.07	85.45	tourmaline

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

File No. : 39382,39216,39353

Date: October 7, 1997

Client : Andy Glatiotis

Microprobe Data

		Location		Data in wt %											
Grain	Sample	Plug	C#	SiO2	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Na2O	K2O	Total	Mineral
45	10001	124	7B	35.31	0.48	29.39	0.00	2.67	0.05	12.17	4.87	0.46	0.00	85.41	tourmaline
46	97-2	124	6F	0.07	0.70	58.81	0.06	21.33	0.09	18.18	0.02	--	--	99.24	spinel
47	97-2	124	6H	0.05	0.99	55.61	0.10	24.93	0.16	17.24	0.00	--	--	99.08	spinel
48	97-2	124	6I	0.09	1.37	53.93	0.06	27.03	0.10	16.44	0.00	--	--	99.01	spinel
49	10001	124	7C	0.01	53.21	0.02	0.07	45.55	0.57	0.58	0.00	--	--	100.00	ilmenite
50	10001	124	7D	0.02	51.55	0.03	0.02	45.98	2.09	0.20	0.00	--	--	99.88	ilmenite
51	10001	124	7E	0.01	50.11	0.02	0.00	47.97	1.73	0.30	0.00	--	--	100.14	ilmenite
52	10001	124	7F	0.00	49.54	0.10	0.06	47.64	1.02	1.51	0.00	--	--	99.88	ilmenite

