MAR 20030008: ST. PAUL

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New Claymore Resources Ltd.

ASSESSMENT REPORT ON THE ST. PAUL PERMITS

FOR THE PERIOD FEBRUARY 2001 - 2003

written by
Anthony Rich, P.Geol.

June 10, 2003

New Claymore Resources Ltd.
St Paul, Alberta

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St Paul Alberta

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August 14, 2001
June 28. 2002

NEW CLAYMORE RESOURCES LTD.
ST. PAUL PROSPECT, NORTH CENTRAL ALBERTA

1. SUMMARY

New Claymore Resources Ltd. St Paul Prospect is within topographic map areas 74E/13 and 14, and 73L/4 and 5 located around the towns of St. Paul and Two Hills in east central Alberta. The prospect comprises 34 Metallic and Industrial Mineral Permits (Permits) which encompass an area of 271,000 hectares (678,000 acres).

Geochemical surveying of beach sediments on larger lakes in the area revealed excellent diamond indicator mineral chemistry. Follow up work by airborne magnetic survey failed to reveal any targets and consequently most of the permit area is being relinquished.

Certain topographical features were surveyed by magnetic and gravity surveys.

2. INTRODUCTION

New Claymore Resources Ltd. has held permits in the St. Paul area since 2001. The property was purchased from Raymond Jalbert of St. Paul.

Before acquiring the permits, the Company was approached by Ray Jalbert who had been sampling beaches in the area for some months. He showed us that many of the beaches were exceptional high in garnets, so much so that they are immediately visible.

These garnets and other beach minerals were analysed and yielded a large number of G9 and G10 garnets.

The Company employed an airborne magnetic survey in an attempt to find targets in the area of the high geochemistry.

3. LOCATION, ACCESS, PHYSIOGRAPHY

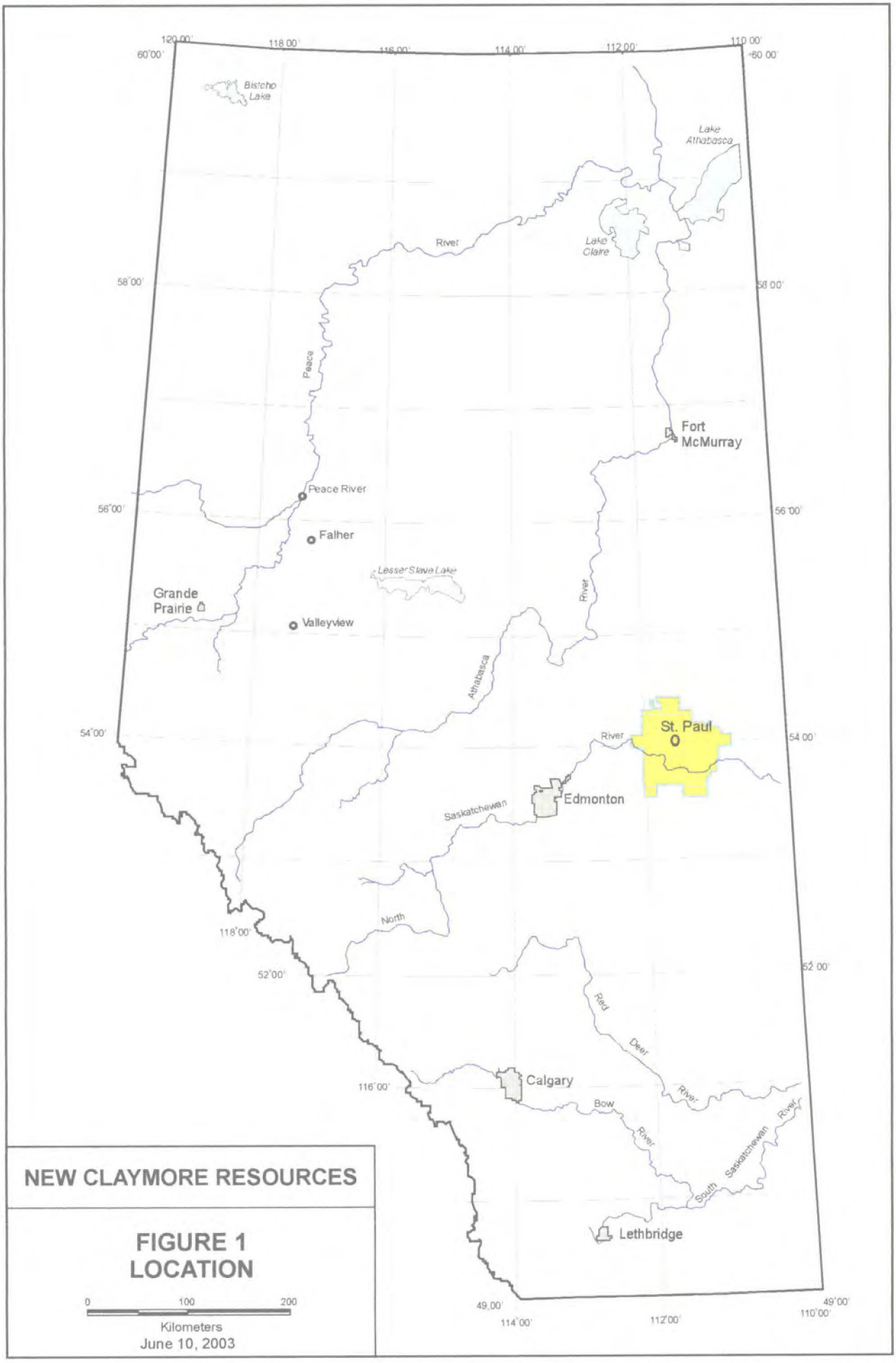
The Mountain Lake prospect is located within topographic map areas 73 E/13 & 14; 73 L/3 & 4, east central Alberta. The prospect is centered about 54° 05' 00" N latitude and 111° 30' 00" W longitude and mostly located about around the town of St. Paul. (Fig. 1).

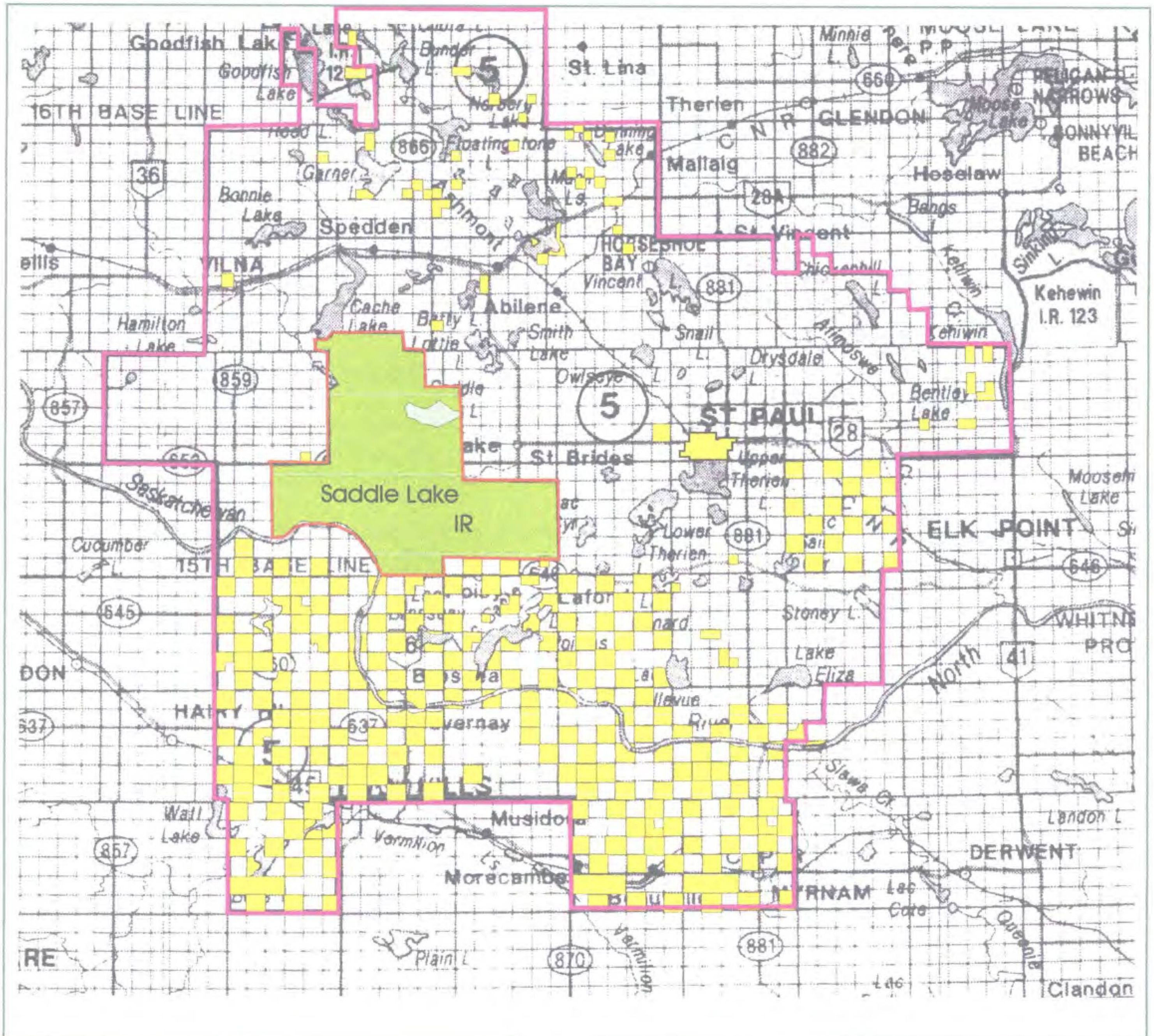
The entire St. Paul Lake prospect is accessible by road. Secondary road allowances cover much of the area but some ATV access is required.

Topographic relief is low over the entire area. The southeast portion of the property is knob-and-kettle country. There is some sandstone outcrop on the North Saskatchewan River near Duvernay. Vegetation is dominated by stands of aspen poplar with some white spruce and jack pine occurring.

4. PERMIT TABULATION

The St. Paul prospect consists of 34 Permits located in east central Alberta,. all in the name of New Claymore Resources Ltd. The permit block is shown on Figure 2


120 00'
118 00'
116 00'
114 00'
112 00'
110 00'
60°00'
60 00'
Bistcho Lake
Lake Athabasca
River
Lake Claire
58°00'
58 00'
Peace
Fort McMurray
Peace River
56°00'
56 00'
Falher
Lesser Slave Lake
River
Grande Prairie
Valleyview
Athabasca
54°00'
St. Paul
River
54 00'
Edmonton
Saskatchewan
North
118°00'
52°00'
52 00'
Red Deer River
Calgary
116°00'
Bow River
South Saskatchewan River
Lethbridge
49 00'
49°00'
114°00'
112°00'
110°00'
NEW CLAYMORE RESOURCES
FIGURE 1
LOCATION
0
100
200
Kilometers
June 10, 2003



Freehold lands

Permit boundary

NEWCLAYMORE RESOURCES LTD

Saint Paul Area Alberta

Figure 2

Mineral Permits

June 10, 2003

The assessment was carried out several of the permits but we require the work to maintain only a small portion of one Permit of the original group.

PERMIT NUMBER	COMMENCEMENT OF PERMIT TERM	REGISTERED HOLDER OF PERMIT
9301020001- 34	February 25, 2001	New Claymore Resources Ltd.

The report is written by Anthony Rich, P.Geol., President of New Claymore Resources Ltd.

5. WORK PERFORMED

5.1 GEOCHEMICAL SAMPLING

In 2002, New Claymore carried out and aggressive program of beach sampling of lakes in the St Paul Area. 14 beaches were sampled and the samples sent to IOS Services Géoscientifiques Inc. in Québec for analysis. Copies of the mineralogical reports are appended. Two of the garnet beaches are shown on Figure ~~3~~.

The resulting indicator mineral analyses are best observed on Figure 4, and Figure 5. Since the lakes are so wide-spaced, it is difficult to estimate the source of the indicators, particularly since the area has been glaciated from two directions.

5.2 AIRBORNE MAGNETOMETER SURVEYS

In August 2002, Kaj Hedin of Calgary was contracted to fly about 150,000 acres for airborne magnetics. This operation was carried out very quickly. The results were not reduced to a map but were observed in profile on computer. The magnetic picture of this area is amazingly featureless. No targets were observed in and up-ice of the geochem. anomalies. Since they are not in a form acceptable to the Government, the airborne magnetic results are not submitted herewith, neither are the costs claimed as assessment.

5.3 GROUND MAGNETOMETER and GRAVITY SURVEYS

To the southeast of Upper Therien Lake, a number of sharp hills were observed. It was decided to conduct a ground magnetic survey over a number of these and almost all showed a positive magnetic anomaly associated with the hill. Since it was difficult to explain these features, a gravity survey was also carried out over one of the hills (Hill 1 Bouguer)

The gravity survey gave a Bouguer low which mirrored topography and the magnetic high. Therefore, these hills are glacial features. The magnetics can only be explained by a higher than normal concentration of magnetite in the till.