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

File No. : 39382,39216,39353

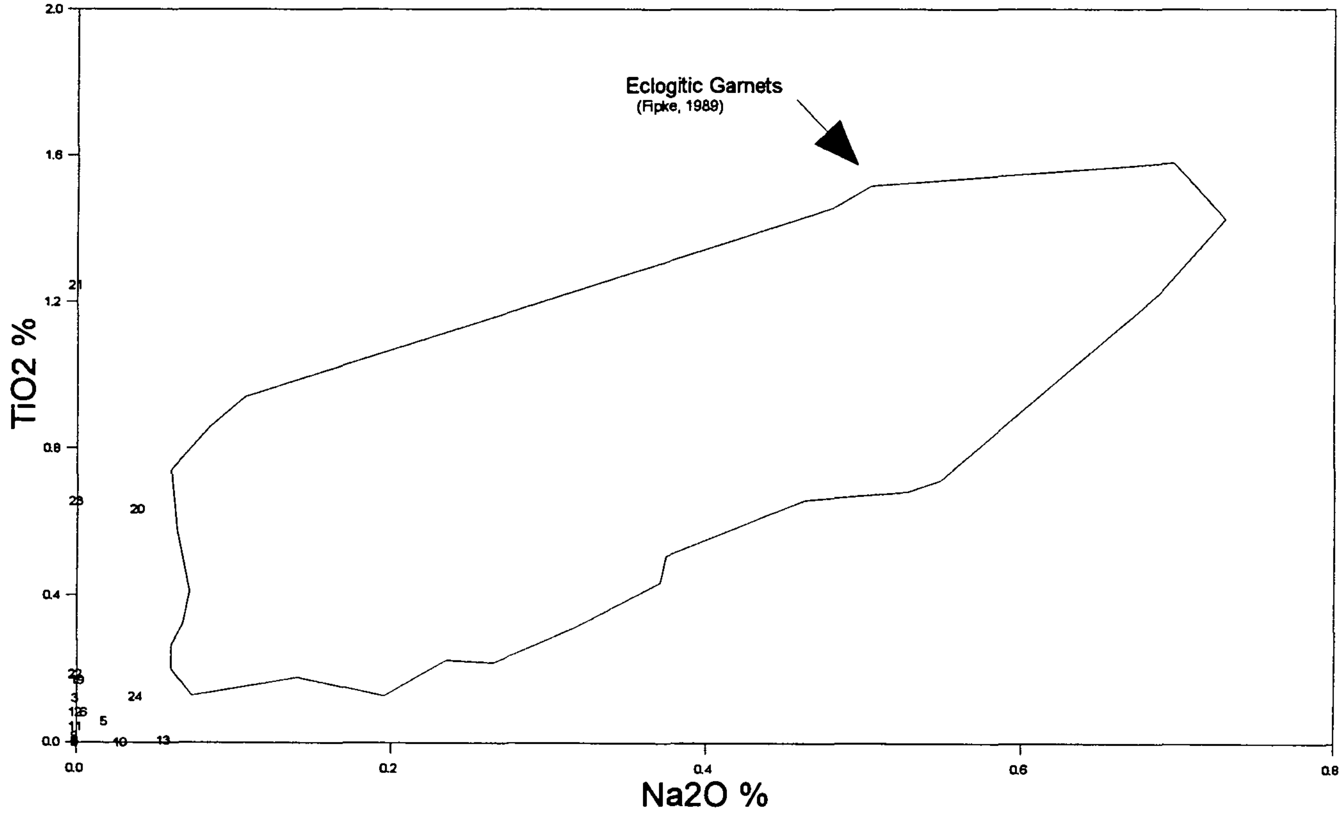
Date: Oct 07, 1997

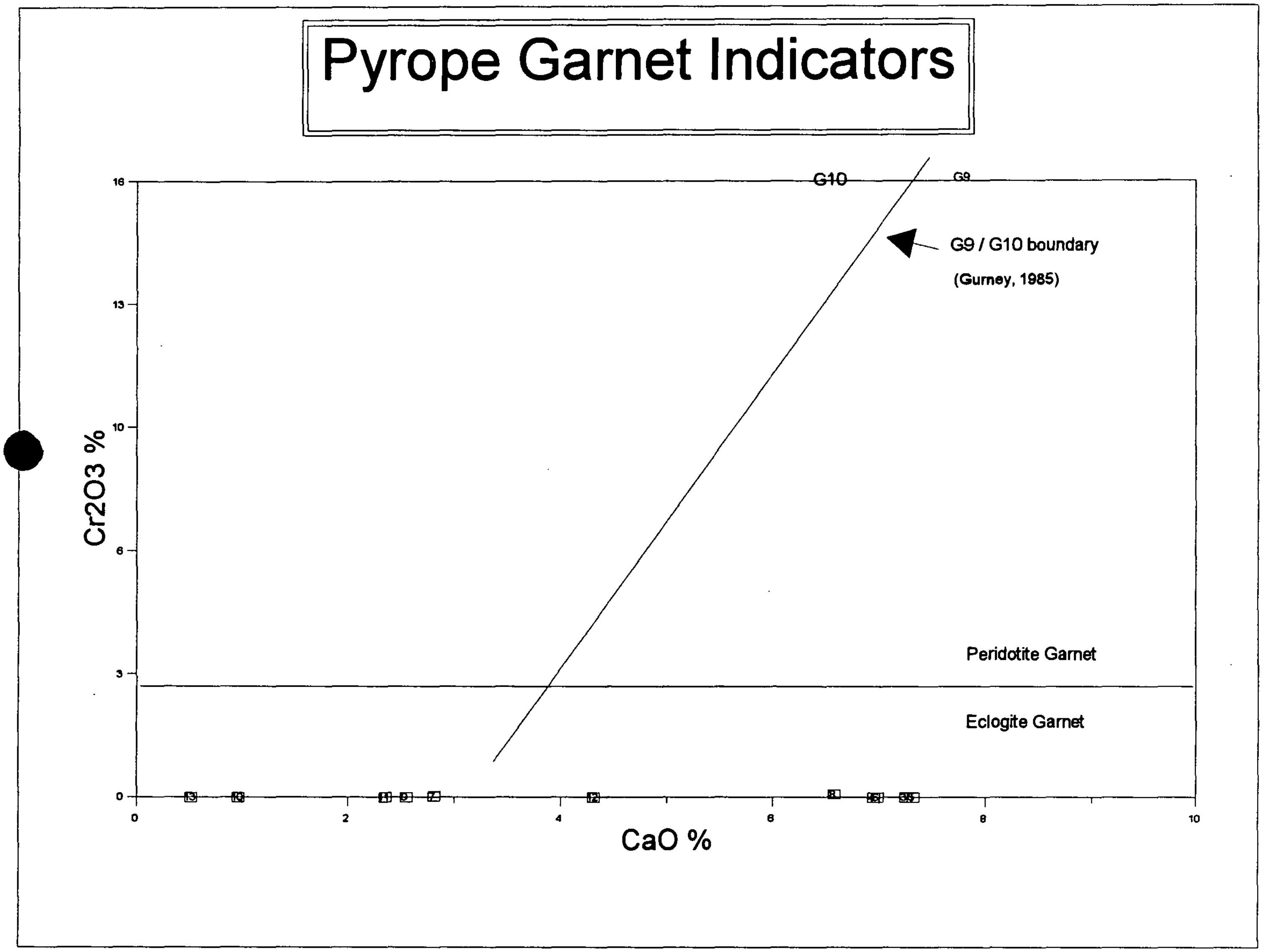
Client: Andy Glatiotis

Garnet Classification (after Dawson and Stephens, 1975)