Both magnetometer and gravity readings were taken on a 12.5 m grid. Magnetometer readings were collected using a GEM Systems GSM-19 integrated Overhauser effect proton precession magnetometer system. The shoulder-mounted GEM GSM-19 instrument contains an external magnetometer sensor consisting of two coils of copper wire immersed in a proton rich liquid contained in a sealed Pyrex cylinder. At each station, the sensor reads the total magnetic field strength (nT) and the data was stored in the GSM-19 instrument memory. The magnetic readings were corrected for terrestrial field magnetic variation using an GSM-19 base station programmed to collect geomagnetic field strength readings at 5 second intervals. The magnetometer data collected were transferred to an IBM compatible microcomputer using 'Gemlink' software. The software produces magnetometer data for both field readings and data which is corrected for diurnal variation. The mag survey was carried out in May 2002

Beaches on Lower Therien Lake near St. Paul, Alberta

NEW CLAYMORE RESOURCES LTD
Figure 3
June 10, 2003

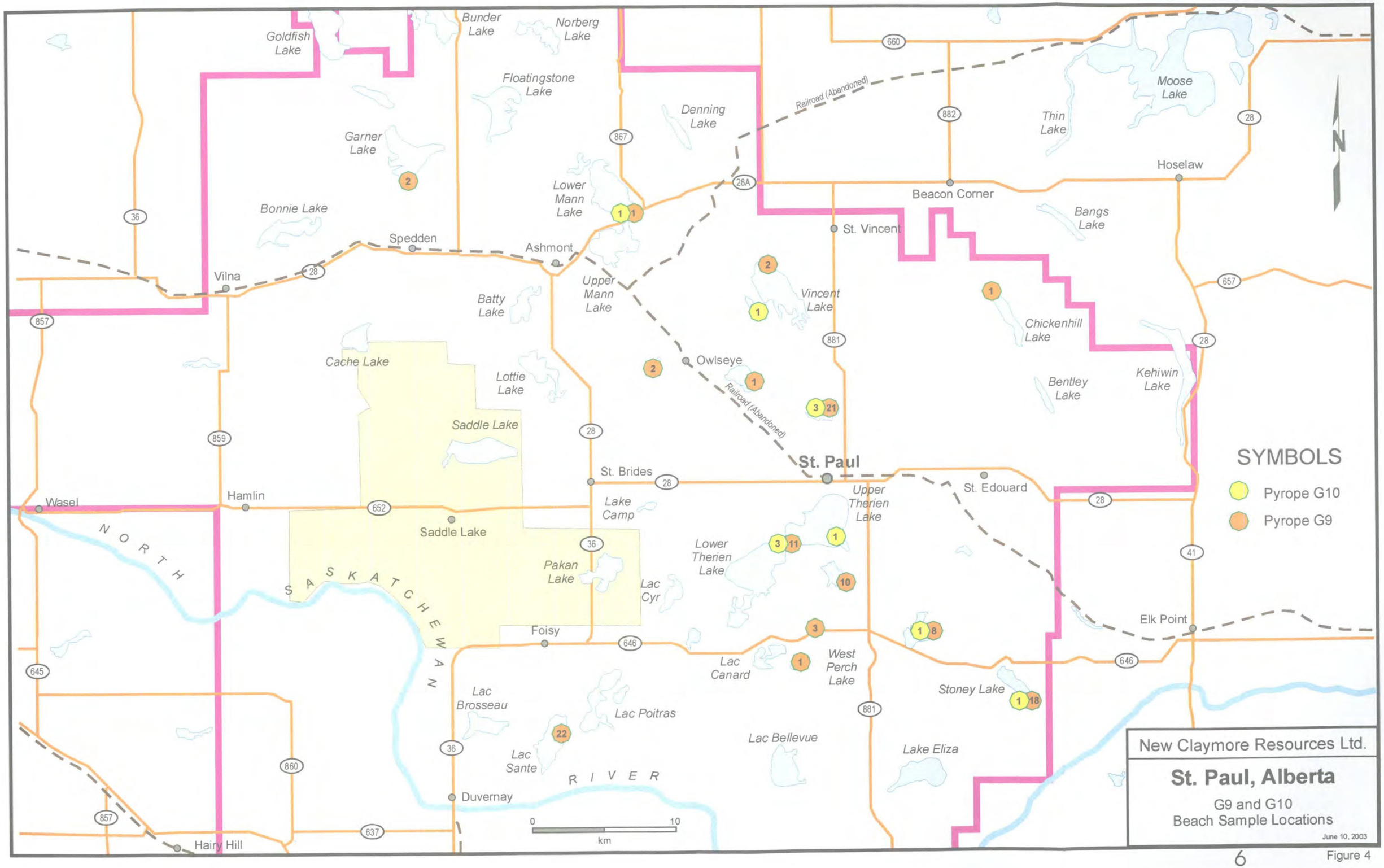
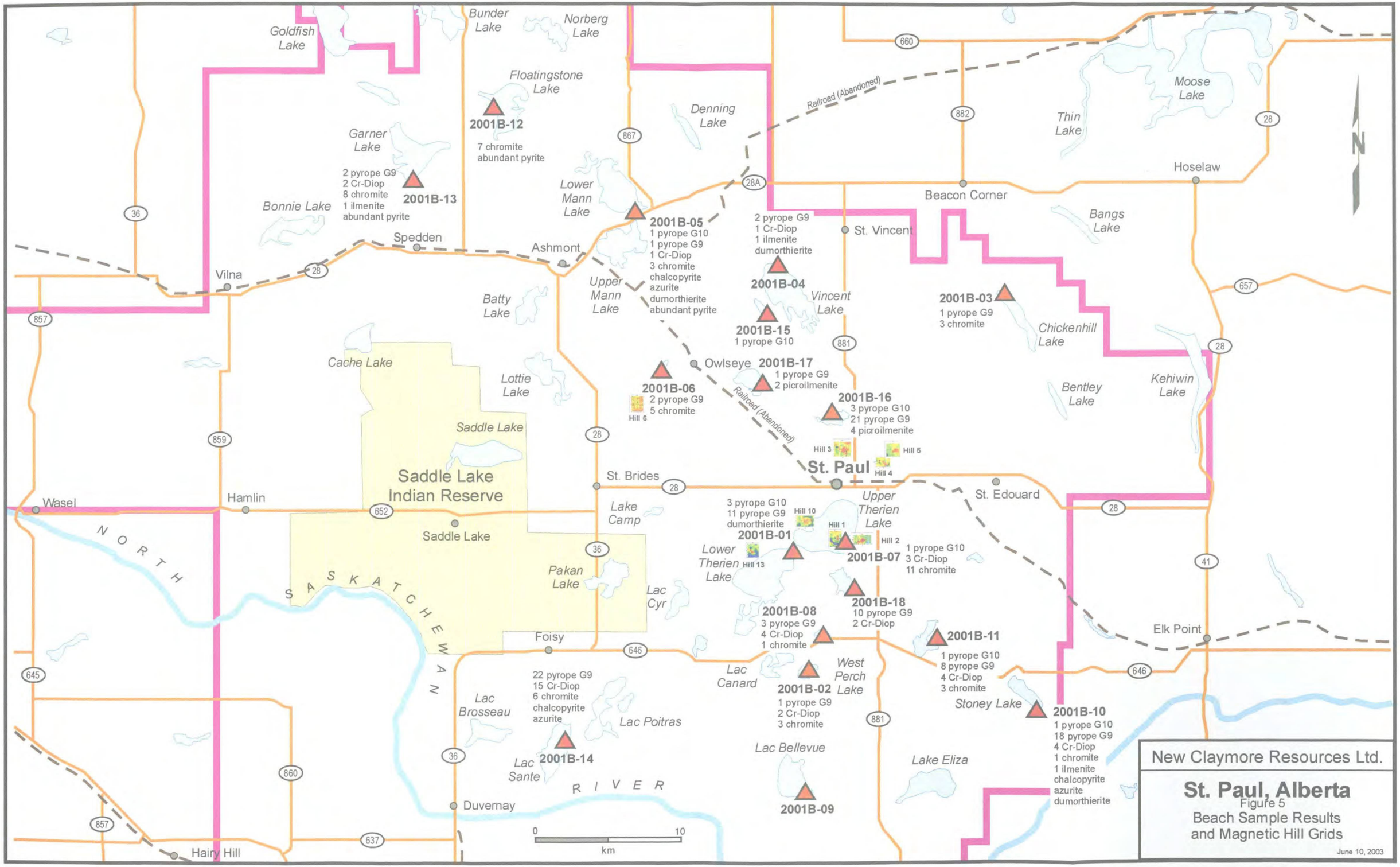

Goldfish Lake
Bunder Lake
Norberg Lake
Floatingstone Lake
Denning Lake
Railroad (Abandoned)
660
882
Moose Lake
Thin Lake
28
867
Garner Lake
Hoselaw
28A
Beacon Corner
Lower Mann Lake
Bonnie Lake
36
Bangs Lake
St. Vincent
Spedden
Ashmont
Vilna
28
Upper Mann Lake
Batty Lake
Vincent Lake
657
857
Chickenhill Lake
881
Owlseye
Cache Lake
Lottie Lake
Railroad (Abandoned)
Bentley Lake
Kehiwin Lake
28
Saddle Lake
859
28
St. Brides
St. Paul
St. Edouard
Lake Camp
Upper Therien Lake
Wasel
Hamlin
652
Saddle Lake
NORTH SASKATCHEWAN RIVER
36
Pakan Lake
Lac Cyr
Lower Therien Lake
41
Elk Point
Foisy
646
645
Lac Canard
West Perch Lake
Lac Brosseau
Lac Poitras
Stoney Lake
881
Lac Bellevue
Lake Eliza
860
Lac Sante
36
Duvernay
857
637
Hairy Hill
0
10
km
N
SYMBOLS
Pyrope G10
Pyrope G9
New Claymore Resources Ltd.
St. Paul, Alberta
G9 and G10
Beach Sample Locations
June 10, 2003

Figure 4



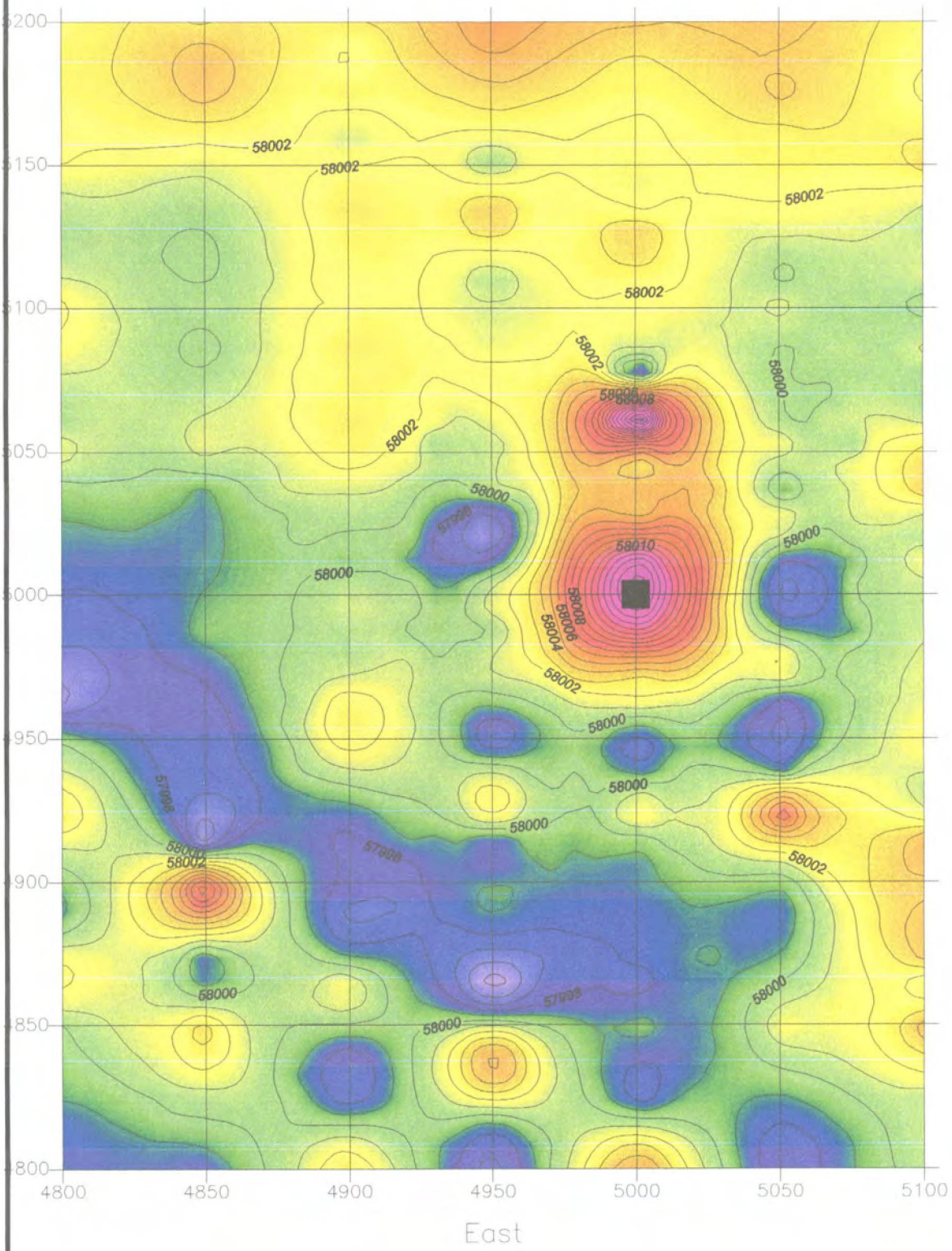
New Claymore Resources Ltd.