		Location		Data in wt %						Garnets Classification											
Grain #	Sample #	P#	C#	TiO2	Cr2O3	FeO	MgO	CaO	Na2O	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
3	97-2 A	124	1G	0.12	0.00	32.95	1.30	7.25	0.00	. .	. .	. .	. .	5	. .	. .	. .	. .	. .	. .	. .
4	97-2 A	124	1H	0.00	0.01	31.89	2.57	6.95	0.00	. .	. .	. .	. .	5	. .	. .	. .	. .	. .	. .	. .
5	97-2 A	124	1I	0.06	0.01	30.24	2.16	7.32	0.02	. .	. .	. .	. .	5	. .	. .	. .	. .	. .	. .	. .
6	97-2 B	124	1J	0.08	0.00	29.50	2.13	6.99	0.01	. .	. .	. .	. .	5	. .	. .	. .	. .	. .	. .	. .
7	97-2 B	124	2A	0.00	0.03	33.48	2.43	2.81	0.00	. .	. .	. .	. .	5	. .	. .	. .	. .	. .	. .	. .
8	97-2 B	124	2B	0.02	0.08	31.78	2.46	6.58	0.00	. .	. .	. .	. .	5	. .	. .	. .	. .	. .	. .	. .
9	10001	124	2C	0.00	0.00	29.90	7.85	2.55	0.00	. .	. .	. .	. .	5	. .	. .	. .	. .	. .	. .	. .
10	10001	124	2D	0.00	0.00	36.18	3.91	0.97	0.03	. .	. .	. .	. .	5	. .	. .	. .	. .	. .	. .	. .
11	10001	124	2E	0.04	0.00	36.26	1.24	2.35	0.00	. .	. .	. .	. .	5	. .	. .	. .	. .	. .	. .	. .
12	10001	124	2F	0.08	0.00	33.80	3.06	4.31	0.00	. .	. .	. .	. .	5	. .	. .	. .	. .	. .	. .	. .
[illegible]3	10001	124	2G	0.01	0.00	25.72	0.36	0.52	0.06	. .	. .	. .	. .	5	. .	. .	. .	. .	. .	. .	. .
19	97-1 Cutting	124	4A	0.17	9.69	18.35	0.08	34.24	0.00	. .	. .	. .	. .	. .	. .	7	. .	. .	. .	. .	. .
20	97-1 Cutting	124	4B	0.63	6.50	4.29	0.23	32.73	0.04	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	11	. .
21	97-1 Cutting	124	4C	1.25	11.29	1.95	0.16	34.60	0.00	. .	. .	. .	. .	. .	. .	7	. .	. .	. .	. .	. .
22	97-1 Cutting	124	4D	0.19	15.17	1.60	0.27	33.67	0.00	. .	. .	. .	. .	. .	. .	7	. .	. .	. .	. .	. .
23	97-1 Cutting	124	4E	0.65	11.53	0.25	0.25	35.56	0.00	. .	. .	. .	. .	. .	. .	7	. .	. .	. .	. .	. .
24	97-2 A	124	4F	0.13	10.08	17.91	0.05	33.87	0.04	. .	. .	. .	. .	. .	. .	7	. .	. .	. .	. .	. .
									17	0	0	0	0	11	0	5	0	0	0	1	0
										G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12

Eclogite Garnet Indicators




Pyrope Garnet Indicators
G10
G9
G9 / G10 boundary
(Gurney, 1985)
Peridotite Garnet
Eclogite Garnet
Cr2O3 %
16
13
10
6
3
0
CaO %
0
2
4
6
8
10
13
10
11
9
7
12
8
4
6
3
5

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

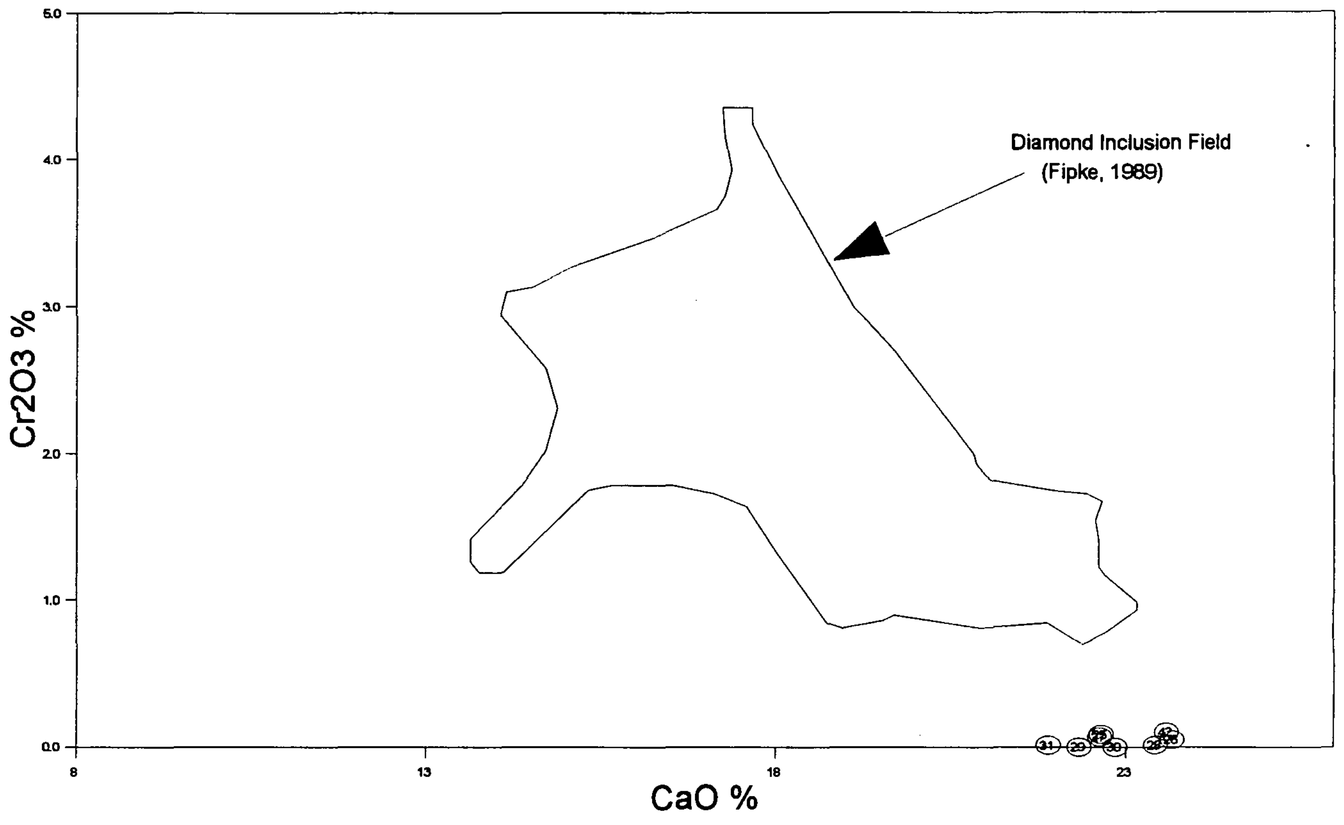
File #:39382,39216,39353
Client: Andy Glatiotis