St. Paul, Alberta

Figure 5
Beach Sample Results
and Magnetic Hill Grids

June 10, 2003

HILL 1



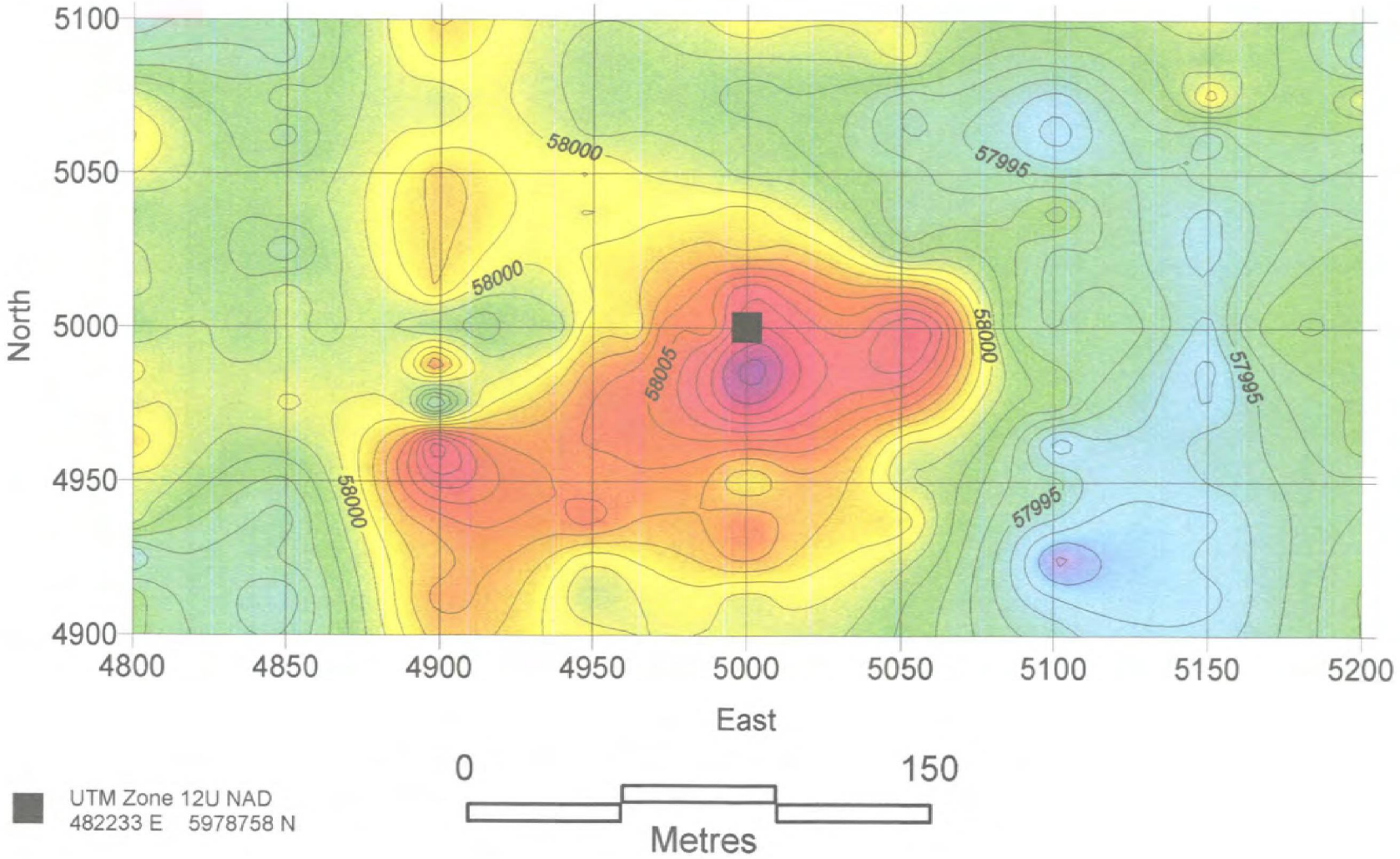
0 150

Metres

UTM Zone 12U NAD
481400 E 5978900 N

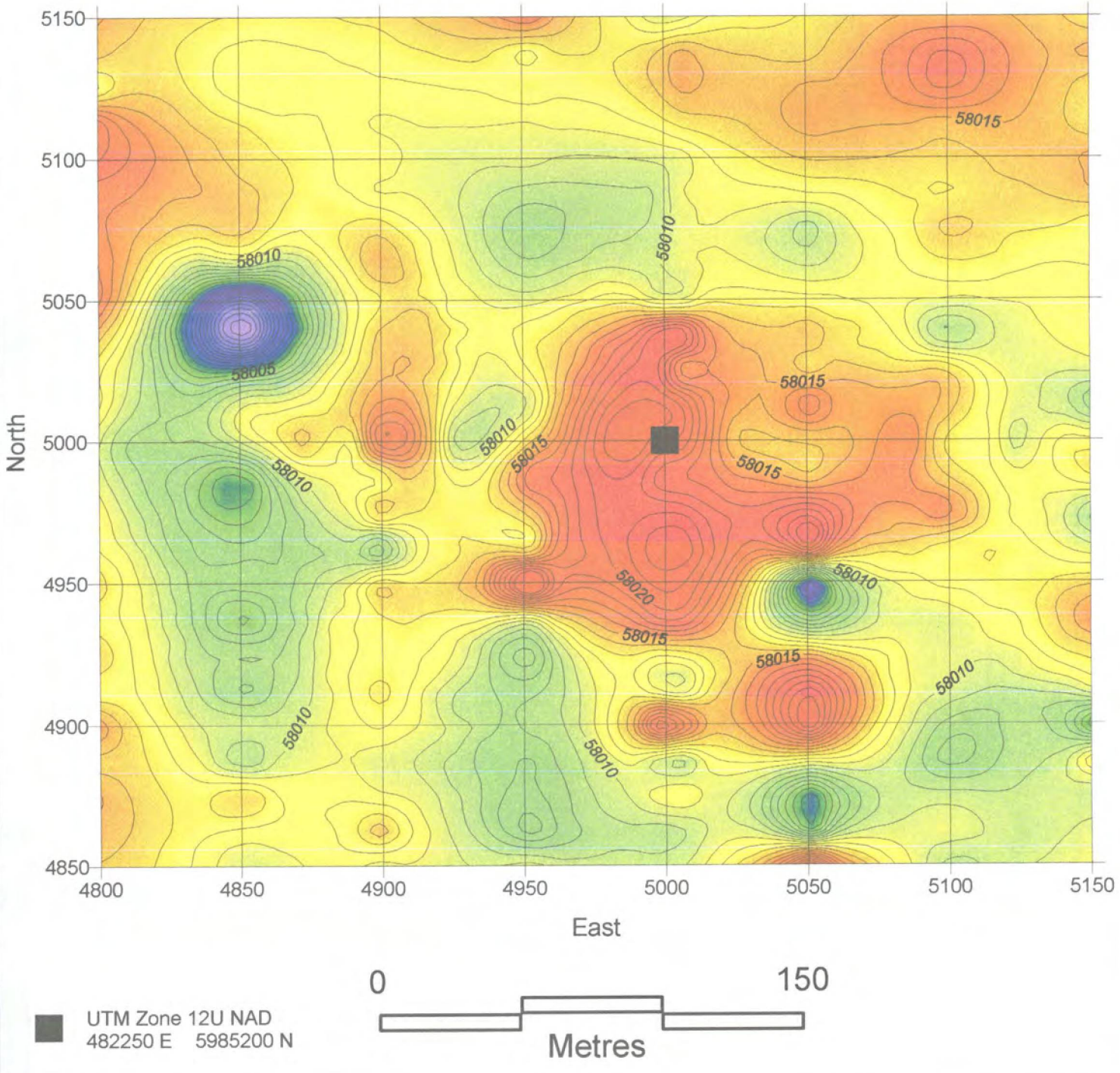
New Claymore Resources June 10, 2003

HILL 2

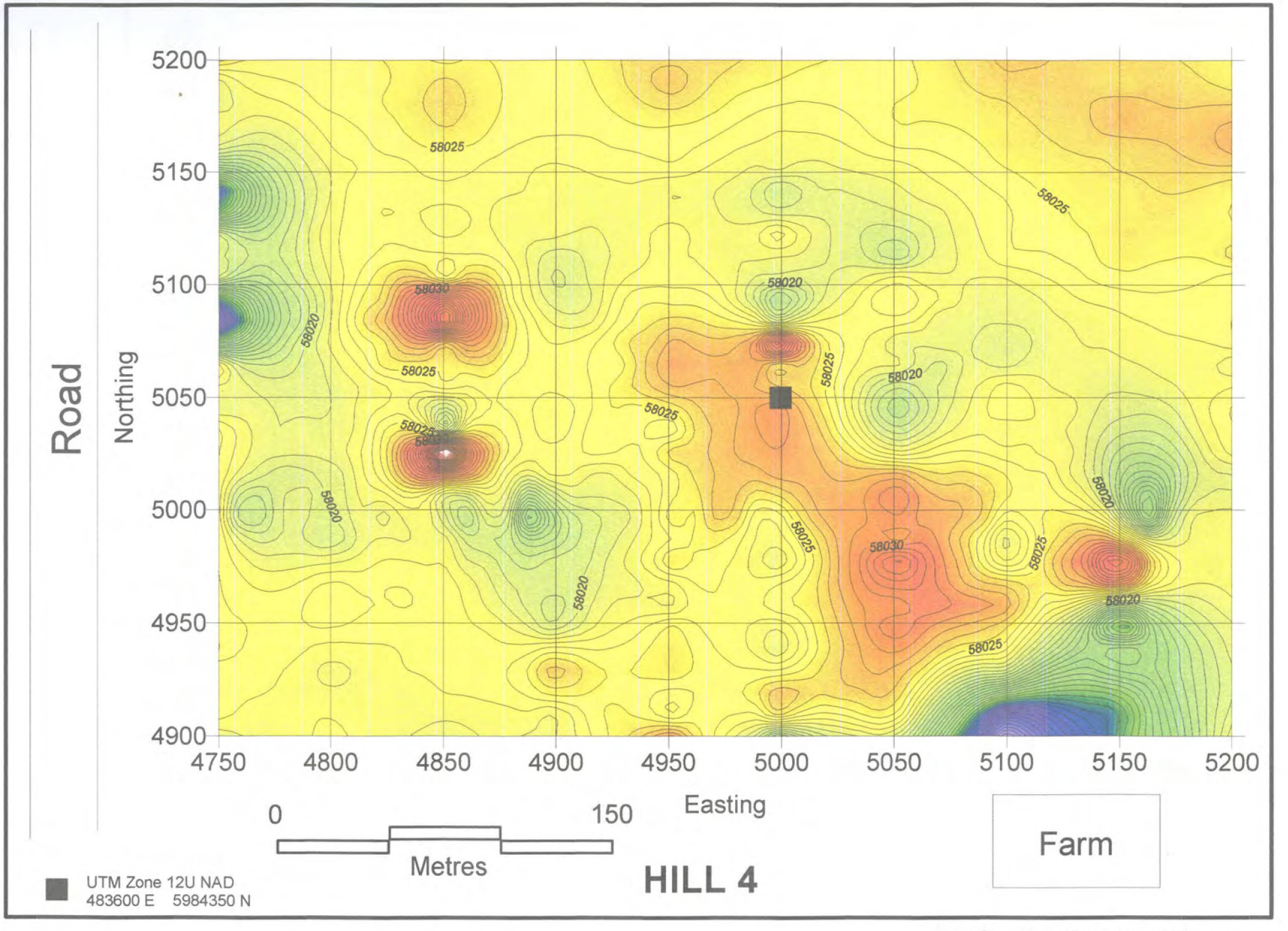


New Claymore Resources Ltd. June 10, 2003

HILL 3

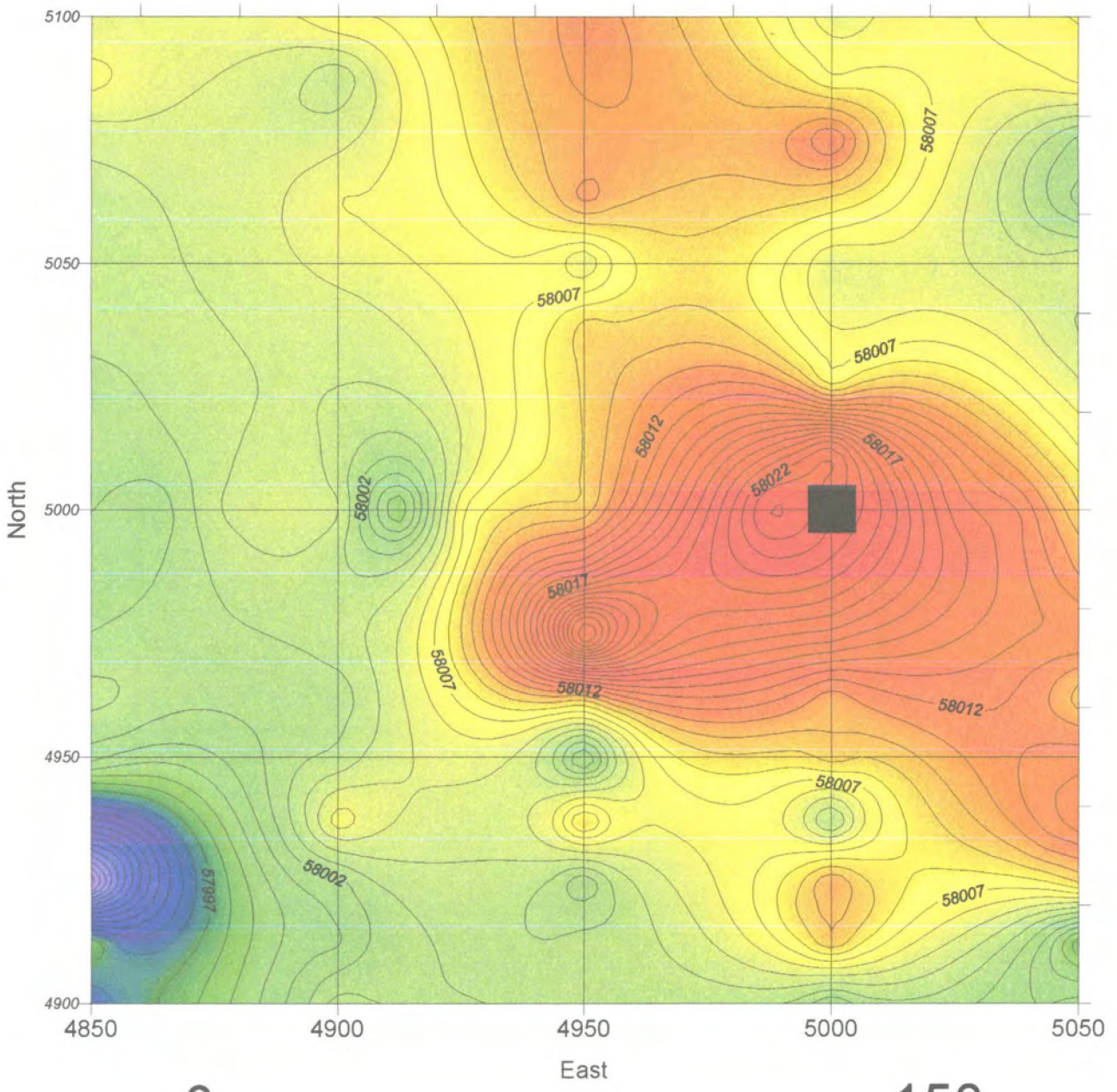


New Claymore Resources Ltd.