Pyroxene Classification (after Stephens and Dawson, 1977)

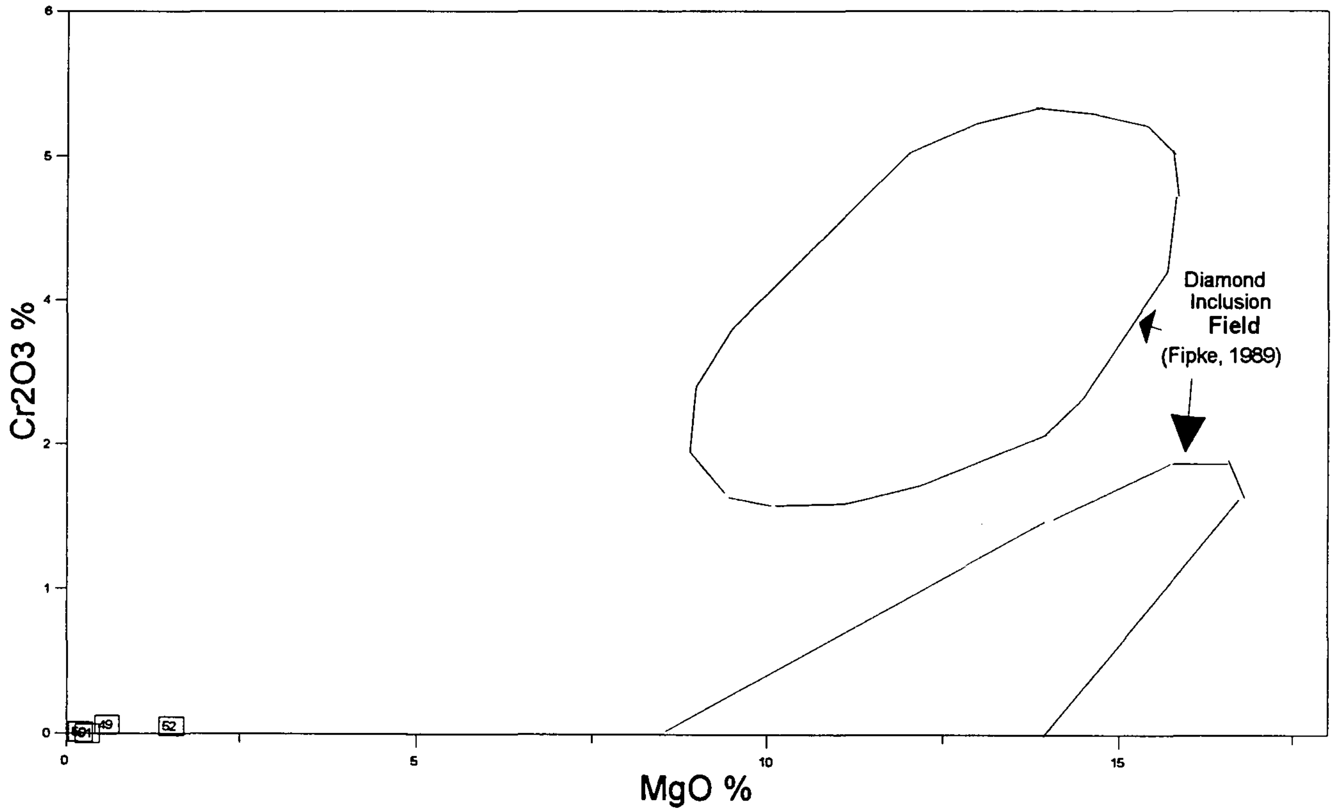
	Location			Data in wt %							ORTHOPYROXENE					CLINOPYROXENE									
G #	Sample	P#	C#	TiO2	Al2O3	Cr2O3	FeO	MgO	CaO	Na2O	1	2	3	4	5	1	2	3	4	5	6	7	8	9	10
25	97-2 A	124	4G	0.04	1.58	0.09	7.47	14.18	22.65	0.65							2								
26	97-2 A	124	4H	0.11	1.32	0.05	8.09	13.24	23.68	0.72									4						
27	97-2 A	124	4I	0.20	1.36	0.07	8.73	13.45	22.63	0.63									4						
28	97-2 A	124	4J	0.11	1.51	0.02	9.73	12.09	23.42	0.51									4						
29	97-2 A	124	5A	0.11	1.07	0.00	9.77	12.78	22.33	0.77									4						
30	97-2 A	124	5B	0.12	0.81	0.00	7.07	14.18	22.85	1.33							2								
31	97-2 B	124	5C	0.13	1.51	0.01	8.34	13.81	21.89	0.81									4						
42	97-2	124	6G	0.35	4.41	0.11	16.71	14.17	23.59	0.47									4						