New Claymore Resources Ltd

HILL 5



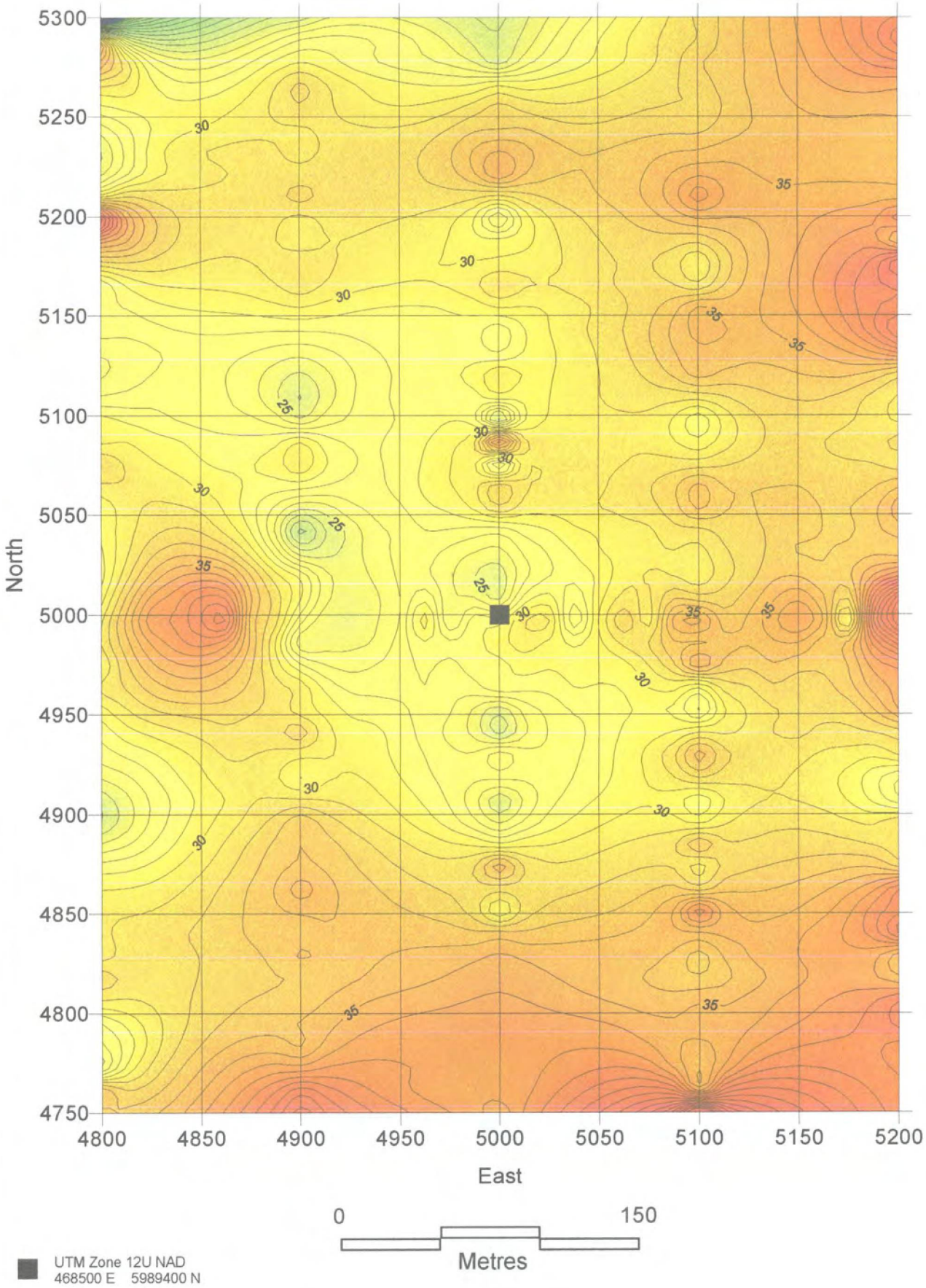
0 150

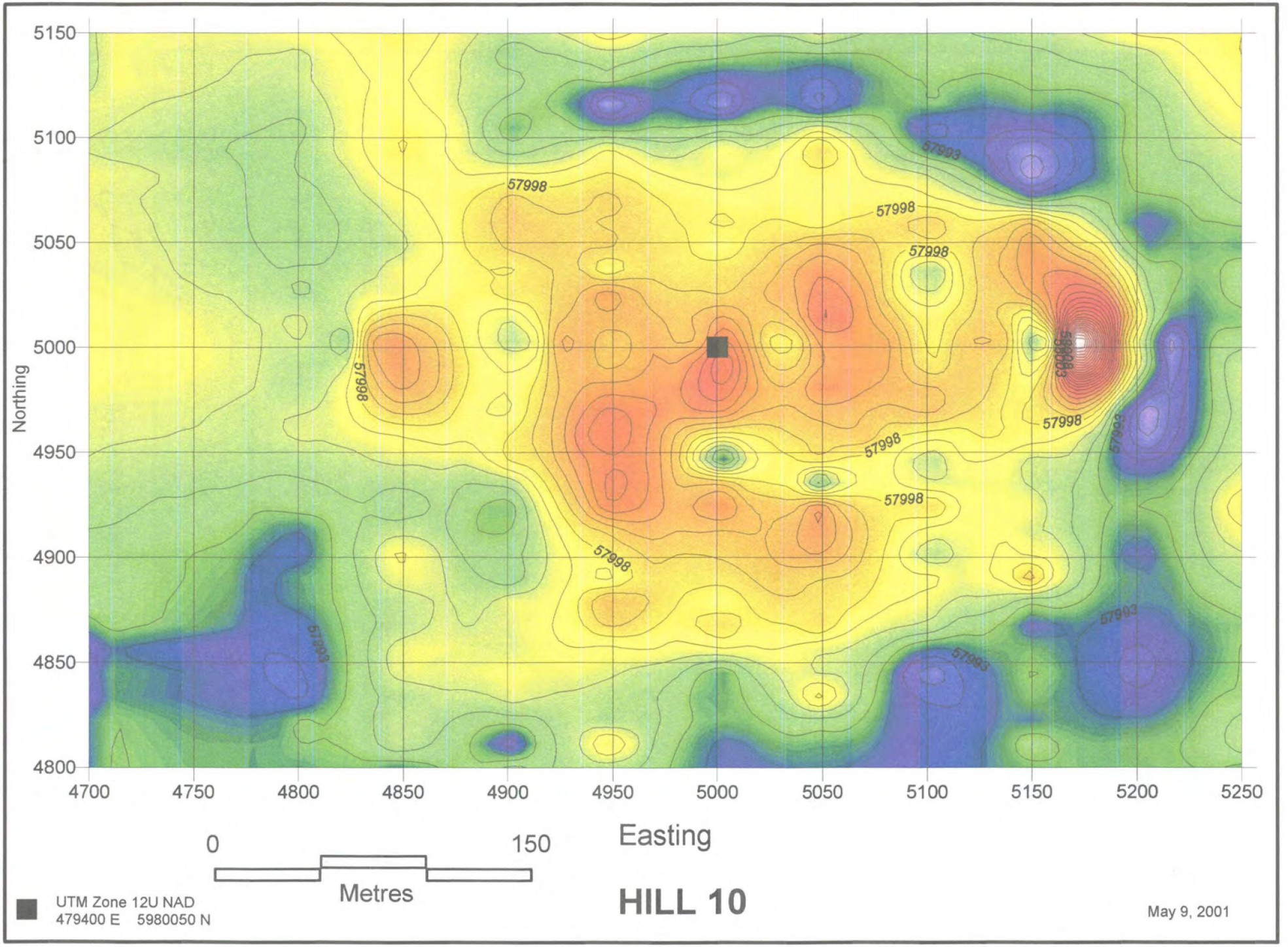
Metres

UTM Zone 12U NAD
484500 E 5984700 N

New Claymore Resources Ltd June 10, 2003

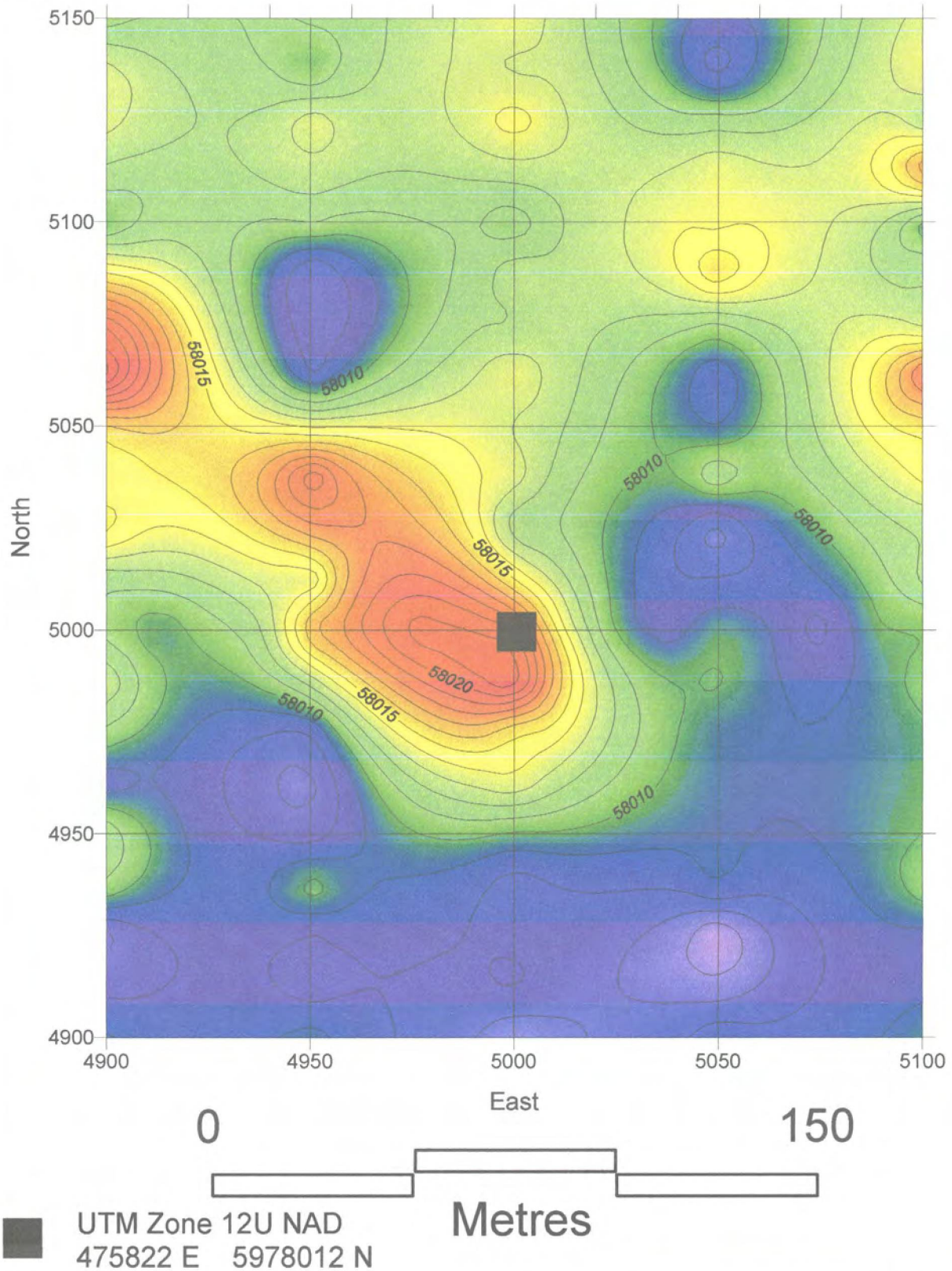
HILL 6


5300
5250
5200
5150
5100
5050
5000
4950
4900
4850
4800
4750
North
4800
4850
4900
4950
5000
5050
5100
5150
5200
East
30
35
25
0
150
Metres
UTM Zone 12U NAD
468500 E 5989400 N



New Claymore Resources Ltd. June 10, 2003

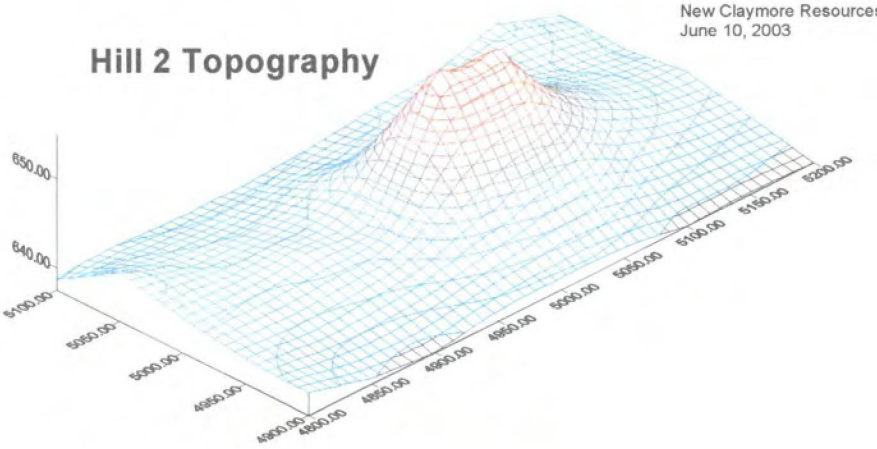
HILL 13



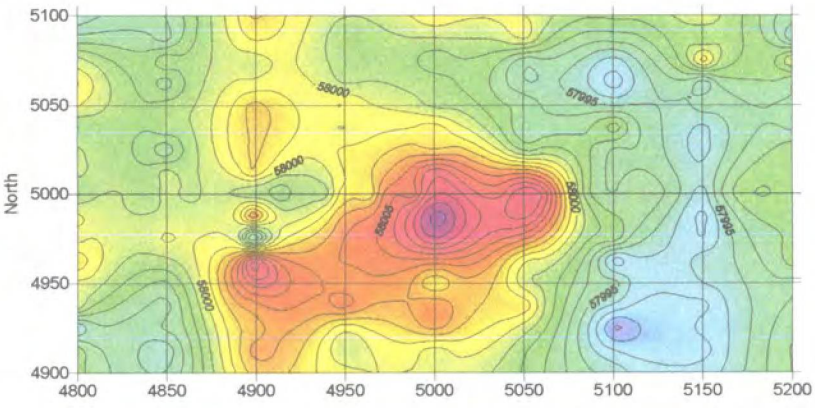
New Claymore Resources Ltd. June 10, 2003

New Claymore Resources Ltd
June 10, 2003

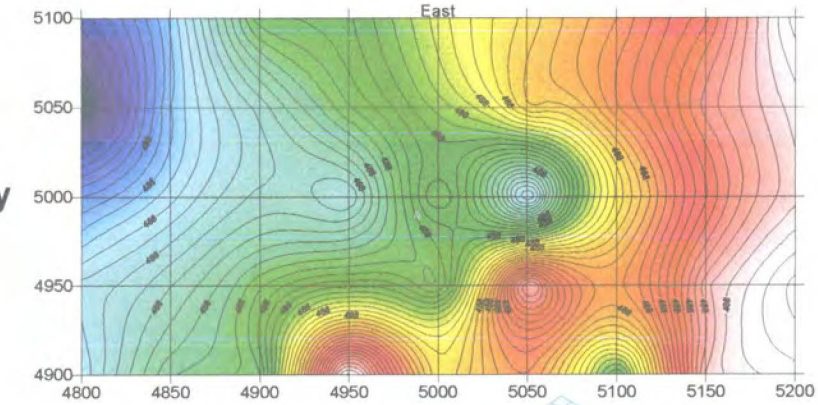
Hill 2 Topography



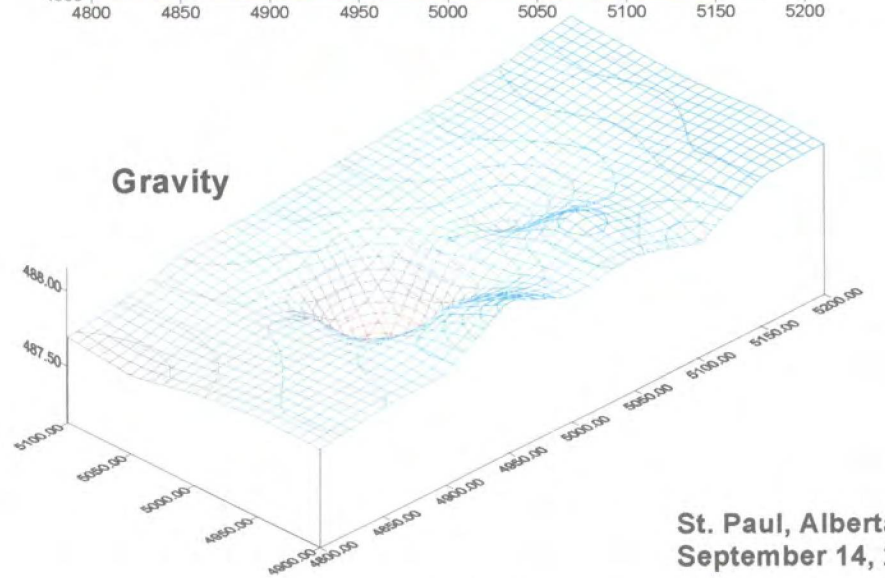
Ground Mag



Gravity



Gravity



St. Paul, Alberta
September 14, 2001

The gravity survey was carried out in September 2002 by Anthony Rich and Robert Ryziuk. Gravity readings were taken using a Scintrex SG3 meter. This instrument uses a thermostat and automatically compensates for both instrument and diurnal drift. A gravity survey relies upon an accurate vertical survey of all gravity stations. This was carried out by Anthony Rich using a Wild T0 theodolite and a stadia rod. Since there were several months between the mag. Survey and the gravity, the grid had to be relocated. Hill 1 area is mostly cleared open fields but the very top of the steep hill is bush covered.