		ORTHOPYROXENE					CLINOPYROXENE									
		1	2	3	4	5	1	2	3	4	5	6	7	8	9	10
Total Pyroxene =	8	0	0	0	0	0	0	2	0	6	0	0	0	0	0	0

Clinopyroxene



Ilmenite Indicators



Loring Laboratories Ltd.
629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

Date: August 29, 1997
File: 39216-D
Client : ANDY GLATIOTIS

SUMMARY OF POTENTIAL INDICATORS PICKED

Sample	Garnet	CPX	Ilmenite	Chromite	Olivine	Diamond	Total Grains	Remarks
10001	7	43	6	1	7	0	64	
Totals	**7**	**43**	**6**	**1**	**7**	**0**	**64**	

CPX = Clinopyroxene

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

FILE # : 39216-D

COMPANY: ANDY GLATIOTIS

DATE : Aug 29, 1997

	ORIGINAL WEIGHT	SCREEN ANALYSIS			TABLE CONC.	MIDDLINGS 2.9 - 3.3 SG		------------ HEAVIES >3.3 SG ------------							
								MAG.	+28	P.M.			W.P.M.		N.M.
SAMPLE ID.	(Kg)	+35 mesh (kg)	35 x 80 mesh (kg)	-80 mesh (Kg)	+80 mesh (g)	MAG. (g)	NON - MAG. (g)	(g)	Mesh (g)	0.5 (g)	0.6 (g)	0.7 (g)	1.2 (g)	2.0 (g)	2.0 (g)
10001	22.2	5.2	16.4	0.6	289	0.03	3.86	35.55	5.19	103.01	21.11	2.24	2.06	0.77	4.78

NOTE : P.M. = PARAMAGNETIC W.P.M. = WEAKLY PARAMAGNETIC N.M. = NON-MAGNETIC

[redacted]

ASSAYER

Loring Laboratories Ltd.
629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

Date: August 29, 1997
File: 39353-D
Client : ANDY GLATIOTIS

SUMMARY OF POTENTIAL INDICATORS PICKED

Sample	Garnet	CPX	Ilmenite	Chromite	Olivine	Diamond	Total Grains	Remarks
97-1 CUTTING	98	71	14	0	25	0	208	7 grains of gold
Totals	**98**	**71**	**14**	**0**	**25**	**0**	**208**	

CPX = Clinopyroxene

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

FILE # : 39353-D

COMPANY: ANDY GLATIOTIS

DATE : Aug 29, 1997

SAMPLE ID.	ORIGINAL WEIGHT	SCREEN ANALYSIS			TABLE CONC.	MIDDLINGS 2.9 - 3.3 SG		---------- HEAVIES >3.3 SG ----------							
								MAG.	+28	P.M.			W.P.M.		N.M.
	(Kg)	+35 mesh (kg)	35 x 80 mesh (kg)	-80 mesh (Kg)	+80 mesh (g)	MAG. (g)	NON - MAG. (g)	(g)	Mesh (g)	0.5 (g)	0.6 (g)	0.7 (g)	1.2 (g)	2.0 (g)	2.0 (g)
97-1 Cutting	372.4	112.0	177.6	82.8	1066	0.12	33.94	59.64	3.65	406.80	4.09	21.67	30.19	0.13	48.13

NOTE : P.M. = PARAMAGNETIC W.P.M. = WEAKLY PARAMAGNETIC N.M. = NON-MAGNETIC

[redacted]

ASSAYER

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

Date: August 29, 1997
File: 39382-D
Client : ANDY GLATIOTIS

SUMMARY OF POTENTIAL INDICATORS PICKED

Sample	Garnet	CPX	Ilmenite	Chromite	Olivine	Diamond	Total Grains	Remarks
97-2	0	0	19	0	0	0	19	
97-2 A	3	4	0	0	1	0	8	
97-2 B	3	4	3	0	0	0	10	
Totals	**6**	**8**	**22**	**0**	**1**	**0**	**37**	

CPX = Clinopyroxene

Loring Laboratories Ltd.
629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

FILE # : 39382-D

COMPANY: ANDY GLATIOTIS

DATE : Aug 29, 1997

SAMPLE ID.	ORIGINAL WEIGHT (Kg)	SCREEN ANALYSIS			TABLE CONC.	MIDDLINGS 2.9 - 3.3 SG		HEAVIES >3.3 SG							
								MAG.	+28	P.M.			W.P.M.		N.M.
		+35 mesh (kg)	35 x 80 mesh (kg)	-80 mesh (Kg)	+80 mesh (g)	MAG. (g)	NON - MAG. (g)	(g)	Mesh (g)	0.5 (g)	0.6 (g)	0.7 (g)	1.2 (g)	2.0 (g)	2.0 (g)
97 - 2	16.1	0.2	1.1	14.8	187	0.03	7.8	0.14	3.21	1.79	0.11	0.05	0.04	0.03	0.02
97 - 2 A	28.9	2.5	6.1	20.3	104	0.02	10.02	0.89	5.74	3.64	0.31	0.13	0.06	0.03	0.02
97 - 2 B	30.1	0.8	4.3	25.0	230	0.01	8.85	1.55	9.78	3.88	0.07	0.10	0.18	0.05	0.03

NOTE : P.M. = PARAMAGNETIC W.P.M. = WEAKLY PARAMAGNETIC N.M. = NON-MAGNETIC

[redacted]

ASSAYER

E - M. GLATIOTIS; SEM/KEVEX ANALYSES

Mike Glatiotis Geotechnical Contract Services

X–Ray Emmission Spectroscopy

Samples Submitted:

1) Bottle of magnetic material, black flakes with Fe Oxide coating one side, leftover from caustic fusion analysis.
2) 1 clear grain from drill cuttings Drill 97–2
3) Series of grains picked out after caustic fusion
4) Series of grains picked out after caustic fusion from drill core.
5) Series of grains panned from surface.