5.4 COSTS OF EXPLORATION

Assessment Costs 2001 - 2003

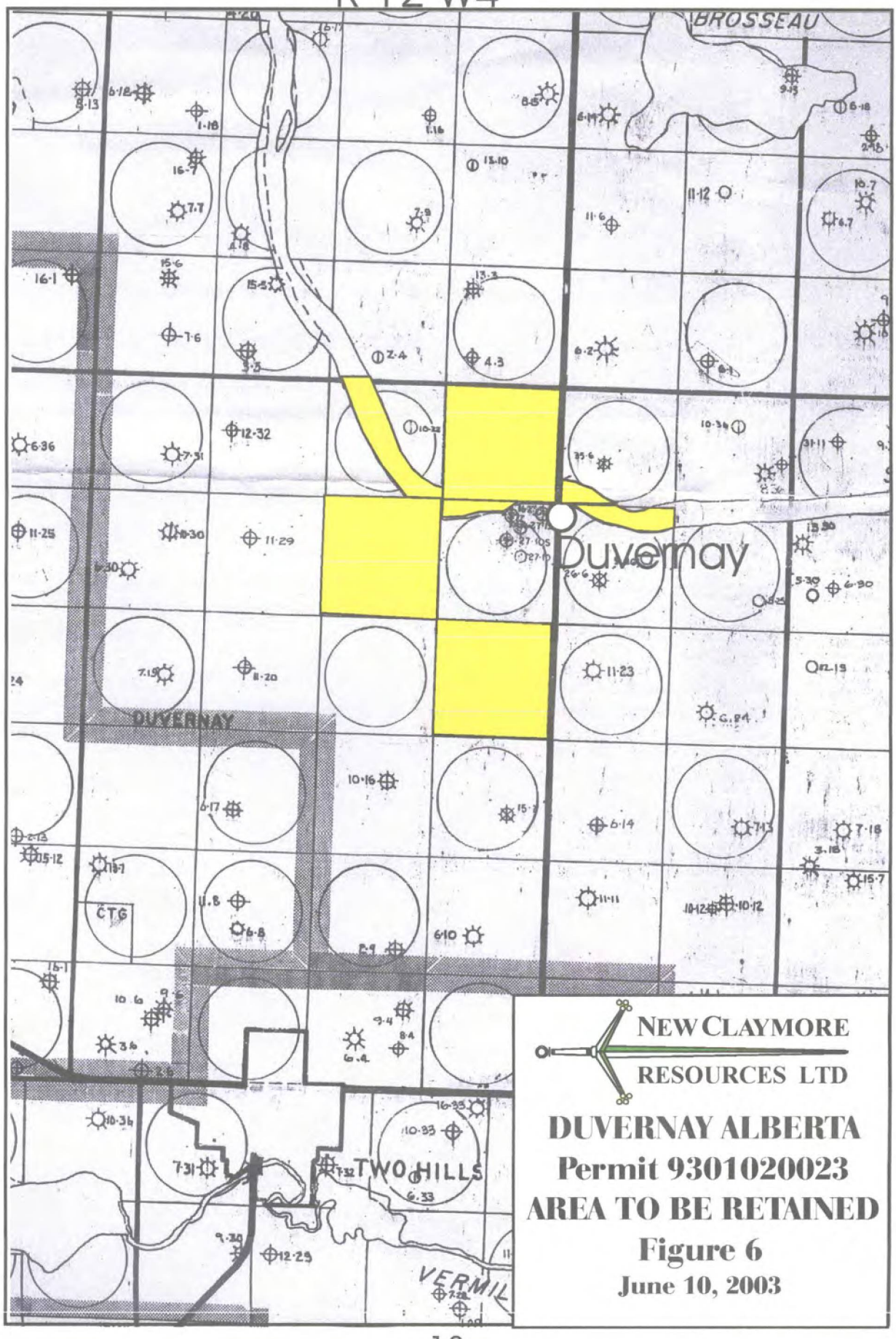
		Costs	
Geochemical Survey Sept 2001, May - July 2002	Travel and Accommodation	$4,240.00	
	ATVs	$695.00	
	Field Supplies	$947.00	
	Salary - [redacted]	$9,700.00	
		$3,200.00	
	Laboratory analyses IOS	$8,010.59	
			$26,792.59
Ground Magnetic & Gravity Survey			
	Travel and Accommodation	$1,194.30	
	Rental of Gravity Meter	$1,100.00	
	Rental of magnetometers	$2,121.00	
	ATVs	$280.00	
	Salary [redacted]	$6,000.00	
		$3,000.00	
			$13,695.30
Report Writing			$740.00
Overhead			$2,200.00
	Total		**$43,427.89**

5.5 DISTRIBUTION OF ASSESSMENT CREDITS

Portions of Permit 9301020023 to be retained:

4-12-055	22	640 acres	
	North Portion 26	80 acres	estimate
	Northwest Portion 27	30 acres	estimate
	28	640 acres	
	Portion 33	100 acres	estimate
	34	640 acres	
	Portion 35	30 acres	estimate
	Total	2,160 acres	approximately

R 12 W4



T
55

NEW CLAYMORE
RESOURCES LTD

DUVERNAY ALBERTA
Permit 9301020023
AREA TO BE RETAINED
Figure 6
June 10, 2003

Apply eight years to these 'retained' lands in Permit 9301020023

Work to:	February 26, 2003	2,160 x $2	$ 4,320
	January 15, 2005	2,160 x $4	8,640
	January 15, 2007	2,160 x $4	8,640
	January 15, 2009	2,160 x $6	12,960
			$34,560
	Excess credit		8,867
		Total	$43,427

The above numbers will need be corrected when the exact areas of the portions are known.

6. CONCLUSIONS AND RECOMMENDATIONS

The St Paul area exhibits the best diamond indicator geochemistry in Alberta. Unfortunately, simple magnetics have done little to show any source of the geochem. The only other obvious tool to employ is seismic. However, New Claymore has tried for years to source the abundant seismic in the hands of oil and gas companies, but to little avail.

7. REFERENCES

Dufresne, M.B., Eccles, D.R., McKinstry, B., Schmitt, D.R., Fenton, M.M., Pawlowicz, J.G., and Edwards, W.A.D. (1996) The diamond potential of Alberta; Alberta Geological Survey Bulletin No. 63, 97 p., 33 figs., 5 appendices.

Mossop, G.D. and Stetsen, I. (eds.) (1994) Geological Atlas of the Western Canada Sedimentary Basin. Published jointly by The Canadian Society of Petroleum Geologists and The Alberta Research Council, 510 p.

DECLARATION:

I, Anthony Rich of the City of Edmonton in the Province of Alberta, state that I am the President of New Claymore Resources Ltd. and

HEREBY DECLARE THAT that the costs detailed in my report of June 10th, 2003 on the St Paul Permits are the true and correct costs associated with exploration therein described and are true and accurate and as incurred and paid for by New Claymore Resources Ltd.

Dated at Edmonton, this 12th day of June, 2003.

[redacted]

Anthony Rich
New Claymore Resources Ltd.

SWORN before me in the City of Edmonton this 12th day of June, 2003

Notary Public for the Province of Alberta
ANNE S. de VILLARS, Q.C.

CERTIFICATE

I, Anthony Rich of Edmonton Alberta declare and certify that:

1. I graduated from the University of Alberta with a B.Sc. in Geophysics in 1966.

2. I was accepted as a member of A.P.E.G.G.A , the Association Of Professional Engineers, Geologists and Geophysicists of Alberta, in 1969 as a Professional Geologist.

3. I have worked in mineral exploration since 1964.

   This report is based on personal knowledge of the St. Paul Property.

4. I have been President of New Claymore Resources Ltd. since incorporation in 1970.

Respectfully Submitted this 10th day of June, 2003

Anthony Rich, P.Geol.

APPENDICES

IOS 01-1.jpg (1084x1437x16M jpeg)

HEAVY MINERAL EXAMINATION FROM 14 SAND BEACH SAMPLES

NORTHERN ALBERTA

présenté à
Mr. ROBERT RYSIUK
NEWCLAYMORE RESOURCES INC

by
Réjean GIRARD

IOS Services Géoscientifiques Inc.

Your project number: #
Our project number: 01-339

Jonquière

14 August 2001

HEAVY MINERAL FROM BEACH SANDS
NORTHERN ALBERTA

INTRODUCTION

A set of 14 samples of sand were submitted to our attention in order to extract heavy minerals for kimberlitic indicators. The samples were naturally enriched in heavy mineral, including abundant garnet. According to the client, there is no obvious source rock for such garnet.

SAMPLES DESCRIPTION

The samples were collected from sandy beaches and were naturally well sorted and enriched in heavy minerals (***Photo 1***). Sampling sites location are not known to the authors. Samples were received in 12 liters pails to our facilities. Samples were wet, clean and received in good standing order.

HEAVY MINERAL FROM BEACH SANDS
NORTHERN ALBERTA

HEAVY MINERALS SEPARATION PROCEDURE

Wet seiving

Samples were sieved as received in a standard sieves at 1000 microns under a water spray. Smaller than 1000 microns material was recovered through settling in a tub. No calgon soaking has been required. All fractions were weighted and recorded. Material above 1000 microns was discarded.

Shaking table preconcentration

The 0-1000 micron fraction has been processed on a shaking table. The model used is derived from a Wilfley table, with a custom built deck out of a plexiglass sheet. The feed has been processed twice in order to recover an heavy mineral preconcentrate, a reject which has been discarded, and a medling which has been stored.

Dry sieving

The dried table preconcentrate has been seived dry at 250 microns. The fines were stored while the 250-1000 micron fractions has been sent to heavy liquid separation, up to 500 grams

Heavy liquids

The heavy mineral preconcentrate has been submitted to heavy liquid in Chimitec facilities in Val d'or. Methylene Iodide has been used with a density of 3.3 g/cc.

Acid wash

The recovered heavy minerals were the boiled gently with hydrochloric acid 10% for 5 minutes. This step is done in order to get rid of coating and crust recovering them. Very little corrosion is usually observed upon sulfides mineral.

Hand magnet separation

Magnetite and other ferromagnetic mineral are removed from the concentrate with an hand magnet. Lot of care is apply to this step since any trace of magnetite will tend to clog the Frantz separator.

HEAVY MINERAL FROM BEACH SANDS
NORTHERN ALBERTA

Frantz magnetic separation

The non-ferromagnetic heavy mineral are then splitted into various fractions based on their apparent magnetic susceptibility with a Frantz field barrier magnetic separator. Forward and slope angles were set at 15°, and passes done at diverse currents. This separation is tricky but allows to efficiently separate the pyrope from the bulk of the common garnet. It was an essential process on this project since the sample were loaded with common garnet. It has prove to be efficient.

Visual examination

Visual examination of the concentrate were carried under a polarizing stereomicroscope by two geologists, Mme Natacha Fournier and Mme Sanmei Gao. Only the diamagnetic fractions, the least paramagnetic fractions and the most paramagnetic fraction were examined. The paramagnetic fractions hosting the bulk of the garnet were not examined, due to their large weight. Selected minerals were extracted and stored in small vials.

Mineral mounting

Grains selected by the pickers were reselected by Mme Lucie Tremblay prior to be mounted for probing. Grains to be probed were mounted on a glued glass plate, and freeze in epoxyde. The epoxyde mount is then cut, polished and carbon coated for probing.

Microprobe analysis

Upon the client request, a total of 174 garnets, 69 of them being visually identified as pyrope, were analyzed with the microprobe. The microprobe used is based at Laval University, and is a Cameca SX-100 built in 1998. This machine is equipped with five variable wave length dispersive spectrometers, and is totally automated from a Unix based computer. It has proven as being extremely stable allowing very reproductible results and very low detection limits.

RESULTS

A large number of kimberlitic indicators were found in these samples. Only the pyropic garnet were probed, and thus certified as kimberlitic indicators. Picroilménite, Cr-diopside and chromite are subjected only to visual

identification and cannot be certified as kimberltic for the moment. These are listed in table 1.

Table 1: Kimberlite indicator mineral counts

Sample ID	*Pyrope*	*Cr-Diop*	*Chromite*	*Ilmenite*	*Total*
0001	*5 (4)*	*0*	*0*	*0*	*5*
0002	*1 (1)*	*2*	*3*	*0*	*6*
0003	*1 (1)*	*0*	*3*	*0*	*4*
0004	*2 (1)*	*1*	*0*	*1*	*4*
0005	*2 (2)*	*1*	*3*	*0*	*6*
0006	*2 (1)*	*0*	*5*	*0*	*7*
0007	*1 (4)*	*3*	*11*	*0*	*15*
0008	*3 (2)*	*4*	*1*	*0*	*8*
0009	*0 (0)*	*0*	*0*	*0*	*0*
0010	*5 (8)*	*4*	*1*	*1*	*11*
0011	*9 (10)*	*4*	*3*	*0*	*16*
0012	*0 (0)*	*0*	*7*	*0*	*7*
0013	*2 (7)*	*2*	*8*	*1*	*13*
0014	*21 (20)*	*15*	*6*	*0*	*42*
Total	***54 (61)***	***36***	***51***	***3***	***144***

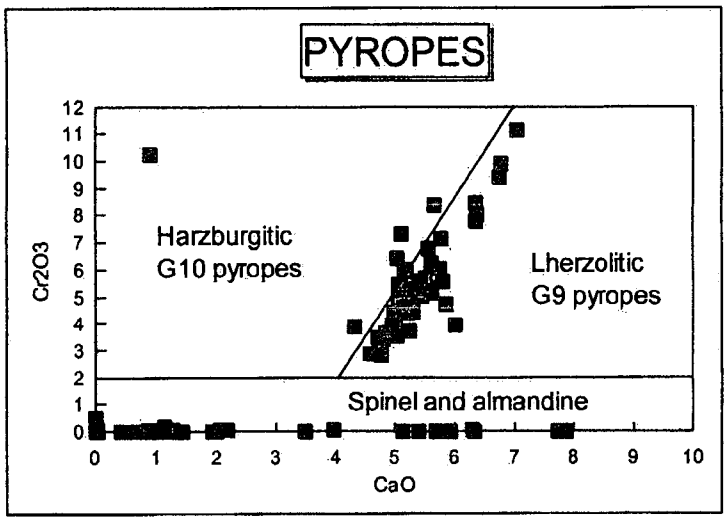
Pyrope are microprobe count, visual count being in parenthesis. All other KIM are visual count.

Pyropes are rather abundant, up to 21 counts in sample #14. Such a count in highly abnormal, despite of the natural preconcentration in beach sand. This count is supported by 15 Cr-diopside and 6 chromite, which yeild a total count of 42 indicators. Although these indicators come from beach sands, some of them did show very little attrition. Subkelyphitic textures were locally preserved, as well as sharp shard, delicate titanomagnetite rims on ilmenite, delicate Cr-diopside, etc. Although the spatial relationship between the samples are unknown to the authors, these results should be taken very seriously.

Plotted on the standard Cr_2O_3-CaO scattergram, the pyrope indicate a moderate J score, with 1 obvious low-calcium harzbrugitic G10 garnet only, versus abundant lherzolitic G9 and high-Ca G10 garnet.

IOS 01-6.jpg (2080x3088x256 jpeg)

HEAVY MINERAL FROM BEACH SANDS
NORTHERN ALBERTA



Other minerals of interest were reported. Chalcopyrite and azurite has been recovered out of sample #5, #10 and #14. Pyrite can be rather abundant in some sample, #5, #12 and #13. Dumorthierite, a boron sorosilicate typically associated with mesothermal gold, has been found in sample #1, #4, #5 #10. Spinels of various shades, including abundant purple or burbon, are ubiquitous.

Discriminating between purple spinel and pyrope has prove to be a tricky task, both spicies being visually very similar: same color range, same luster, same anisotropy, similar density, same magnetic susceptibility range, etc. Therefore grains originally identified as pyrope turned to be spinel when analyzed with microprobe, and vice-versa. Since some samples were basically flooded of spinel, some pyrope were likely missed.

Finally, garnet is very abundant out of some sample, enough to consider their value as industrial commodity. Fine grain garnet does have a market as abrasive for sand blasting.

The bulk of the heavy minerals found in these sample shows a typical signature of sheild area. As these samples were apparently taken from an area of mesozoic sedimentary cover, the heavy mineral assemblage represent an unexpected source.

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CERTIFICATION

I, hereafter signed, Réjean Girard, professional geologist working for IOS Services Géoscientifiques Inc., certify that:

- I am professional geologist having graduated from Laval University, Ste-Foy, in 1985.

- I am living in Laterrière, Québec

- I have worked as a geologist on a full time basis since 1985.

- I worked as geologist, either on contract or as seasonal staff, from 1985 to 1993 with the Quebec Department of Natural Resources, the Geological survey of Canada, the Geological Survey of Norway as well as divers exploration companies.

- I am a senior geologist with IOS Services Géoscientifiques Inc. since 1992.

- I do not own nor intend to acquire any securities nor indirect interest in Newclaymore Resources Inc. nor any of their partners or potential investors.

- I did this work with the best of my knowledge and scientific wisdom.

- All the results here presented are complete and unbiased.

[redacted]

Réjean Girard, géologue

HEAVY MINERALS STUDY
FROM SAND BEACH, ALBERTA

Presented to
Mr BOB RYZIUK
NEW-CLAYMORE RESSOURCES LTD

By
Lucie TREMBLAY
Réjean GIRARD

IOS Services Géoscientifiques Inc.