Samples analyzed in a Cambridge 250 Scanning Electron Microscope with a KEVEX xray emmision spectrograph.

Analyses are non quantitative. Emmissons are collected to a maximum intensity of 70 for the strongest response. Other elemental intensity is recorded relative to this 70 scale. Different elements give different emmision responses. As no standards were run, quantitative calculations are not possible.
A response indicates presense of that element. Intensty reflects relative proportions.
The KEVEX analytical tool is limited to detecting Sodium as the lightest element.

Mount #1	1	Rusty metal		Fe 70 Ca 30 Si 5
	2	Rusty metal		Fe 70 Ca 35 Si 20
	3	Rusty metal		Fe 70 Ca 5
	4	Clear stone	a)	Si 70
			b)	Si 70
	5	Grey metal		Fe 70 Ti15
Mount #2		Magnetic black flakes		Fe 70 Na 5 Ti 2
				Fe 70
Mount #3		Large, clear stone	a)	Si 70 Al 20 K 15
Caustic fusion			b)	Si 70
		Small dark stone		Al 15 Si 70 K 5
Mount #4	1	Dark translucent		Al 70 Si 50
Caustic fusion	2	Dark Purple		Si 70 Al 50
	3	Dark opaque		Al 70 Si 65 Cl 20 Na 30
	4	Blue translucent		Al 70
	5	Blue green transparent		Al 70 Si 40
	6	Dark		Al 70 Si 60
	7	Pale blue		Al 70 Si 35 Ca 10 Fe 10
	8	Dark blue		Si 70 Al 30 Mg 15
	9	green opaque		Si 70 Al 50
	10	Pale blue translucent		Al 70 Si 30
	11	Dark		Si 70 Al 60
	12	Yellow		Si 50 Al 70
	13	Clear		Si 70 Mg 20 Ca 15
	14	Clear		Si 70 Al 45

Mount #5a	1 4 micron	S70	Si 45	Cl 45	Ca 30		
Surface pans	1a 400nm	S 70	Si 45	Cl 52	Ca 25	Fe 5	
	2 2 micron	Si 70					
	2a 200nm	Si 70					
	3	Na 35	Si 39	S 45	Cl 70	K 25	
	3a	Na 45	Si 40	S 45	Cl 70	K 5	
	4	Cr 70	Fe 40	Ti 15	Al 10	Mg 10	
	5	S 70	Si 15	Ca 10			
	5a	S 70	Si 20	Cl 20	Fe 5		
	6	S70					
	7	Si 70	S 60	Ca 20			
	7a	Si 70	S 60	Ca 10	Cl 45	K 30	High background
	8	Cl 70	Na 30	Si 20			
	8a	Na 45	Si 45	S 45	Cl 70	K 20	
	9	Si 70					
	9a	Si 70					
	10	Al 70	Si 30	Fe 10			
	10a	Al 70	Si 30	Fe 10			
Mount 5b)	1 metallic looking	Si	S	Cl			
Surface pans	2 pale blue	Al 70	Si 20				Amorphous around Si
	3 metallic looking	Si 30	S 35	Cl 70			
	3a metallic looking	Na 20	S1 40	S 30	Cl 70	K 20	
	4 pale blue	Cl 70	Si 30	S 30			
	5 pale blue	Al 70	Si 50				
	6 metallic looking	Si 70					
	7 orange	Al 70					
	8 pink	Cl 70					Amorphous around Si, Al.
	8a pink	Cl 70					Amorphous around Si, Al.
	9 pink	Al 30	Si 70	K 5	Fe 5		
	10 orange	Al 70					
	11 pink	Si 70	Al 30	Mg 20	Ca 35	Cr 25	
	12 hexagonal clear	Si 55	P 70				
	12a hexagonal clear	Si 55	P 70				
	13 clear	P 70	Si 45	Fe 5			
	13a clear	Al 70					
	13b clear	Al 70					
	14 clear	Si 70					
	14a clear	Si 70					
	15 clear	Al 70	Fe 10				
	16 clear	Si 70					
	16a clear	Si 70					
	17 clear	Al 70					
	18 brown	Al 70	Ti 5				
	19 orange	Al 70	Fe 25				
	20 Clear	Si 70					

F - ASHTON MINING: HAND SPECIMEN WHOLE ROCK ANALYSES

COMP: ASHTON MINING OF CANADA INC.
PROJ: 1210 N.AMERICA GENERAL
ATTN: JEFF BRENDON

MIN-EN LABS – WHOLE ROCK ANALYSIS

8282 SHERBROOKE ST., VANCOUVER, B.C. V5X 4E8
TEL:(604)327-3436 FAX:(604)327-3423

FILE NO: 5V-0228-RL1
DATE: 95/07/18
high high * ROCK * (ACT:F26)

SAMPLE NUMBER	AL2O3 %	BA %	CAO %	FE2O3 %	K2O %	high MGO %	low MNO %	NA2O %	P2O5 %	SIO2 %	SR %	wt TIO2 %	LOI %
RH-R1	10.72	.520	5.82	6.36	6.40	7.05	.09	2.71	.95	55.16	.040	.83	2.20
+ RH-R2 —	10.88	.350	6.06	6.36	6.40	5.95	.10	2.57	1.25	56.83	.065	.66	1.40
RH-R3	12.85	.180	3.20	4.90	3.93	.81	.09	3.84	.17 !	67.35	.030	.81	1.10
RH-R4	12.05	.035	7.55	15.42	2.50	4.00	.19	1.95	.36	51.33	.035	2.77	.70
RH-R5	8.02	.055	1.48	5.55	2.42	2.42	.11	1.56	.04	74.41	.020	.46	2.50
KIMBERLITE MEAN	4.4	0.11	7.6	—	0.98	27.9	0.11	0.32	0.7	35.2	0.09	2.3	—

Representative average compositions of lamproites (after Bergman, 1987)

	Leucite Hills USA (24)	Murcia-Almeira Spain (51)	West Kimberley Australia (98)	Average lamproite (worldwide) (309)
		Volatile Free (wt%)		
SiO_2	52.7 ± 3.8	51.3 ± 6.6	57.4 ± 5.2	52.5 ± 6.6
TiO_2	2.4 ± 0.3	5.1 ± 1.5	1.5 ± 0.2	3.0 ± 1.7
Al_2O_3	10.8 ± 1.4	7.2 ± 2.4	10.5 ± 1.8	9.0 ± 2.5
FeO*	5.1 ± 1.4	7.1 ± 1.1	5.3 ± 1.1	6.8 ± 2.2
MnO	0.9 ± .03	.09 ± .03	.08 ± .05	0.10 ± .05
MgO	8.4 ± 2.3	11.7 ± 7.5	10.5 ± 4.7	12.3 ± 6.6
CaO	6.7 ± 3.8	6.0 ± 8.0	4.9 ± 2.4	6.1 ± 4.4
Na_2O	1.3 ± 0.5	0.5 ± 0.3	2.0 ± 1.0	1.4 ± 1.0
K_2O	10.4 ± 2.4	8.3 ± 2.9	6.6 ± 2.2	6.9 ± 2.8
P_2O_5	1.5 ± 0.6	1.1 ± 0.6	1.1 ± 0.5	1.3 ± 0.7
BaO	0.67 ± 0.3	1.2 ± 0.8	0.3 ± 0.2	0.7 ± 0.6
ZrO_2	0.22 ± 0.7	0.15 ± 0.4	.08 ± .04	0.13 ± .07
		Volatile Content (wt%)		
H_2O+	2.6 ± 1.2	3.0 ± 1.8	2.8 ± 1.7	2.6 ± 1.8
CO_2	1.0 ± 1.0	1.9 ± 5.5	1.7 ± 2.3	2.7 ± 3.9

( ) = number of samples

reprinted from GSC Bulletin 423,1995
Diamond Exploration Techniques
Fipke,Gurney, Moore

TABLE 2

+ R2 IS FROM North side of FARREL LAKE

RH-R1, -R3, -R4, -R5.
Clain Clain Pearl Clain. off. Dr. YOSHIDA'S claims

COMP: ASHTON MINING OF CANADA INC.
PROJ: 1210 N.AMERICA GENERAL
ATTN: JEFF BRENDON

MIN-EN LABS — ICP REPORT

8282 SHERBROOKE ST., VANCOUVER, B.C. V5X 4E8
TEL:(604)327-3436 FAX:(604)327-3423

FILE NO: 5V-0228-RJ1
DATE: 95/07/12
* ROCK * (ACT:F31)

low low X

Low X

SAMPLE NUMBER	AG PPM	AL %	AS PPM	BA PPM	BE PPM	BI PPM	CA %	CD PPM	CO PPM	CR PPM	CU PPM	FE %	GA PPM	K %	LI PPM	MG %	MN PPM	MO PPM	NA %	NI PPM	P PPM	PB PPM	SB PPM	SN PPM	SR PPM	TH PPM	TI %	U PPM	V PPM	W PPM	ZN PPM
RH-[illegible]	1.7	1.04	26	1159	1.6	15	1.48	.1	24	178	60	2.80	1	.91	19	2.50	205	1	.08	71	3850	96	1	4	417	1	.19	1	48.6	4	86
[illegible]	.7	.27	114	509	1.6	7	1.87	.1	9	241	5	1.30	1	.36	15	1.00	148	1	.11	28	5170	11	1	2	943	12	.06	1	27.8	10	30
[illegible]	.4	.45	30	67	.6	11	.89	.1	9	269	10	2.25	1	.16	7	.39	193	3	.10	16	860	29	1	2	52	1	.08	1	20.2	13	45
[illegible]	1.1	1.37	1	53	.9	13	1.22	.1	27	115	325	5.14	1	.56	30	.80	347	1	.24	31	1430	38	1	5	64	1	.17	1	217.7	6	89
RH[illegible]	.1	1.20	1	64	.9	6	.79	.1	14	106	15	2.81	1	.13	24	1.50	616	1	.05	22	330	14	1	4	10	1	.02	1	30.8	2	45
KIMBERLITIC GAIN				1100					65	890	93									985					250				100		69
KIMBERLITIC RANGE				137-1990					35-130	56-2400	10-300									700-1600					20-1400				21-250		15-287

G - DR. NASSICHUK: X-RAY DIFFRACTOGRAM OF CORE FROM 314', 95-1

Raymond Haimila

TO: DR. W. NASSICHUK FILE#: 96-XR-01

FROM: JENNY WONG
Clay Mineralogy lab.