Your number project:
Notre numéro de projet: 02-339

Jonquière 28 June 2002

HEAVY MINERAL STUDY
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INTRODUCTION

A total of 18 samples have been submitted to our attention for heavy mineral process for kimberlitic indicator.

The location of these is not known from the author. The author was not involved in sampling nor target selection. All sample were sand beach collected in Alberta.

Samples were trucked to IOS facilities in Jonquière. The first set of sample comprised 14 samples received the 23th of May 2001. The other set comprised 4 samples received during fall 2001. All of them were sealed in plastic pails. Non of them were damaged. The average wet weight was 23 kg for the first 14 samples and 11 kg for the 4 last ones.

A first report was done on august 2001 with results of garnet microprobe analysis on the first set of 14 samples. Abundance of pyropes was then established, although the population analysed was not sufficient to confidently characterised the fertility of source rock. Therefore, a second processing has been carried in order to increase the pyrope population to about 100 analysis, plus to get some information about diopside, chromite and ilmenite. The present report regroups data of all samples.

SAMPLE PROCESSING

Wet sieving

Samples 1 to 14

Samples were sieved as received in a stack of standard sieves at 1000 microns under a water spray. Smaller than 1000 microns material was recovered through settling in a tub. All fractions were weighted and recorded. Material above 1000 microns was discarded. No aliquot of the original sample has been saved, except for one sample (2001-B-001).

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Samples 14 to 18

These were sieved at 1000 and 2360 microns under a water spray. Material above 2.36mm was discarded. All fractions were weighted and recorded.

Shaking table preconcentration

The 0-1000 micron fraction has been processed on a shaking table. The model used is derived from a Wilfley table, with a custom built deck out of a Plexiglas sheet. The feed has been processed with multiple passes in order to recover an heavy mineral preconcentrate, a reject which has been discarded, and a meddling which has been dried and stored.

Dry sieving

The dried table preconcentrate has been sieved dry at 250 microns. The fines were stored while the 250-1000 microns fractions was sent to acid wash to Chimitec facilities in Val d'or.

Samples which have excess of weight were sent first partially (around 450g). These are 2001-B-001, 010, 15 and 16. The rest of sample were sent later.

Acid wash

The 250-1000µ preconcentrate was soaked in hot hydrochlorid acid in order to remove the ferric coating upon the grains. No corrosion is usually observed upon sulphides mineral nor upon silicates.

Heavy liquids

Up to 450 grams per sample of clean preconcentrate was submitted to heavy liquid in Chimitec facilities in Val d'Or. Methylene iodide was used with a density of 3.3 g/cc. Heavy mineral concentrates are washed in acetone, dried and returned to our facilities. Lights minerals are stored for 3 months in Chimitec facilities.

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Sample having excess of weight were sent in two set. A first 450g of preconcentrate were then submit for samples 2001-B-001, 010, 14 and 16. The second set was sent later (see appendix 1, Excess of weight sample). The weight of the heavies vary from 0.9 to 468 g.

Hand magnet separation

Magnetite and other ferromagnetic minerals are removed from the concentrate with an hand magnet. Lot of care is apply to this step since any trace of magnetite will tend to clog the Frantz separator.

Frantz magnetic separation

The non-ferromagnetic heavy minerals were then split into various fractions based on their apparent magnetic susceptibility with a Frantz field barrier magnetic separator. Forward and slope angles were set at 15°, and passes done at diverse currents. This separation is tricky but allows to efficiently separate the pyrope from the bulk of the common garnet.

Results of sample processing are provided in **appendix 1.**

Visual examination

Visual examination of the concentrate were carried under a polarizing stereomicroscope by Mme Natacha Fournier and Sanmei Gao, geologists. Selected minerals were extracted and stored in small vials. In general, non- ferromagnetic fractions 0.1, 0.25, 0.4, 1.0 and >1.0A were examined under microscope. The 0.17A were not examined except for few sample. This fraction is collecting almandine garnet, very abundant in these samples. Some samples from 0.1A fraction were not analysed neither according the size of the fraction. The processed fraction of each sample is shown in shade area in *appendix 1* (Frantz Magnetic Separator).

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All samples from fine fraction (250-1000um) have been examined under microscope. Coarse fraction (1-2.36 mm) for samples 2001-B-15 to 18 have also been examined. Results of visual examination are provided in **appendix 2**.

Mineral mounting

Grains selected by the pickers were re-examined by the author. Significant grains were then mounted upon a glued glass plate, indexed and moulded into epoxy. The epoxy bead is then engraved, polished to 2µ and carbon coated for microprobe analysis.

Scanning electron microscope identification

Unknown mineral species as well as a few grains of interest for base metal exploration were extracted for scanning electron microscope identification. For such, they are mounted and indexed upon a glued glass plate, and coated with gold-palladium nanofilm. They were studied with the Jeol-840A microscope, run at the Laboratoire de microanalyse de l'Université Laval. They were analysed with the use of EDS analyser, the spectrum being visually interpreted by the author. Results are provided in **appendix 3**.

MICROPROBE ANALYSIS

Grains suspected to be indicator minerals are indexed and mounted upon a glued glass plate. They are then embedded in a epoxy mount, which is polished to 2µ and carbon coated. The analysis are carried with the 1998 Cameca SX-100 based at the Laboratoire de microanalyse de l'Université Laval. This machine is Sun-based, equipped with 5 variable multi-crystal wave-length dispersion spectrometers, EDS analyser, etc. Analytical routine for indicator were established 4 years ago for IOS. Setting and detailed procedures are provided in **appendix 4**. Grains were analysed in two time. The first batch were analysed the 6th of August 2001 and the second batch the 22th of March 2002. The number of selected grains are resume in ***table 1***.

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Table 1: Summary of grains analysed

Mineral	*# Grain*	*Date*
Garnet	174	August 6, 2001
Garnet	134	March 22, 2002
Oxides	102	March 22, 2002
Pyroxene	78	March 22, 2002

Calibration are performed upon pure oxides, and checked upon standard minerals. Different calculation routine (labels) are available for garnet, pyroxene, ilmenite and spinel stoichiometry. Concerning oxydes, visual examination do not always provide correct identification, leading to the use of wrong label. Then, the ferric-ferrous iron ratio, calculated according to label stoichiometry, may be wrong (if spinel are analysed with ilmenite label and vice-versa). So, iron need to be calculated as total ferrous, and recasted according to the correct stoichiometry by the author. As an ilmenite label was used by the microprobe software, spinel (chromite) stoichiometry has been recasted.

Recasted and indexed analysis are listed in **appendix 5**, along with mineral interpretation.
Microprobe analysis certificate (microprobe print-out) are provided in **appendix 6** along with microprobe settings.

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RESULTS INTERPRETATIONS

The result of microprobe analysis for KIM's are present in table 2.

Table 2: Count of mineral indicator

Sample	G9*	G10*	Picroilmenite	Chromite	Cr-spinel	Cr-diopside**	Low Cr-Diopside***	Total
1	4	2		1	2		4	20
2	1		n/a	n/a	n/a	n/a	n/a	2
3	1		n/a	n/a	n/a	n/a	n/a	2
4	2		n/a	n/a	n/a	n/a	n/a	4
5	1	1	n/a	n/a	n/a	n/a	n/a	4
6	1		n/a	n/a	n/a	n/a	n/a	3
7		1	n/a	n/a	n/a	n/a	n/a	2
8	2	1	n/a	n/a	n/a	n/a	n/a	6
9			n/a	n/a	n/a	n/a	n/a	0
10	14	1			2	7	3	46
11	4	3	n/a	n/a	n/a	n/a	n/a	16
12			n/a	n/a	n/a	n/a	n/a	0
13	1		n/a	n/a	n/a	n/a	n/a	3
14	9	4		1		4	3	43
15		1				5	2	9
16	7	8	4			4	3	50
17	1		2	1		4	2	11
18	3	3				2		18
Total	51	25	6	3	4	26	17	239

*According to Dawson and Stephen classification

** >0.8% Cr2O3

*** 0.5%<Cr2O3>0.8%

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1	4	2		1	2		4	20
2	1		n/a	n/a	n/a	n/a	n/a	2
3	1		n/a	n/a	n/a	n/a	n/a	2
4	2		n/a	n/a	n/a	n/a	n/a	4
5	1	1	n/a	n/a	n/a	n/a	n/a	4
6	1		n/a	n/a	n/a	n/a	n/a	3
7		1	n/a	n/a	n/a	n/a	n/a	2
8	2	1	n/a	n/a	n/a	n/a	n/a	6
9			n/a	n/a	n/a	n/a	n/a	0
10	14	1			2	7	3	46
11	4	3	n/a	n/a	n/a	n/a	n/a	16
12			n/a	n/a	n/a	n/a	n/a	0
13	1		n/a	n/a	n/a	n/a	n/a	3
14	9	4		1		4	3	43
15		1				5	2	9
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Garnets

A total of 308 grains were analysed to verified the presence of pyrope. Several grains suspected as spinel were also analysed, since these have the same habit than pyrope, being rounded, mauve and isotropic. After results, a total of 107 pyropes, 107 spinel, and 193 common garnet have been probe.

Many pyropes are rounded. Some show typical subkelyphitic corrosion textures, some are either resorbed, frosted or corroded. No one had a rim of kelyphite.

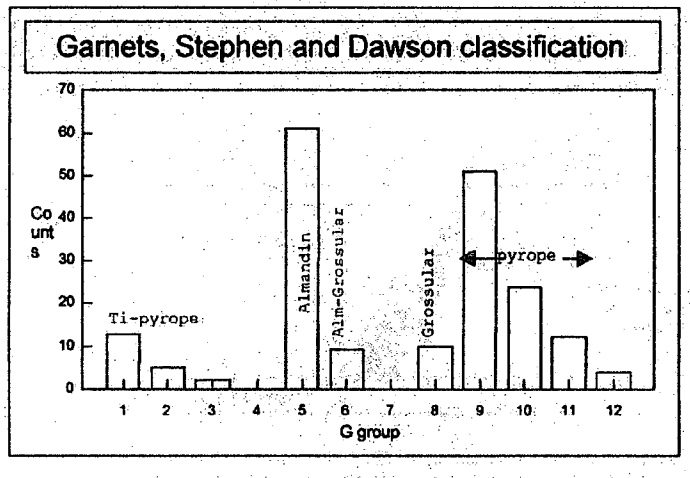

Fig 1: Dawson and Stephen classification of garnet.

When processed with the Dawson and Stephen cluster analysis algorithm, most pyrope class as G9 to G11 chromian pyropes. G1 and G2 titanian pyrope are also present, less abundant. Garnet from other class are present, likely crustal derived garnet, such as G5, G6 and G8.

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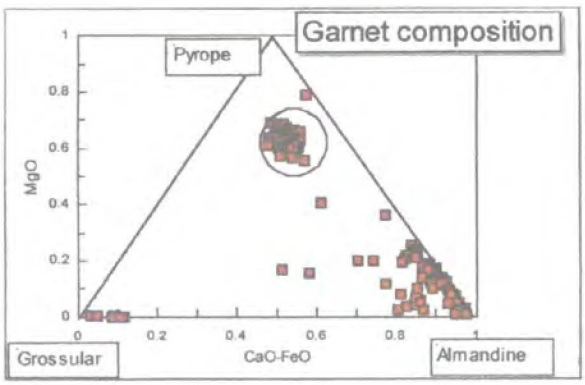

Fig 2: Composition of garnet extracted from all samples. Note the tight cluster of pyropic composition.

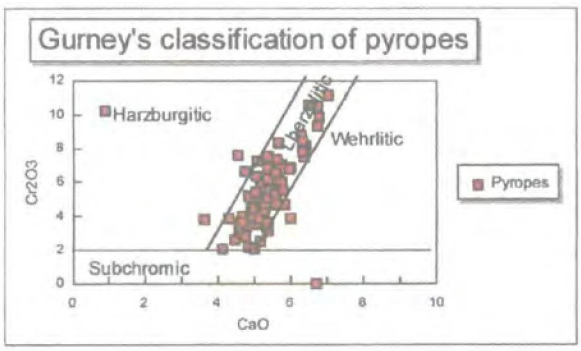

Fig 3: Gurney's classification of pyropes. Note that harzburgitic field is usually referred as *G10* and that *lherzolitic* field is usually referred as *G9*[1] in the industry. Only garnet in excess of 14% MgO were plotted.

[1] This classification do not fit the original Dawson and Stephen cluster analysis.

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In the Gurney classification of pyrope, used as a standard in industry, most pyrope project along the lherzolitic field, usually refered as *G9*. Only one grain (sample 001) project in the significant harzburgitic field, usually refered as *G10*. This one is over 10% Cr2O3 with low calcium, which yeild a high J-factor. In the Dawson and Stephen classification, the lherzolitic pyrope of the present population class as either G9, G10 or G11, according to chromium level.