DATE: JAN.8, 1996

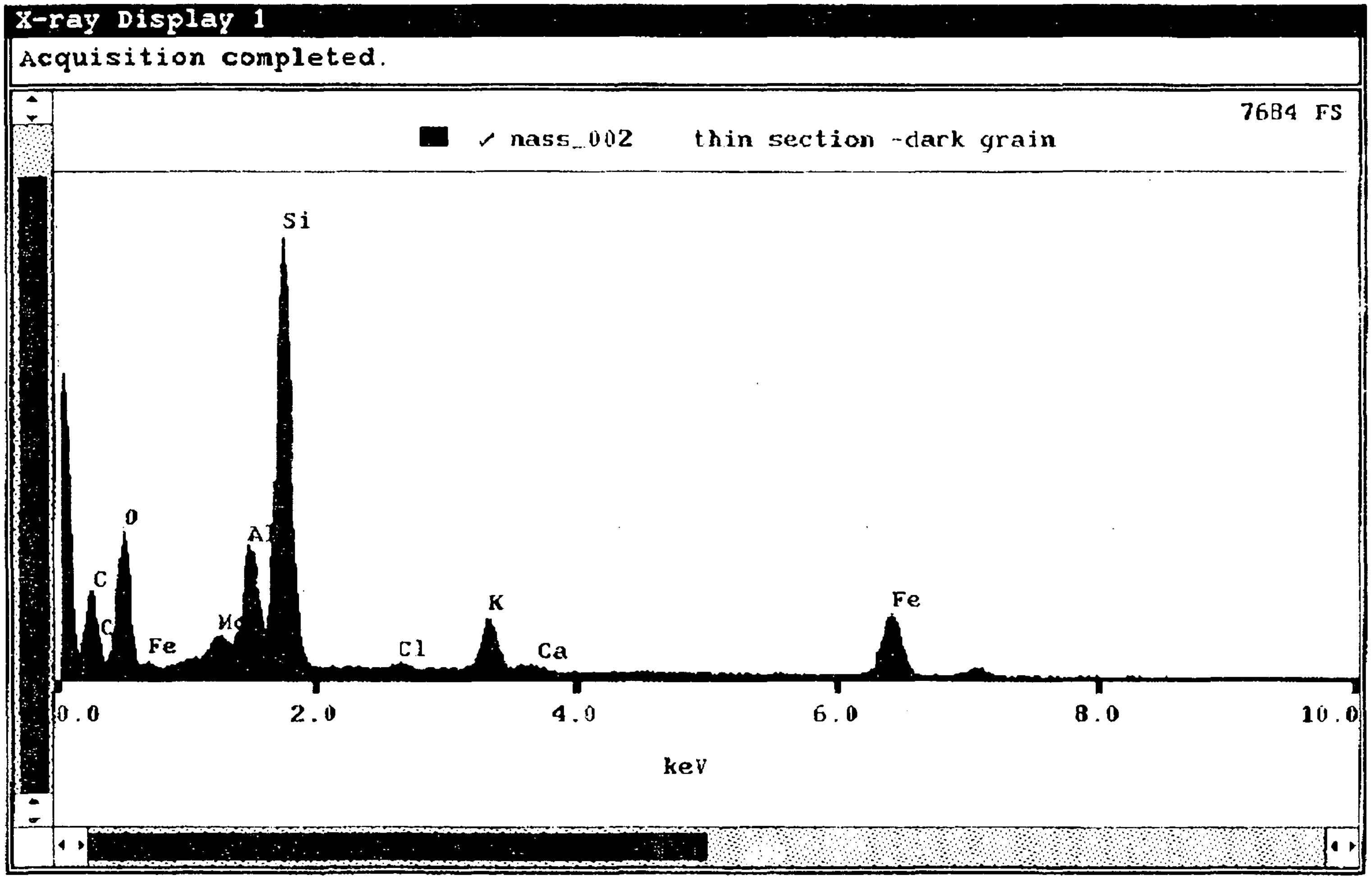
RE: MINERAL DETERMINATION OF ONE CHAIN LAKE CORE SAMPLE

X-ray powder diffraction analysis was carried out on one Chain Lake core. Diffractogram reveals the follow minerals:

NADS01 (Chain Lake Core)

	Expandable/Mixed Layer clays	2%
	Mica	1%
	Chlorite/Kaolinite	tr
	Quartz	69%
	K-feldspars	tr
	Plagioclase	5%
	Siderite,manganoan	20%
IRon Sulphide	Greigite?	3%

nass-002 area analys. - on a dark grain



X-ray Display 1

Acquisition completed.

7684 FS

▆ ✓ nass_002 thin section -dark grain