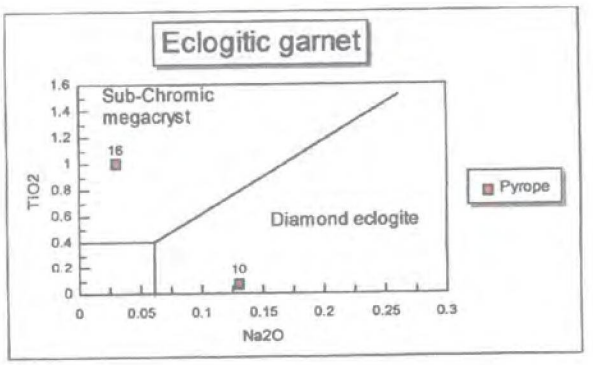

Fig 4: Shultz classification of pyropes according to incompatible element content. Only garnet with more than 14% MgO and <2% Cr2O3 were plotted.

On the Schulz diagram used to discriminate significant eclogitic garnet, only one pyrope plot in the significant field of diamond bearing eclogite. This one is sample #10, characterise as G3 in the Dawson and Stephen classification. The other(sample #16) falls into the sub-chromic megacryst field.

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DIOPSIDE

The Cr-Diopside were picked and analysed for samples #1, 10, 14 to 18 only. Most of them have composition rather pure, close to the diopside end-member (**fig.5**). The Mg# is not in excess of 90% for most grain which would have been typical of mantle derived peridotite source. Some grains show a calcium (wollastonite) depletion toward tremolite, which could be a deuteric alteration upon a diopside.

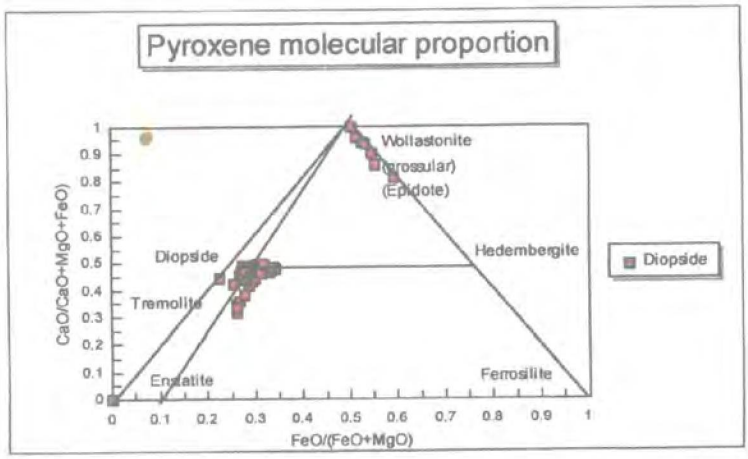

Fig 5: Molecular proportion of pyroxene end-member.

Most of the diopside are not significantly chromian (**fig. 6**), which was suspected as their tint is not utmostly vivid. The chromium content of diopside megacryst is reported to vary widely among different intrusion, and some are well documented as having essentially chromium poor pyroxene.

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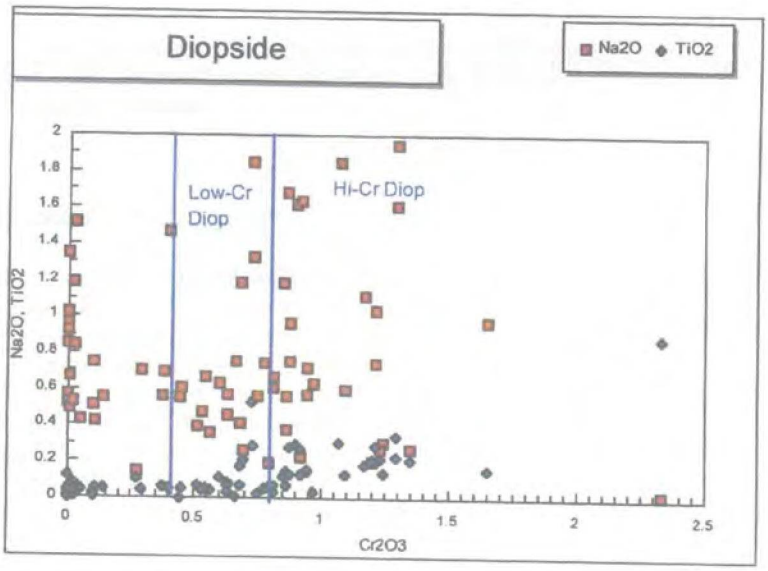

Fig 6: Trace element contents in diopside.

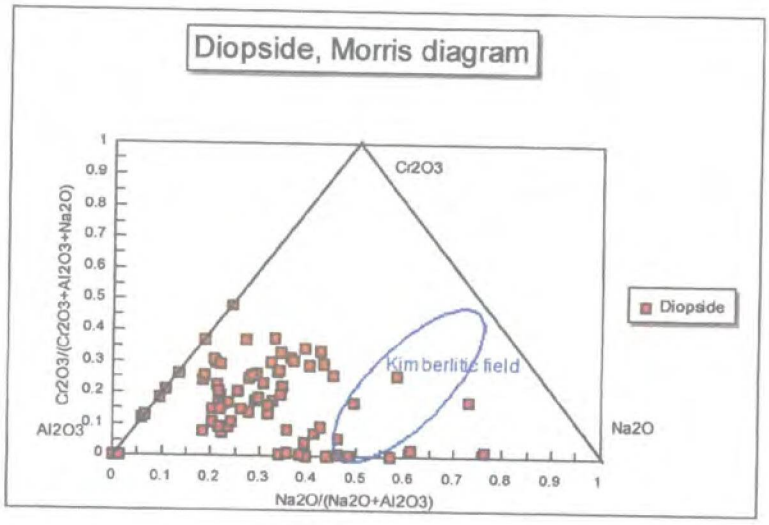

Fig 7: Morris diagram for diopside, suggesting a few grains of deep mantle origin, suspected as kimberlitic megacryst.

In the Morris diagram (fig.7) to discriminate origin of diopside, some grains plot within the kimberlitic or deep mantle derived field.

Picroilmenite

Only grains from samples #1, 10, 14 to 18 were picked and analysed. Six picroilmenites were analysed, 4 in sample #16 and 2 in sample #17. No Cr-picroilmenite were analysed. Some had corroded surface, some were resorbed.

On the Fe-Mn-Mg end-member diagram (**fig. 8**), most grains plot in the ilmenite ($FeTiO_3$) pole. Some extended along geikielite ($MgTiO_3$) -ilmenite tie line, which is typical of megacrystic kimberlite derived ilmenite. No pyrophanite ($MnTiO_3$) molecule is present, such as in most alkaline magmas.

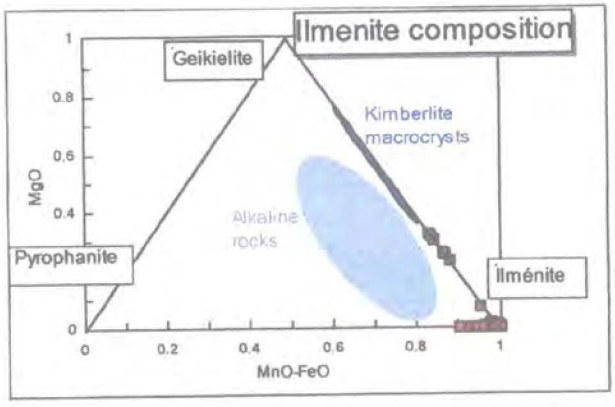

Fig 8: Fe-Mg-Mn endmember composition of ilmenite.

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The picroilmenite composition is sensitive to oxygen fugacity prevailing during its growth. Lower is such fugacity, higher is the ilmenite content ($Fe^{++}TiO_3$). On the hematite-ilmenite-geikielite end-member diagram (**fig. 9**), the picroilmenite plot in a restricted field close to pseudobrookite exsolution gap. This field correspond to typical kimberlitic ilmenite macrocryst. Kimberlitic groundmass ilmenite usually project themselves closer to the geikielite endmember. Common ilmenite typically plot along the hematite-ilmenite tie-line, including the bulk of picked grains.

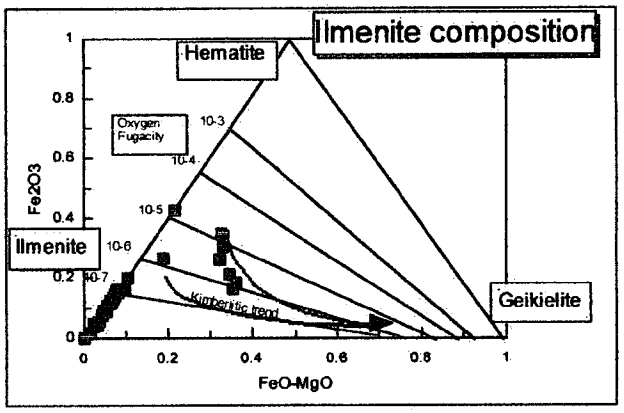

Fig 9: Endmember diagram for ilmenite. The blue lines are isopleth of oxygen fugacity, the digit beside being partial pressure in 10^{-x} atm. The pseudobrookite immisibility gap is indicated. Six grains project in the kimberlitic macrocryst field.

The industry standard discriminating diagram shows chromia versus magnesia (**fig. 10**). The chromian content is usually considered as sensitive to oxygen fugacity, with high chromian high magnesium content indicative of reducing conditions. Chromium rich picroilmenite are typically

considered as being restricted to kimberlitic origin. Althoug rich in magnesium, these grains are not significantly enriched in chromium.

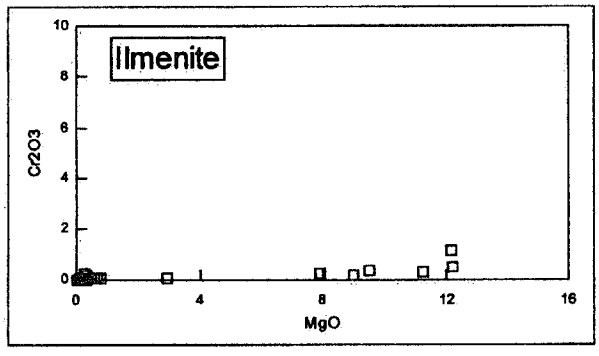

Fig 10: Industry standard diagram for ilmenite showing the 6 chrome poor picroilmenite.

Chromite

Chromite were seldom in the samples, only few grains being recovered from samples picked (#1, #10, #14 to 18). Only three grains of chromite lie along the picotite trend, the others are chromian spinel without meaning. None of them plot in the typical kimberlite field (**fig. 13**).

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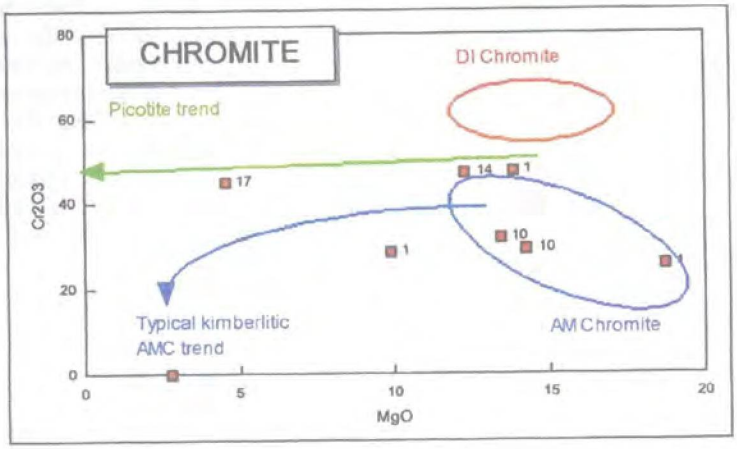

Fig 13: Diagram to characterise chromite.

AM Chromite: Aluminomagnesian chromite
DI Chromite: Diamond inclusion chromite
Picotite: Tholeitic chromite

CONCLUSIONS

A total of 239 indicator minerals were extracted from samples #1 to 18 including 107 pyropes. Pyrope were extracted from all samples while oxides and diopside were picked from samples 1, 10, 14 to 18 only.

Samples #10, 14, 16, 18 and 1 are the most significative with pyrope count up to 24 for sample #16. According to Dawson and Stephen classification, samples containing G10 are #1, 5,7,10,11, 15 and 16. According to Gurney's classification, pyrope from sample #1 is the most interesting, being located within the harzburgitic field the other being inside or near the lherzolitic field. None had a kelyphitic rim suggesting a near source inclusion. Many grains were rounded. The analysed pyrope population is sufficently large to propertly estimate the statistical significance. The harburgitic/lherzolitic pyrope ratio is

rather small, with <1%. Usually, a ratio of >10% is required by the industry. However, the richness in Cr2O3 for the harzburgite pyrope is relevant, as well as the occurrence of a diamondiferous-eclogitic garnet. The reader shall be aware that the Attawapiscat pipes in Northern Ontario, which are presently under feasibility study, do not host any harzburgitic pyrope. The evaluation of pyropes significance has been carried by De Beers using trace elements, according to proprietary technic.

Six(6) chrome poor picroilmenites were found in samples #16 and #17. Three chromites were found but none of them plot within the diamond field inclusion. Analysed population of oxide is too small to draw rigid conclusions.

[redacted]

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